EXECUTIVE SUMMARY

INTRODUCTION

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

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

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

PROJECT LOCATION AND DESCRIPTION

On November 28, 2001, Palomar Energy LLC (Palomar) filed an Application for Certification (AFC), for its proposed Palomar Energy project (PEP) with the California Energy Commission seeking approval to construct and operate a 500 megawatt (MW) natural gas-fired, combined-cycle electric generating facility. The plant will be owned and operated by Palomar. The Energy Commission determined the application to be data adequate on February 6, 2002. This determination initiated staff's independent analysis of the proposed project.

While Palomar's AFC states that the facility will have a nominal electrical output of 500 MW, this nominal rating is based upon base load operation, preliminary design information, and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure. As stated in staff's Efficiency analysis in this PSA, staff believes the actual peak electric output of the facility, as proposed, is 546 MW net.

The PEP will consist of a natural gas-fired combined cycle power plant, associated reclaimed water supply and brine return pipelines, and a project switchyard that will connect to the adjacent 230 kV San Diego Gas and Electric (SDG&E) transmission line.

The PEP equipment includes two General Electric (GE) Frame 7-FA combustion gas turbines with evaporative inlet air coolers/filters, two multi-pressure heat recovery steam generators (HRSGs) with duct burners, and a single three-pressure, reheat, condensing steam turbine (ST) generator producing a maximum of 229 MW, arranged in a two-on-one combined cycle train.

The PEP would be located on a vacant 20-acre site within a proposed 186-acre industrial park in the City of Escondido, San Diego County, California. The industrial park project is known as the Escondido Research and Technology Center (ERTC). **PROJECT DESCRIPTION Figure 1** shows the regional setting for the proposed project. The project site is located west of Interstate 15 and south of State Highway 78, about 600 feet southwest of the intersection of Vineyard Avenue and Enterprise Street. **PROJECT DESCRIPTION Figure 2** provides the local setting for the proposed project. **PROJECT DESCRIPTION Figure 3** shows the eight proposed ERTC planning areas. The PEP would be located on Planning Area 1 within the ERTC.

Reclaimed water for the project will be supplied from the City of Escondido's Hale Avenue Resource Recovery Facility (HARRF) via a new 1.1- mile, 16-inch supply pipeline extending from an existing reclaimed water main. The route of the reclaimed water supply pipeline is illustrated on **PROJECT DESCRIPTION Figure 2**. The small quantity of potable water required by the project will be provided by Rincon del Diablo Municipal Water District via the potable water system proposed to serve the ERTC.

To control emissions of air pollutants, PEP's CTGs and HRSGs will be equipped with dry low nitrogen oxide (NOx) combustors, selective catalytic reduction and an oxidation catalyst.

Power will be generated at 18 kV by the two CTGs and ST, and then stepped up to 230 kV for delivery to the power plant's interconnection with SDG&E. The 230 kV side of each step-up transformer is connected to a 230 kV ring bus switchyard. The switchyard is directly connected with the SDG&E transmission system via a loop-in of the existing 230 kV Escondido-Sycamore Canyon transmission line which runs along the western boundary of the project site. Because the 230 kV ring bus switchyard is directly connected to the existing SDG&E transmission line, the PEP will not require the construction of any new transmission lines.

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

ESCONDIDO RESEARCH AND TECHNOLOGY CENTER REVIEW

The PEP would be located on Planning Area 1 of the proposed Escondido Research and Technology Center (ERTC) project. The ERTC project and a draft Specific Plan for the ERTC are currently undergoing land use permitting and California Environmental

Quality Act (CEQA) reviews, with the City of Escondido (City) as Lead Agency. The City released a draft Environmental Impact Report (EIR) on July 26, 2002. Energy Commission staff are currently reviewing the draft EIR and will provide comments to the City in early September. The City's Planning Commission and City Council are expected to consider a final EIR for the project in early October. A decision on the ERTC Specific Plan is expected in November.

The City and the Energy Commission staff have executed a Memorandum of Understanding to coordinate the environmental and permitting reviews of the PEP and the ERTC Specific Plan. The ERTC Specific Plan includes modifications necessary for the PEP to comply with local laws, ordinances, regulations and standards (LORS). Construction of the PEP is also physically dependent on the grading for the overall ERTC site. For these reasons, the approval of the PEP by the Energy Commission cannot occur until the City completes its EIR process and approves the ERTC project and specific plan.

PUBLIC AND AGENCY COORDINATION

The Energy Commission's PEP Committee conducted an Informational Hearing and Site Visit on March 21, 2002. This hearing provided a forum for the public to learn about the project, the Energy Commission's process, and to raise their questions and concerns about the proposed power plant.

As stated above, staff is working with the City of Escondido to coordinate the review of the PEP with the City's CEQA review of the ERTC.

Staff has also coordinated their review with relevant local, state and federal agencies, such as the California Independent System Operator, the San Diego County Air Pollution Control District (SDAPCD), the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the California Department of Fish and Game. This PSA provides agencies and the public the opportunity to review the Energy Commission staff's analysis of the proposed project.

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

STAFF'S ASSESSMENT

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

- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- environmental impacts, and measures proposed to mitigate these impacts;

- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project closure;
- project alternatives; and
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation.

OVERVIEW OF STAFF'S CONCLUSIONS

Environmental / System Impacts and LORS

Staff's preliminary analysis indicates that, with the exception of Air Quality, Biological Resources, and Transmission System Engineering, the project's environmental impacts can be mitigated to levels of less than significant, and that the project can be made to conform with all applicable LORS. Below is a table summarizing the potential environmental impacts and LORS compliance for each technical area. Air Quality, Biological Resources, and Transmission System Engineering are discussed in more detail following the table.

Technical Discipline	Environmental / System Impact	LORS Conformance
Air Quality	Staff cannot conclude	Requires complete offset package
Biological Resources	Staff cannot conclude	Requires mitigation agreement
Cultural Resources	Impacts mitigated	Yes
Power Plant Efficiency	No impact	N/A
Power Plant Reliability	No impact	N/A
Facility Design	N/A	Yes
Geology	Impacts mitigated	Yes
Hazardous Materials	Impacts mitigated	Yes
Land Use	Impacts mitigated	Yes[1]
Noise	Impacts mitigated	Yes
Public Health	Impacts mitigated	Yes
Socioeconomics	Impacts mitigated	Yes
Traffic and Transportation	Impacts mitigated	Yes
Transmission Line Safety	No Impact	Yes
Transmission System Engineering	Staff cannot conclude	Requires additional information
Visual Resources	Impacts mitigated	Yes
Waste Management	Impacts mitigated	Yes
Water and Soils	Impacts mitigated	Yes
Worker Safety	Impacts mitigated	Yes

[1] This assumes approval of the ERTC Specific Plan by the City of Escondido.

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

Air Quality

- The applicant does not currently have a complete offset package for ozone precursors that satisfies routine SDAPCD permitting requirements and the Energy Commission staff's requirements for CEQA mitigation (see **AIR QUALITY Table 17**).
- The task of creating emission reduction credits and acquiring them is time consuming and especially competitive in the San Diego region, which leads staff to be concerned that the applicant may not be able to comply with the requirements in a timely manner. Because the offset packages are still incomplete, staff, the U.S. Environmental Protection Agency (U.S. EPA), and the public cannot review or comment on the complete strategy at this time. Therefore, and staff cannot determine whether the Palomar Energy Project is in compliance with the SDAPCD offset rules.
- The Best Available Control Technology (BACT) determination of the SDAPCD's Preliminary Determination of Compliance (PDOC) appears to be inconsistent with recent U.S. EPA guidance that identified more stringent nitrogen oxide (NOx) and carbon monoxide (CO) levels as being demonstrated in practice while achieving lower levels of ammonia slip. The U.S. EPA is expected to provide comment on the BACT decision of the PDOC. Until U.S. EPA participation occurs, staff cannot determine if the Palomar Energy Project is in compliance with the SDAPCD requirements for BACT.
- Based on the information available at this time, significant impacts related to ozone and particulate matter less than 10 microns in diameter (PM_{10}) remain unmitigated. Staff does not have enough information to determine the adequacy of the applicant's proposed "mitigation fee" as a viable strategy for reducing PM_{10} impacts. As such, the applicant must provide additional mitigation recommended by staff in this PSA, or develop an appropriate alternative strategy.

Biological Resources

In this PSA staff identifies the need to resolve biological resources issues relating to the:

- number of acres of habit impacted by the proposed project;
- impacts to sensitive species;
- impacts on wildlife movement corridors; and
- habitat compensation for direct impact of ERTC development.

Staff will work with the applicant, applicable agencies, and the public to resolve these issues, through one or more public workshops, prior to the publication of the FSA.

Transmission System Engineering

- Staff concludes that the power plant switchyard and outlet facilities are acceptable and will comply with LORS assuming implementation of the proposed Conditions of Certification.

- The Cal-ISO granted final contingent approval to connect the Palomar Energy Project to the grid on the condition that the Cal-ISO recommendations listed in the Cal-ISO summary section are satisfied.
- The applicant's mitigation plans in the updated Detailed Facilities Study (DFS) associated with the Cal-ISO final contingent approval, the issues discussed in the July 9, SDG&E letter to Cal-ISO, and any other problems that arise, must be resolved prior to the FSA.
- Since staff's review of the updated DFS and filings are not yet complete, staff is unable to fully evaluate downstream impacts, transmission facilities and/or mitigation measures required for the reliable operation of the electrical transmission system. Therefore, staff cannot currently conclude that the project will comply with all applicable system reliability LORS. Staff is also unable to conclude that all of the potential downstream facilities required to reliably connect the proposed project to the transmission system have been identified. Staff will complete its review and offer its recommendations in the FSA.
- To resolve system reliability uncertainties, the applicant must identify the selected mitigation measures for any overloaded lines and provide backup data which provides the assumptions and analysis used in the Cal-ISO's evaluation

Environmental Justice

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

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

Socioeconomics Figure 1 identifies census blocks within six miles of the proposed project that have minority populations greater than 50 percent. Energy Commission staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed PEP. However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters of minority population. Staff considers these pockets to require a focused environmental justice analysis.

When a minority /or low-income population is identified, staff in the technical areas of air quality, public health, hazardous materials, noise, water, waste, traffic and transportation, visual resources, land use, socioeconomics, and transmission line safety and nuisance must consider possible impacts on the minority/low-income population as part of their analysis. This environmental justice analysis consists of identification of significant impacts (if any), identification of mitigation, and determination of whether

there is a disproportionate impact if an unmitigated significant impact has been identified.

Based on its preliminary analysis, staff has not identified any significant unmitigated impacts for the technical areas listed above, with the exception of air quality.

The air quality analysis for PM_{10} and PM_{10} precursor emissions during routine operations identifies significant impacts that require staff-recommended local mitigation. If staff's recommended mitigation is not acceptable to the applicant, the PM_{10} impacts could remain partially unmitigated and environmental justice may need to be further evaluated.

CONCLUSION AND RECOMMENDATIONS

Staff cannot recommend approval of PEP at this time due to unresolved air quality, biological resources, and transmission system engineering issues. As discussed above, the applicant will need to demonstrate its ability to provide the offsets needed to fully mitigate the construction and operation of the PEP, resolve any biological resource impact and compensation issues, and reach resolution of the transmission system engineering issues identified by staff. Staff will notice and conduct one or more workshops in September for the purpose of resolving these concerns and addressing any comments received on this PSA, prior to release of the FSA.

PALOMAR ENERGY PROJECT
PRELIMINARY STAFF ASSESSMENT

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INTRODUCTION

Bob Eller

PURPOSE OF THIS REPORT

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

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

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

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

ORGANIZATION OF THE STAFF ASSESSMENT

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

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

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

ENERGY COMMISSION SITING PROCESS

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

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

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, §

1743(b)). Staff is required to coordinate with other agencies to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, § 1744(b)).

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

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

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

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

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

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The

Compliance Monitoring Plan and General Conditions will be presented in the PMPD. Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. Staff's proposed description of the contents of the Compliance Monitoring Plan and proposed General Conditions are included in the **GENERAL CONDITIONS** section of this PSA.

Agency Coordination

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

The City of Escondido (City) is currently reviewing the specific plan for the Escondido Research and Technology Center (ERTC). The ERTC is the planned location for the Palomar Energy project (PEP). The City released their draft Environmental Impact Report (EIR) for the ERTC on July 26, 2002. A final EIR for the project is expected in early October. A decision on the ERTC Specific Plan is expected in November.

The City and the Energy Commission staff have executed a Memorandum of Understanding which coordinates the environmental and permitting reviews of the Palomar Energy Project and the Escondido Research and Technology Center (ERTC) Specific Plan. Because the ERTC Specific Plan includes modifications necessary for the PEP to comply with local LORS and because the PEP is physically dependent on the development of the ERTC, the approval of the PEP by the Energy Commission cannot occur until the City completes their EIR process and approves the ERTC specific plan.

PROJECT DESCRIPTION

Bob Eller

INTRODUCTION

On November 28, 2001, Palomar Energy LLC (Palomar) filed an Application for Certification (AFC), for its proposed Palomar Energy project (PEP) with the California Energy Commission seeking approval to construct and operate a 500 megawatt (MW) natural gas-fired, combined-cycle electric generating facility. The plant will be owned and operated by Palomar. The Energy Commission determined the application to be data adequate on February 6, 2002. This determination initiated staff's independent analysis of the proposed project.

While Palomar's AFC states that the facility will have a nominal electrical output of 500 MW, this nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure. As stated in staff's Efficiency analysis in this Preliminary Staff Analysis (PSA), staff believes the actual electric output of the facility, as proposed, is 546 MW net output, peaking.

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

ESCONDIDO RESEARCH AND TECHNOLOGY CENTER REVIEW

The PEP would be located on Planning Area 1 of the proposed Escondido Research and Technology Center (ERTC) project. The ERTC project and a draft Specific Plan for the ERTC are currently undergoing land use permitting and California Environmental Quality Act (CEQA) reviews, with the City of Escondido (City) as Lead Agency. The City released a draft Environmental Impact Report (EIR) on July 26, 2002. The City's Planning Commission and City Council are expected to consider a final EIR for the project in early October. A decision on the ERTC Specific Plan is expected in November.

The City and the Energy Commission staff have executed a Memorandum of Understanding to coordinate the environmental and permitting reviews of the PEP and the ERTC Specific Plan. The ERTC Specific Plan includes modifications necessary for the PEP to comply with local laws, ordinances, regulations and standards (LORS). Construction of the PEP is also physically dependent on the grading for the overall ERTC site. For these reasons, the approval of the PEP by the Energy Commission cannot occur until the City completes its EIR process and approves the ERTC project and specific plan.

LOCATION

The PEP would be located on a vacant 20-acre site within a planned 186-acre industrial park in the City of Escondido, San Diego County, California. The industrial park project is known as the Escondido Research and Technology Center (ERTC). **PROJECT DESCRIPTION Figure 1** shows the regional setting for the proposed project. The project site is located west of Interstate 15 and south of State Highway 78, about 600 feet southwest of the intersection of Vineyard Avenue and Enterprise Street. **PROJECT DESCRIPTION Figure 2** provides the local setting for the proposed project. **PROJECT DESCRIPTION Figure 3** shows the eight proposed ERTC planning areas. The PEP would be located on Planning Area 1 within the ERTC.

PROJECT EQUIPMENT AND LINEAR FACILITIES

The PEP consists of a proposed natural gas-fired combined cycle power plant and associated reclaimed water supply and brine return pipelines. The project will have a nominal electrical output of 546 MW net output, peaking.

The PEP will consist of two General Electric (GE) Frame 7-FA combustion gas turbines with evaporative inlet air coolers/filters, two multi-pressure heat recovery steam generators (HRSGs) with duct burners, and one single three-pressure, reheat, condensing steam turbine (ST) generator producing a maximum of 229 MW, arranged in a two-on-one combined cycle train.

At full load, each CTG generates approximately 165 MW at average ambient conditions. Heat from the CTG exhausts is used in the HRSGs to generate steam and to reheat steam. With the CTGs at full load, and the duct burners out-of-service, the HRSGs produce sufficient steam for operation of the ST at its base load output of 187 MW at average ambient conditions, which results in an overall plant gross output of approximately 517 MW. With the CTGs at full load and the duct burners in-service, the HRSGs produce sufficient steam for operation of the ST at its peaking output of 229 MW at average ambient conditions, resulting in an overall nominal gross output of approximately 560 MW.

To control emissions of air pollutants, PEP's CTGs and HRSGs will be equipped with dry low nitrogen oxide (NOx) combustors, selective catalytic reduction and an oxidation catalyst to control air emissions.

Power is generated at 18 kV by the two CTGs and ST, and then is stepped up to 230 kV for delivery to the power plant's interconnection with San Diego Gas & Electric (SDG&E). The 230 kV side of each step-up transformer is connected to a 230 kV ring bus switchyard. The switchyard is directly connected with the SDG&E transmission system via a loop-in of the existing 230 kV Escondido-Sycamore Canyon transmission line which runs along the western boundary of the project site. Because the 230 kV ring bus switchyard is directly connected to the existing SDG&E transmission line, the PEP will not require the construction of any new transmission lines.

PROJECT DESCRIPTION FIGURE 1

PROJECT DESCRIPTION FIGURE 2

PROJECT DESCRIPTION FIGURE 3

Natural Gas Facilities

The PEP will be fueled with natural gas delivered via the SDG&E gas system. An existing 16-inch SDG&E natural gas pipeline is located immediately adjacent to the northeast corner of the PEP site at the end of Enterprise Street. In order to relieve a bottleneck in a segment of the existing SDG&E gas system located about one mile northeast of the project site, SDG&E will construct an upgrade consisting of approximately 2600 feet of 16-inch pipeline. This SDG&E upgrade will be routed along Lincoln Avenue from its intersection with Rock Springs Road to its intersection with Metcalf Street, and then along Metcalf Street to its intersection with Mission Avenue, as shown on **PROJECT DESCRIPTION Figure 2**.

Water Supply and Waste Water Treatment

Reclaimed water for the project will be supplied from the City of Escondido's Hale Avenue Resource Recovery Facility (HARRF) via a new 1.1- mile, 16-inch supply pipeline extending from an existing reclaimed water main. The route of the reclaimed water supply pipeline is illustrated on **PROJECT DESCRIPTION Figure 2**. The small quantity of potable water required by the project will be provided by Rincon del Diablo Municipal Water District via the potable water system proposed to serve the ERTC.

At the power plant, a raw water storage tank with a capacity of 730,000 gallons will hold 530,000 gallons of reclaimed water for plant operation. This quantity is sufficient to cover a four-hour interruption of water supplied to the power plant. In addition, the raw water storage tank will hold 200,000 gallons of reclaimed water dedicated to the plant's fire protection water system.

Wastewater from process cooling at the PEP will be returned to the City of Escondido's HARRF via a new 1.1 mile, eight-inch return pipeline routed alongside the reclaimed water supply pipeline.

PROJECT CONSTRUCTION

Construction would begin immediately upon Energy Commission approval with a construction schedule of approximately 21 months.

Mass grading of the ERTC will result in a graded pad comprising each Planning Area, including Planning Area 1 proposed for use by the PEP. The cut-and-fill grading necessary to create the pad for Planning Area 1 will lower the current elevation of the PEP site by approximately 40 feet. The soil removed from Planning Area 1 will be used as fill in other portions of the industrial park.

Grading of the overall ERTC, including Planning Area 1, may begin as soon as the City acts on the ERTC project and specific plan. The grading is expected to be completed prior to the Energy Commission's decision on the PEP and prior to beginning any on-site work on the facility. Should the power plant not be constructed, Planning Area 1 will be used for alternative industrial land uses consistent with the development standards for the ERTC.

During construction there will be an average and peak on-site construction workforce of approximately 240 and 350 individuals, respectively.

Temporary construction laydown and parking areas will be provided south of the PEP site in Planning Area 2 of the industrial park, as illustrated in **PROJECT DESCRIPTION Figure 3**.

Construction access will be provided from State Highway 78 by traveling south on Nordahl Road, which becomes Vineyard Avenue, continuing southeast on Vineyard Avenue to the future Citracado Parkway, and south on Citracado Parkway to the project site. Equipment and materials will be delivered by truck. Construction will typically take place between the hours of 6 a.m. and 5:30 p.m., Monday through Friday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities. During the startup and testing phase of the project, some activities may continue 24 hours per day, 7 days per week.

FACILITY CLOSURE

The PEP will be designed for an operating life of 30 years. 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 setting for this project does not appear 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 at the time of closure. LORS pertaining to facility closure are identified in the technical sections of this assessment. Facility closure will be consistent with laws, ordinances, regulations and standards in effect at the time of closure.

REFERENCES

Palomar Energy, LLC, San Diego, California (Palomar) 2001a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 28, 2001.

AIR QUALITY

Brewster Birdsall

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the proposed Palomar Energy Project. Criteria air pollutants are those for which a federal or state ambient air quality standard has been established to protect public health. They include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), reactive organic gases (ROG, including volatile organic compounds or VOCs), and particulate matter less than 10 microns in diameter (PM_{10}).

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

- whether the proposed Palomar Energy Project is likely to conform with applicable Federal, State and San Diego Air Pollution Control District (SDAPCD, or District) air quality laws, ordinances, regulations and standards (Cal. Code Regs., tit. 20, §1744(b)); and
- whether the proposed Palomar Energy Project is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards and whether the mitigation proposed for the Palomar Energy Project is adequate to lessen the potential impacts to a level of insignificance (Cal. Code Regs., tit. 20, §1742(b)).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

The federal Clean Air Act requires any new major stationary sources of air pollution, and any major modifications to existing major stationary sources, to obtain a construction permit before commencing construction. This process is known as New Source Review (NSR). Its requirements differ depending on the attainment status of the area where the major facility is to be located. Prevention of Significant Deterioration (PSD) requirements apply in areas that are in attainment of the national ambient air quality standards. The Nonattainment NSR requirements apply to areas that have not been able to demonstrate compliance with national ambient air quality standards. The entire program, including both PSD and Nonattainment NSR permit reviews, is referred to as the federal NSR program.

Title V of the federal Clean Air Act requires states to implement and administer an operating permit program to ensure that large sources operate in compliance with the requirements included in the Code of Federal Regulations, Title 40, Part 70. A Title V permit contains all of the requirements specified in different air quality regulations that affect an individual project.

Title IV of the federal Clean Air Act requires implementation of an acid rain permit program (40 CFR 72). These regulations require subject facilities to obtain emission allowances for SOx emissions.

The U.S. Environmental Protection Agency (U.S. EPA) has reviewed and approved the SDAPCD's regulations for the PSD, Nonattainment NSR, Title V, and Title IV programs. These federal permitting programs have been delegated to the District for implementation. The District rules and regulations implementing the federal programs are as stringent as the federal regulations.

The Palomar Energy Project is also subject to the federal New Source Performance Standards (NSPS) in Code of Federal Regulations, Title 40, Part 60. Enforcement of NSPS has been delegated to the SDAPCD. The proposed combined cycle power plant must comply with the requirements of NSPS Subparts Da and GG. SDAPCD emission limitations or Best Available Control Technology (BACT) requirements are, however, more restrictive than the NSPS requirements, as will be discussed below. The federal NSPS allowable emissions concentration for NOx is 75 parts per million by dry volume (ppmvd) @ 15 percent O_2, and the NSPS requirement for SO_2 emissions concentration is 150 parts per million (ppm) @ 15percent O_2.

STATE

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 cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."

LOCAL

As part of the Energy Commission's licensing process, in lieu of issuing a construction permit to the applicant for the Palomar Energy Project, the District prepared a Preliminary Determination of Compliance (PDOC, SDAPCD 2002b). The PDOC evaluates whether, and under what conditions, the proposed project will comply with the applicable rules and regulations, as described below. The District conducted its review for the PDOC in a manner that is equivalent to that for an Authority to Construct. The PDOC was issued for public comment period on July 3, 2002, and it will be followed by a Final Determination of Compliance (FDOC). District Rule 20.5 specifies the timelines under which the District is obligated to make its preliminary and final decisions. Provided successful completion of the Energy Commission's licensing process and incorporation of the District's conditions into the Decision granted by the Energy Commission, the Determination of Compliance serves as an equivalent to an Authority to Construct. A Permit to Operate would later be issued by the District provided the construction is in compliance with the conditions of the Determination of Compliance and the Energy Commission Decision.

The project is subject to specific SDAPCD rules and regulations described below:

Regulation II – Permits

Rule 20.1 and 20.3 – New Source Review

Rules 20.1 and 20.3 generically apply to all sources subject to permitting under the Nonattainment NSR and PSD programs. Applicable components of these rules are described below.

Rule 20.3(d)(1) – Best Available Control Technology/Lowest Achievable Emission Rate

This subsection of the rule requires that Best Available Control Technology (BACT) be installed on a pollutant specific basis if emissions exceed 10 lbs/day for each criteria pollutant (except for CO, for which the PSD BACT threshold is 100 tons per year). This subsection also requires that Lowest Achievable Emission Rate (LAER) be installed on a pollutant specific basis if the emissions exceed 50 tons per year for NOx (oxides of nitrogen) or VOC emissions. Because the District attains the national ambient air quality standards for CO, SO_2, and PM_{10}, LAER does not apply to these particular pollutants (District Rule 20.3(d)(1)(v)).

The Palomar Energy Project is required to install LAER for NOx and BACT for CO, VOC, SOx, and PM_{10}.

Rule 20.3(d)(2) – Air Quality Impact Analysis (AQIA)

This portion of the rule requires that an AQIA be performed for air contaminants that exceed the trigger levels published in Table 20.3-1 of the District's Rules and Regulations. For an AQIA of PM_{10}, the rules require that direct emissions and emissions of PM_{10} precursors be included in the analysis.

The Palomar Energy Project is required to prepare an AQIA for NOx, CO, and PM_{10}.

Rule 20.3(d)(3) – Prevention Of Significant Deterioration (PSD)

This portion of the rule requires that a PSD evaluation be performed for all contaminants that exceed PSD major source trigger levels.

The Palomar Energy Project is required to complete a PSD evaluation for NO_2, CO, and PM_{10}.

Rule 20.3(d)(4) – Public Notice And Comment

This portion of the rule requires the District to publish a notice of the proposed action in at least one newspaper of general circulation in San Diego County as well as send notices to the U.S. EPA and the California Air Resources Board (CARB). The District must allow at least 30 days for public comment and consider all comments submitted. The District must also make all information regarding the evaluation available for public inspection.

The public notice and comment period for the Palomar Energy Project began when the District released the Preliminary Determination of Compliance (PDOC, SDAPCD 2002b) on July 3, 2002.

Rule 20.3(d)(5) – Emission Offsets

This portion of the rule requires that emissions of any federal nonattainment criteria pollutant or its precursors, which exceed major source thresholds, be offset with actual emission reductions. The District is a federal nonattainment area only for ozone. Therefore, this rule potentially requires offsets only for NOx and VOC emissions, as ozone precursors.

Because the Palomar Energy Project would not cause VOC emissions exceeding the major source levels (50 tons per year), offsets are required by this rule only for new project emissions of NOx.

Rule 20.3(e)(1) – Compliance Certification

This rule requires that the applicant certify that all major stationary sources owned or operated by the applicant in California are in compliance, or on an approved schedule for compliance, with all applicable emission limitations and standards under the federal Clean Air Act.

The AFC (p. 5.2-62) shows that neither Palomar Energy, LLC or Sempra Energy Resources own or operate another major stationary source.

Rule 20.3(e)(2) – Alternative Siting and Alternatives Analysis

This rule requires that the applicant conduct an analysis of alternative sites, sizes, production processes, and environmental control techniques, which demonstrates that the benefits of the proposed project outweigh the environmental and social costs.

The Alternatives analysis included with the AFC (Section 3) will be used for this requirement.

Rule 20.5 – Power Plants

This rule requires that the District prepare a decision of Preliminary and Final Determination of Compliance (PDOC and FDOC) to the Energy Commission, which shall confer the same rights and privileges as an Authority to Construct only after successful completion of the Energy Commission‘s licensing process.

Regulation IV – Prohibitions

Rule 50 – Visible Emissions

This rule prohibits air contaminant emissions into the atmosphere darker than Ringelmann Number 1 (20percent opacity) for more than an aggregate of three minutes in any consecutive 60 minute time period.

Rule 51 – Nuisance

This rule prohibits the discharge of air contaminants that cause or have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public or damage to any business or property.

Rule 52 – Particulate Matter

This rule is a general limitation for all sources of particulate matter to not exceed 0.10 grain per dry standard cubic foot (0.23 grams per dry standard cubic meter) of exhaust gas.

Rule 53 – Specific Air Contaminants

This rule limits emissions of sulfur compounds (calculated as SO_2) to less than or equal to 0.05 percent, by volume, on a dry basis. This rule also contains a limitation restricting particulate matter emissions from gaseous fuel combustion to less than or equal to 0.10 grains per dry standard cubic foot of exhaust calculated at 12 percent CO_2.

Rule 62 – Sulfur Content of Fuels

This rule requires the sulfur content of gaseous fuels to contain no more than 10 grains of sulfur compounds, calculated as hydrogen sulfide, per 100 cubic feet of dry gaseous fuel (0.23 grams of sulfur compounds, calculated as hydrogen sulfide, per cubic meter of dry gaseous fuel), at standard conditions.

Rule 68 – Oxides Of Nitrogen From Fuel Burning Equipment

This rule limits NOx emissions from any equipment burning gaseous fuel to less than 125 ppmvd calculated as NO_2 @ 3 percent O_2. Equipment regulated by Rule 69.3.1 is exempt from these limitations.

Rule 69.3 – Stationary Gas Turbines - Reasonably Available Control Technology

This rule limits NOx emissions from gas turbines greater than 0.3 MW to 42 ppm at 15 percent oxygen when fired on natural gas. The rule also specifies monitoring and record keeping requirements. Startups, shutdowns, and fuel changes are defined by the rule and excluded from compliance with these limits. This limit is less stringent than the BACT/LAER requirement of Rule 20.3(d)(1).

Rule 69.3.1 – Stationary Gas Turbines - Best Available Retrofit Control Technology

This rule limits NOx emissions from existing and new gas turbines greater than 10 MW to 15x(E/25) ppm when operating uncontrolled and 9x(E/25) ppm at 15 percent oxygen when operating with controls and averaged over a one-hour period (where E is the percent thermal efficiency of the unit, typically between 30 to 40 percent for gas turbines). The rule also specifies monitoring and record keeping requirements. Startups, shutdowns, and fuel changes are defined by the rule and excluded from compliance with these limits. This limit is less stringent than the BACT/LAER requirement of Rule 20.3(d)(1).

Regulation X – Standards of Performance for New Stationary Sources

Adopts federal New Source Performance Standards (NSPS, 40 CFR 60) by reference. The federal requirements are described above.

Regulation XI – National Emission Standards for Hazardous Air Pollutants

Adopts federal standards for hazardous air pollutants by reference. No such standards presently exist that would apply to the project.

Regulation XII – Toxic Air Contaminants

Rule 1200 – Toxic Air Contaminants, New Source Review

This rule requires a health risk estimate for sources of toxic air contaminants. Toxics Best Available Control Technology (TBACT) must be installed if the HRA shows an incremental cancer risk greater than one in a million, and no source would be allowed to cause an incremental cancer risk exceeding ten in a million.

Regulation XIV – Title V Operating Permits

Rule 1401 – General Provisions

This regulation contains the requirements for federal Title V Operating Permits. The applicant is required to submit a Title V Operating Permit application after successful construction and startup of the project.

Rule 1412 – Federal Acid Rain Program Requirements

This regulation contains the requirements for participation in the federal Acid Rain Program. The applicant is required to submit an application to enter the program prior to startup.

CITY OF ESCONDIDO

Zoning Code – Article 26, Industrial Zones

The City of Escondido Municipal Code includes a performance standard that all uses and operations within industrial zones be conducted so that no unreasonable odor, vapor, dust, or smoke constituting a public nuisance is discernable at the site's property line (Section 33-570).

Zoning Code – Article 47, Environmental Quality Regulations

The City of Escondido has set forth thresholds for projects that must comply with the CEQA process. Section 33-924(a)(1)(G) of Article 47 of the Zoning Code specifies that an Environmental Impact Report (EIR) should be prepared for projects that cause exceed certain emission thresholds.

The Palomar Energy Project is in compliance with this requirement because, the AFC and subsequent Energy Commission review includes an analysis that is CEQA-equivalent to the level of analysis found in an EIR. The Energy Commission decision serves as a CEQA document.

SETTING

METEOROLOGICAL CONDITIONS

The semi-permanent Pacific High over the eastern Pacific Ocean dominates the climate at the project site. San Diego County has a subtropical climate. The summers are typically cool and winters mild near the ocean in comparison to locations further inland. Ambient temperatures are rarely below freezing or over 100°F. Peak temperatures increase as you move away from the coast. During the winter months, the Pacific High weakens and migrates to the south allowing Pacific storms into California. At Escondido, the annual rainfall is about 16 inches, most of which occurs between November and April (WRCC 2002).

The wind flow, atmospheric stability, and mixing heights are important factors in the determination of pollutant dispersion. Winds at Escondido are generally strongest in the spring and fall, with occasional winter storms causing high peak wind speeds. The surface-level winds are generally from the west, except in the winter when the flow reverses. 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, air pollutants readily disperse, resulting in reduced air quality impacts near any single air pollution source. During the winter months, between storms, however, very stable atmospheric conditions occur, resulting in very little mixing. Under these conditions, minimal air pollutant dispersion occurs, and consequently higher air quality impacts may result near sources. Because lower mixing heights generally occur during the winter, along with lower mean wind speeds and less vertical mixing, dispersion occurs less rapidly.

EXISTING AIR QUALITY

The U.S. EPA and the CARB both require the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically more restrictive than the federal AAQS (also known as national standards or NAAQS), which are established by the U.S. EPA. The state and federal air quality standards are listed in **AIR QUALITY Table 1**. As indicated in **Table 1**, the averaging times for the various air quality standards (the duration over which they are measured) range from hourly to annually. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant per cubic meter of air (mg/m^3 and $\mu g/m^3$, respectively).

In general, an area or air basin is designated as attainment for a specific pollutant if the concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as nonattainment for an air contaminant if that standard is violated. Where ambient data are unable to support designation as either attainment or nonattainment, the area would 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 and nonattainment for another, or attainment for the federal standard and nonattainment for the state standard for the same contaminant. The entire area within the boundaries of an air district or air basin is usually evaluated to determine

the district's attainment status. **AIR QUALITY Table 2** shows the area designation status of the San Diego County Air Basin for each criteria pollutant for both the federal and state ambient air quality standards. The classifications of severity go from "moderate" to "extreme".

Ozone, PM_{10}, NO_2, and CO data are recorded at the Escondido air monitoring station on East Valley Parkway roughly three miles from the site. Data for SO_2 are recorded only at stations in the southern portion of San Diego County. Data from a station in Chula Vista is used in this analysis for current SO_2 values. In the tables that follow, other data from stations in Oceanside, San Diego, and Otay Mesa are also presented, where available and relevant. A summary table is provided at the end of this section.

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

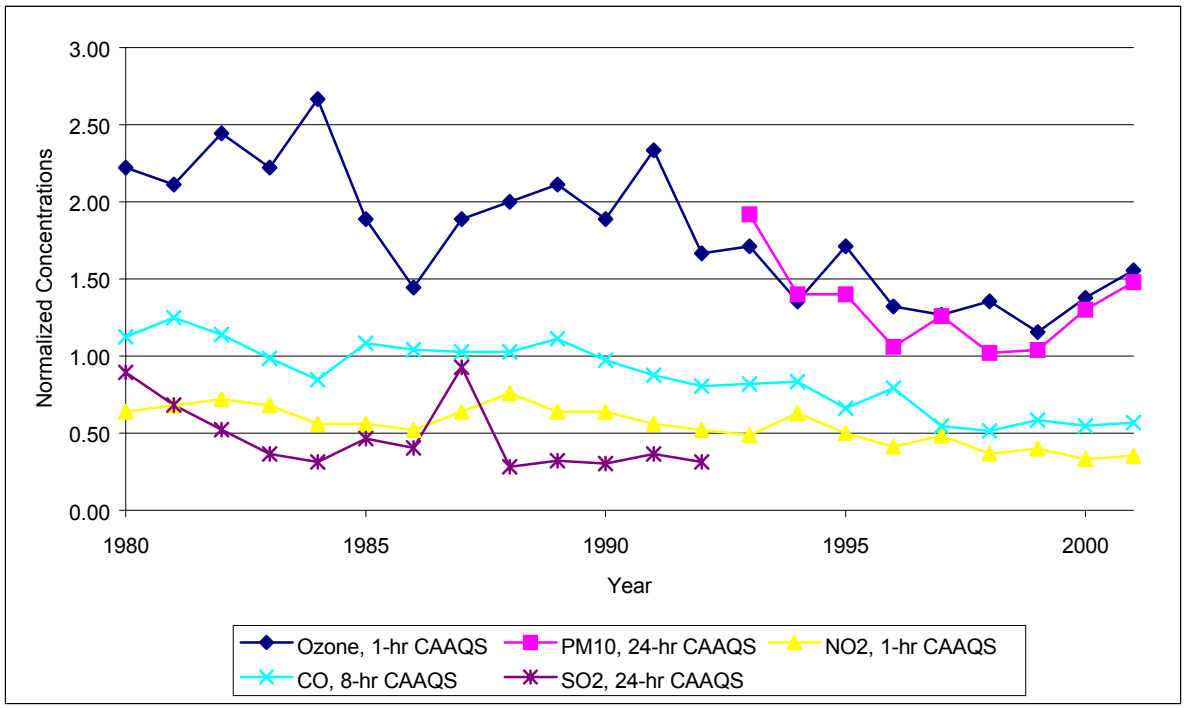
Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	1 Hour	0.12 ppm (235 μg/m^3)	0.09 ppm (180 μg/m^3)
	8 Hour	0.08 ppm (160 μg/m^3)	—
Respirable Particulate Matter (PM_{10})	Annual Geometric Mean	—	30 μg/m^3
	24 Hour	150 μg/m^3	50 μg/m^3
	Annual Arithmetic Mean	50 μg/m^3	—
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	65 μg/m^3	—
	Annual Arithmetic Mean	15 μg/m^3	—
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 μg/m^3)	—
	1 Hour	—	0.25 ppm (470 μg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Sulfur Dioxide (SO_2)	Annual Average	0.03 ppm (80 μg/m^3)	—
	24 Hour	0.14 ppm (365 μg/m^3)	0.04 ppm (105 μg/m^3)
	3 Hour	0.5 ppm (1300 μg/m^3)	—
	1 Hour	—	0.25 ppm (655 μg/m^3)
Sulfates (SO4(2-))	24 Hour	—	25 μg/m^3
Lead	30 Day Average	—	1.5 μg/m^3
	Calendar Quarter	1.5 μg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 μg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.010 ppm (26 μg/m^3)
Visibility Reducing Particulates	1 Observation	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

AIR QUALITY Table 2
Federal and State Area Designations for the San Diego County Air Basin

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

In **AIR QUALITY Figure 1**, the trends of normalized maximum short term concentrations of criteria pollutants in the project area are charted from 1980 to 2001. All data in this figure are from the monitoring station in Escondido. At this station SO_2 data collection stopped after 1992, when PM_{10} data collection began. The availability of this data is shown in the tables that follow this chart. Normalized concentrations represent the ratio of the highest measured concentrations for a given averaging period in a given year to the most-stringent applicable national or state ambient air quality standard. Therefore, normalized concentrations lower than 1.00 indicate that the measured concentrations were lower than the most-stringent ambient air quality standard.

AIR QUALITY Figure 1
Normalized Maximum Short-Term Historical Air Pollutant Concentrations



Note: A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. For example, in 1998 the highest one-hour average ozone concentration measured in Escondido was 0.122 ppm. Since the most stringent ambient air quality standard is the state standard of 0.09 ppm, the 1998 normalized ozone concentration is 0.122/0.09 = 1.36.

Source: Escondido Data, CARB 2002a.

Ozone

In the presence of ultraviolet radiation, both NOx and VOC go through a number of complex chemical reactions to form ozone. **AIR QUALITY Table 3** summarizes the best representative ambient ozone data collected from three different monitoring stations close to the project site. The table includes the maximum hourly concentration and the number of days above the state standards. Ozone formation is highest in the spring and summer, when abundant sunshine and high temperatures are available to trigger the necessary photochemical reactions, and lowest in the winter.

AIR QUALITY Table 3
Ozone Air Quality Summary, 1994-2001

Year	Escondido, East Valley Parkway			Oceanside, Mission Avenue			San Diego, Overland Avenue		
	Days Above 1-hr CAAQS	Max. 1-hr Level (ppm)	Max. 8-hr Level (ppm)	Days Above 1-hr CAAQS	Max. 1-hr Level (ppm)	Max. 8-hr Level (ppm)	Days Above 1-hr CAAQS	Max. 1-hr Level (ppm)	Max. 8-hr Level (ppm)
1994	10	0.12	0.105	2	0.11	0.089	2	0.10	0.089
1995	12	0.15	0.107	5	0.11	0.083	8	0.12	0.078
1996	12	0.12	0.099	4	0.11	0.089	7	0.12	0.099
1997	5	0.11	0.090	6	0.11	0.081	7	0.12	0.086
1998	9	0.12	0.092	3	0.11	0.088	4	0.13	0.092
1999	1	0.10	0.080	0	0.09	0.081	3	0.10	0.082
2000	6	0.12	0.106	1	0.10	0.083	5	0.12	0.090
2001	3	0.14	0.098	1	0.10	0.089	7	0.14	0.094

California Ambient Air Quality Standard (CAAQS): Hourly 0.09 ppm
National Ambient Air Quality Standard: 8-hour 0.08 ppm
Source: CARB Air Quality Data CD-ROM, 2001; and CARB web site, http://www.arb.ca.gov/adam/, Accessed June 2002.

Inhalable Particulate Matter and Secondary PM_{10}

As **AIR QUALITY Table 4** indicates, the project area also commonly experiences violations of the state 24-hour PM_{10} standard. The violations of the state 24-hour standard occur predominately in the winter, with violations beginning occasionally during October, occurring mainly in November, December, and January, and ending during February.

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

PM nitrate can be formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the wintertime are a significant portion of the total PM_{10}, and may be even a higher contributor to particulate matter of less than 2.5 microns ($PM_{2.5}$). Nitrate ions are only one component of PM nitrate, which typically takes the form of ammonium nitrate or sodium nitrate.

AIR QUALITY Table 4
PM_{10} Air Quality Summary, 1994-2001

Year	Escondido, East Valley Parkway			Oceanside, Mission Avenue			San Diego, Overland Avenue		
	Days Above CAAQS (calc)	Max. Daily Average (µg/m^3)	Annual Arith. Mean (µg/m^3)	Days Above CAAQS (calc)	Max. Daily Average (µg/m^3)	Annual Arith. Mean (µg/m^3)	Days Above CAAQS (calc)	Max. Daily Average (µg/m^3)	Annual Arith. Mean (µg/m^3)
1994	30	70	35.3	---	---	---	6	60	30.0
1995	30	70	31.6	21	80	29.9	36	82	33.7
1996	12	53	26.8	6	63	25.6	0	50	23.1
1997	18	63	28.8	0	50	24.8	0	47	24.6
1998	3	51	20.5	0	36	23.3	0	36	21.5
1999	6	52	30.0	---	---	---	4	56	27.0
2000	12	65	29.6	---	---	---	18	55	26.6
2001	6	74	30.0	---	---	---	0	40	25.0

California Ambient Air Quality Standard (CAAQS): Daily 50 µg/m^3
National Ambient Air Quality Standard: Annual Arithmetic Mean 50 µg/m^3
Source: CARB Air Quality Data CD-ROM, 2001; and CARB web site, http://www.arb.ca.gov/adam/, Accessed June 2002.

Days above the state standard (calculated): Calculated based on periodic or occasional monitoring. For example, at locations where PM_{10} is monitored once every six days, the potential number of violation days is calculated by multiplying the actual number of days of violations by six.

Violations of the state ambient air quality standards for PM_{10} persist in the region. At the Escondido monitoring location, the trend in **AIR QUALITY Table 4** shows that fewer violations have occurred in recent years but the magnitude of the violations has not been reduced. On a very few days in 1999-2001, PM_{10} concentrations have ranged from 30 to nearly 50 percent over the PM_{10} 24-hour CAAQS, as shown in **AIR QUALITY Figure 1**. Annual average PM_{10} concentrations in the area have achieved only gradual reductions shown between 1994-2001.

Fine Particulate Matter ($PM_{2.5}$)

The U.S. EPA first established $PM_{2.5}$ ambient air quality standards in 1997. The air agencies in California are now deploying $PM_{2.5}$ ambient air quality monitors throughout the state. $PM_{2.5}$ ambient air quality attainment plans, if needed, are due to the U.S. EPA by 2005.

Preliminary data is available for $PM_{2.5}$ from the Escondido monitoring station. At this location, the maximum 24-hour concentrations occurring in 1999, 2000, and 2001 were

64.3, 65.9, 60.0 μg/m^3, respectively. Portions of this data have not been verified by U.S. EPA and CARB. Compared to the 1997 U.S. EPA standard (65 μg/m^3), only one day over the two-to-three-year period exceeded the standard (CARB web site, June 2002). Attainment designations for $PM_{2.5}$ will be on a statistical review of finalized ambient data. Because a data record of at least three years would be necessary to determine attainment status, the $PM_{2.5}$ attainment status for the San Diego Air Basin has not yet been established. Although the Escondido station appears likely to attain the $PM_{2.5}$ standard, more frequent violations may occur in other areas of the San Diego Air Basin.

If the San Diego Air Basin is eventually designated as a $PM_{2.5}$ nonattainment area, the SDAPCD would be responsible for developing control strategies. Because PM_{10} includes $PM_{2.5}$ as a subset and reactive precursors that lead to ozone can also lead to $PM_{2.5}$, the established strategies for controlling PM_{10} and ozone precursors (including existing programs for combustion sources) also presently help to reduce $PM_{2.5}$ concentrations.

Nitrogen Dioxide (NO_2)

As shown in **AIR QUALITY Table 5**, the maximum one-hour and annual concentrations of NO_2 at the air monitoring stations in the region are lower than California Ambient Air Quality Standards. Approximately 90 percent of the NOx emitted from combustion sources is NO, while the balance is NO_2. The components of NOx are chemically unstable. NOx can react with VOC to form ozone, and NO can be oxidized in the atmosphere to NO_2. Some level of ultraviolet or photochemical activity is needed for either of these conversions. The formation of NO_2, with the help of abundant ozone, is according to the following reaction.

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

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

AIR QUALITY Table 5
NO_2 Air Quality Summary, 1994-2001

Year	Escondido, East Valley Parkway		Oceanside, Mission Avenue		San Diego, Overland Avenue	
	Maximum 1-hr Average (ppm)	Annual Average (ppm)	Maximum 1-hr Average (ppm)	Annual Average (ppm)	Maximum 1-hr Average (ppm)	Annual Average (ppm)
1994	0.157	0.0243	0.123	0.0204	0.127	0.0239
1995	0.125	0.0257	0.139	0.0194	0.124	0.0229
1996	0.103	0.0203	0.106	0.0171	0.124	0.0217
1997	0.121	0.0207	0.106	0.0177	0.105	0.0216
1998	0.092	0.0181	0.087	0.0162	0.080	0.0205
1999	0.100	0.0226	0.133	0.0192	0.101	0.0228
2000	0.083	0.0205	0.114	0.0172	0.098	0.0212
2001	0.088	---	0.096	---	0.095	---

California Ambient Air Quality Standard: Hourly 0.25 ppm
National Ambient Air Quality Standard: Annual 0.053 ppm
Source: CARB Air Quality Data CD-ROM, 2001; and CARB web site, http://www.arb.ca.gov/adam/, Accessed June 2002.

Carbon Monoxide (CO)

As **AIR QUALITY Table 6** shows, the maximum one-hour and eight-hour CO concentrations are less than the California Ambient Air Quality Standards (CAAQS). CO is considered a local pollutant as it is inert and found in highest concentrations only near the source of emission. Automobiles and other mobile sources are the principal source of the CO emissions. High levels of CO emissions can also be generated from fireplaces and wood-burning stoves. There have been no violations of the standards at the Escondido monitoring station since 1989.

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

AIR QUALITY Table 6
CO Air Quality Summary, 1994-2001

Year	Escondido, East Valley Parkway			Oceanside, Mission Avenue		
	Days Above 8-hr CAAQS/ NAAQS	Max. 1-hr Level (ppm)	Max. 8-hr Level (ppm)	Days Above 8-hr CAAQS/ NAAQS	Max. 1-hr Level (ppm)	Max. 8-hr Level (ppm)
1994	0	11.0	7.51	0	5.2	3.91
1995	0	9.9	5.95	0	4.4	3.13
1996	0	11.2	7.13	0	4.0	2.60
1997	0	9.3	4.91	0	6.1	2.88
1998	0	10.2	4.63	0	3.2	2.31
1999	0	9.9	5.26	0	2.8	2.01
2000	0	9.3	4.93	---	---	---
2001	0	---	5.11	---	---	---

California Ambient Air Quality Standard: 1-hr, 20 ppm; 8-hr, 9 ppm
National Ambient Air Quality Standard: 1-hr, 35 ppm; 8-hr, 9 ppm
Source: CARB Air Quality Data CD-ROM, 2001; and CARB web site, http://www.arb.ca.gov/adam/, Accessed June 2002.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Pipeline-quality natural gas contains very little sulfur and consequently causes very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content such as lignite (a type of coal) emit very large amounts of SO_2 when combusted. Sources of SO_2 emissions are from every economic sector and include use of gaseous, liquid, and solid fuels. California is designated either attainment or unclassified for all SO_2 ambient air quality standards. **AIR QUALITY Table 7** shows the historic one-hour, 24-hour and annual average SO_2 concentrations measured at the nearby monitoring stations. Monitoring for SO_2 at Escondido ended after 1992. As **AIR QUALITY Table 7** shows, concentrations of SO_2 are well below the state and federal SO_2 ambient air quality standards.

Summary

Staff normally recommends that the maximum background ambient air concentrations from the most-representative stations over the past three years be used in the modeling and impacts analyses. The applicant identified the maximum criteria pollutant concentrations from 1998-2000, which have been supplemented by staff with concentrations from 2001. All are Escondido data except for SO_2, which is from Chula Vista. The recommended background concentrations for the modeling and impacts analyses are summarized in **AIR QUALITY Table 8**.

AIR QUALITY Table 7
SO_2 Air Quality Summary, 1994-2001

Year	Chula Vista			Otay Mesa		
	Maximum 1-hr Average (ppm)	Maximum 24-hr Average (ppm)	Annual Average (ppm)	Maximum 1-hr Average (ppm)	Maximum 24-hr Average (ppm)	Annual Average (ppm)
1994	0.098	0.0243	0.0021	0.062	0.0120	0.0030
1995	0.081	0.0207	0.0029	0.065	0.0156	0.0035
1996	0.087	0.0244	0.0040	0.060	0.0204	0.0047
1997	0.081	0.0206	0.0029	0.062	0.0127	0.0040
1998	0.149	0.0205	0.0028	0.054	0.0132	0.0030
1999	0.084	0.0167	0.0024	0.081	0.0140	0.0031
2000	0.045	0.0123	0.0027	0.058	0.0135	0.0036
2001	---	0.0150	0.0030	---	0.0120	0.0050

California Ambient Air Quality Standard: Hourly 0.250 ppm
California Ambient Air Quality Standard: 24-hr 0.040 ppm
National Ambient Air Quality Standard: Annual 0.030 ppm
Source: CARB Air Quality Data CD-ROM, 2001; and CARB web site, http://www.arb.ca.gov/adam/, Accessed June 2002.

AIR QUALITY Table 8
Palomar Energy, Staff Recommended Background Concentrations

Pollutant	Averaging Time	Maximum Monitored Background (ppm)	Staff-Recommended Background ($\mu g/m^3$)	Limiting Standard (ppm)	Type of Standard
Ozone	1 hour	0.14	---	0.09	CAAQS
	8 hour	0.106	---	0.08	NAAQS
PM_{10}	24 hour	74 $\mu g/m^3$	74	50 $\mu g/m^3$	CAAQS
	Annual Geometric Mean	28.5 $\mu g/m^3$	28.5	30 $\mu g/m^3$	CAAQS
	Annual Arithmetic Mean	30.0 $\mu g/m^3$	30.0	50 $\mu g/m^3$	NAAQS
NO_2	1 hour	0.100	191	0.25	CAAQS
	Annual	0.0226	44	0.053	NAAQS
CO	1 hour	10.2	11,870	20	CAAQS
	8 hour	5.26	6,123	9	NAAQS
SO_2	1 hour	0.149	397	0.25	CAAQS
	3 hour	---	397	0.5	NAAQS
	24 hour	0.0205	53.0	0.04	CAAQS
	Annual	0.003	8.0	0.03	NAAQS

Notes:

1. Staff-Recommended Background data ($\mu g/m^3$) is from in AFC p. 5.2-27, except PM_{10} (24-hour and AAM). Staff identified higher background PM_{10} concentrations at Escondido in 2001.

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

PROJECT DESCRIPTION AND EMISSIONS

This section describes the project design, project emissions, and air pollutant control devices as described in the Palomar Energy Project AFC (Palomar 2001a).

CONSTRUCTION

Project Site

The project would occupy a 20-acre site within a 186-acre industrial park that is currently being reviewed by the City of Escondido. The power plant site would graded to provide fill for other portions of the industrial park. More than 700,000 cubic yards of material would be cut and removed from the project site (Palomar 2001a, AFC p. 2-46). Site preparation for a portion of the Escondido Research and Technology Center (ERTC) would be necessary to enable construction of the Palomar Energy Project as proposed. The activities related to excavating and grading ERTC Planning Area 1 (PA1) would involve intense heavy-equipment use to remove material from the power plant site. The mass grading would leave the project site in a depression relative to other sites in the industrial park.

The Palomar Energy Project construction activities addressed by this analysis include all of the grading necessary to improve the undeveloped PA1 of ERTC into the operating power plant. Along with on-site development of the power plant, new linear facilities would require off-site construction activities. These are discussed below.

On-site project construction will require approximately 21 months after mass grading for the industrial park is complete. Mass excavation and grading for PA1 would require approximately three months preceding the power plant construction activity. This construction schedule is based on an 11.5 hour work day (11 hours of equipment operation with half-hour setup each day), 22 days per month. Additional construction shifts may be necessary to make up schedule deficiencies. Towards the end of the 21-month construction period, additional time, including 24-hour-per-day work, would be necessary for startup and commissioning of the equipment (Palomar 2001a, AFC Section 2.8, p. 2-53).

Linear Facilities

The ancillary linear facilities for the power plant would be a new 1.1-mile water supply and brine return pipeline from the Hale Avenue Resource Recovery Facility and upgrades to a 2,600-foot segment of natural gas pipeline one mile northeast of the site. The water/brine pipeline would require approximately six months of construction work, and the natural gas pipeline would require approximately three months (Palomar 2001a, AFC Appendix E.2, p. E.2-2). Construction of the linear facilities would occur near urban residential and commercial land uses.

Project Construction Emissions

During the construction period, air emissions will be generated from the exhaust of the heavy equipment and fugitive dust from grading, excavation, miscellaneous earthwork, and any activity on unpaved surfaces. Heavy equipment would include loaders and on-highway trucks to deliver construction materials, compactors, graders, and backhoes for earthwork, cranes, lifts, and smaller equipment such as welders and air compressors.

Fugitive dust emissions will occur due to activity on the exposed surfaces at the site, especially those portions that are unpaved. Equipment emissions and fugitive dust emissions would also occur offsite on the corridors for the linear facilities (i.e., along the new water pipelines and upgraded fuel gas line). The applicant estimated emissions based on construction for an 8-hour and 11-hour day, 22 days per month. This analysis summarizes the highest emissions anticipated under either schedule.

AIR QUALITY Table 9 summarizes the different levels of criteria pollutants that are estimated to be generated from on-site and project-related linear construction activities due to the Palomar Energy Project (Palomar 2001a, AFC Appendix E.2).

AIR QUALITY Table 9
Palomar Energy, Estimated Emissions from Construction
(Peak Daily Emissions and Annual Tons)

	NOx		PM_{10}		C0		SOx		VOC	
Equipment	**lb/day**	**Tpy**	**lb/day**	**tpy**	**lb/day**	**Tpy**	**lb/day**	**tpy**	**lb/day**	**tpy**
PA1 Excavation/Grading Equipment/Vehicles	497	14.9	29	0.9	611	18.3	12	0.3	72	2.2
PA1 Excavation/Grading Fugitive Dust	---	---	74	2.2	---	---	---	---	---	---
Power Plant Onsite Equipment/Vehicles	128	13.3	5	0.6	482	58.6	3	0.3	32	3.6
Power Plant Onsite Fugitive Dust	---	---	11	1.2	---	---	---	---	---	---
Power Plant Offsite Commuters/Deliveries	147	9.4	24	2.0	508	45.2	---	---	81	7.1
Water Pipeline Equipment (1)	10	0.6	1	0.05	7	0.4	0.2	0.01	2	0.1
Water Pipeline Offsite Commuters/Deliveries	18	0.3	3	0.1	53	1.3	---	---	9	0.2
Gas Pipeline Equipment (1)	13	0.3	1	0.03	9	0.2	0.3	0.01	2	0.1
Gas Pipeline Offsite Commuters/Deliveries	21	0.2	3	0.1	51	0.6	---	---	8	0.1

Source: AFC Appendix E.2, Tables E.2-1 through E.2-5, E.2-8, E.2-23, and E.2-25; AFC Appendix E.6, Tables E.6-1 through E.6-5 (Palomar 2001a).

Notes: 1. For this equipment, daily emissions are averages calculated from AFC Table E.2-8 (Palomar 2001a).
2. Daily emissions are based on 22 days per month. The applicant also provided two sets of peak hourly and average hourly emission estimates, one each for the 8-hour day (Palomar 2001a, AFC Appendix E.2) and the 11-hour day (Palomar 2002b, Data Response 8). The highest emission rates are shown.

The construction equipment and fugitive dust emissions provided above were based on emission factors derived from U.S. EPA and CARB regulations and guidance documents, such as AP-42 (U.S. EPA, 1991) the South Coast Air Quality Management District Air Quality Handbook (SCAQMD 1993). The emission calculations of AFC Appendix E.2 also rely upon estimates of the number of operational hours for each piece of equipment throughout entire project construction schedule. The equipment emission calculations assume use of California's low-sulfur diesel fuel (500 ppmw sulfur), use of new engines that comply with U.S. EPA off-road equipment emission standards from 1996, and use of catalyzed particulate filters on selected pieces of diesel-fueled equipment (e.g., air compressors and some earthmoving equipment)

(Palomar 2001a, AFC Appendix Table E.2-27). Also included in the assumptions are typical measures that the applicant anticipates implementing to minimize fugitive dust (Palomar 2001a, AFC Appendix Table E.2-28). These include watering exposed surfaces and minimizing the track-out of mud from the project site to the surrounding roads. Each of these strategies would be implemented in conjunction with those recommended by the Energy Commission.

OPERATIONAL PHASE

Equipment Description

The major equipment proposed in the application include the following (Palomar 2001a, AFC Section 2.4):

- New combined cycle power plant with two combustion turbine generators (CTGs) each generating approximately 165 MW. Each CTG includes dry low-NOx combustors for NOx reduction. Each CTG would be coupled to heat recovery steam generator (HRSG) with supplemental duct burners and an integral SCR to control NOx and an oxidation catalyst pollution control system to control CO and VOC emissions from the CTG/HRSG. The combustion turbines would be supplied by General Electric Power Systems (Model 7FA).
- Each duct burner would have a firing capacity of 195 MMBtu/hr (HHV) and would be anticipated to operate approximately 2,000 hours per year.
- One steam turbine generator (STG) would be installed with the two CTGs. The STG system would generate approximately 187 MW at base load, average conditions. With the CTGs at full load and the duct burners in service, the overall gross output of the plant will be approximately 560 MW.
- A continuous emission monitoring (CEM) system for the CTG/HRSG stacks.
- Aqueous ammonia storage (one 20,000-gallon tank), vaporization, and injection system for SCR.
- Circulating water cooling system for heat rejection of the steam cycle and closed coolant system. The cooling system includes a surface condenser that is cooled with circulating water from an evaporative cooling tower. The cooling tower would be a seven-cell plume-abated counter-flow mechanical draft design with drift eliminators to minimize drift emissions.
- Electric power for the fire water pump and emergency systems, from AC power or the plant's DC power supply for emergency conditions.

Equipment Operation

The Palomar Energy Project will be fueled exclusively by pipeline-quality natural gas. It is designed to provide an overall gross electrical output of 560 MW. Natural gas would be delivered to the site from an existing, upgraded pipeline. Emission estimates assume full-time availability of the plant (8,760 hours per year) while firing each duct burner 2,000 hours per year. Anticipated annual availability would be in the range of 92 to 96 percent (Palomar 2001a, AFC p. 2-54).

Emission Controls

Both of the CTGs will be equipped with dry low-NOx combustors followed by SCR and oxidation catalysts in the HRSGs. The applicant proposes to use this system to reduce NOx to 2.0 ppmvd at 15 percent O_2 (based on a 3-hour average). As a reagent, the SCR system relies on use of ammonia vapor injected into the exhaust stream. As proposed, stack emissions of ammonia (known as ammonia slip) would not exceed 10 ppmvd (Palomar 2001a, AFC p. 2-41). Integral to the HRSG are oxidation catalysts that would reduce CO and VOC emissions. The applicant proposes use of the oxidation catalyst system to reduce VOC emissions to 3.0 ppm as methane, and use of good combustion practices along with the oxidation catalyst to reduce CO concentrations to no more than 4.0 ppmvd at 15 percent O_2 (based on a three average).

Continuous emission monitors (CEMs) would be installed on the CTG/HRSG exhaust stacks to monitor NOx, CO, and oxygen concentrations to assure adherence with the proposed emission limits. The CEM system will generate reports of emissions data in accordance with permit requirements and will send alarm signals to the plant's control room when the level of emissions approaches or exceeds pre-selected limits.

The exclusive use of pipeline-quality natural gas, a relatively clean-burning fuel, will limit the formation of PM_{10} and SO_2 emissions. Natural gas contains very little noncombustible gas or solid residues and a small amount of reduced sulfur compounds including mercaptan. Pipeline quality natural gas normally contains anywhere between 0.05 to 1.0 grains (the regulatory limit) of sulfur per 100 scf. The applicant anticipates the gas to contain less than 0.75 grains sulfur/100 scf (Palomar 2001a, AFC Appendix Table E.3-1). Combustion turbines similar to those proposed (GE Model 7FA) normally achieve about 10 to 14 lb/hr PM_{10} depending on duct burner operation and configuration.

The cooling tower would be equipped with a high efficiency drift eliminator to control PM_{10} emissions. The drift eliminator will control the drift fraction to 0.0005 percent of the circulating water flow. The applicant proposed to quantify drift emissions based on an assumption that only 50 percent of all dissolved solids in the cooling water eventually becomes airborne PM_{10} and a 50 percent fraction would remain larger particles (Palomar 2001a, AFC Appendix E.3-2). A theoretical analysis was submitted to support this (Palomar 2002b, Data Response 4). However, staff notes that the total dissolved solids (TDS) of the cooling water would consist of a variety of magnesium-, calcium-, and sodium-based salts (Palomar 2001a, AFC Table 2.4-3) that may not readily adhere to form large particles in the ambient air. Furthermore, large-particle salts would be expected to settle and deposit near the project site, which could result in additional impacts to land or water resources. In the absence of test data demonstrating that larger particles occur and remain airborne and specific cooling tower deposition analysis and mitigation, staff must assume that 100 percent of the TDS would be emitted to the ambient air as PM_{10}.

Project Operating Emissions

Air emissions will be generated from operating the major project components. **AIR QUALITY Tables 10 and 11** summarize the maximum (reasonable worst-case) estimated levels of the different criteria pollutants associated with project operation.

The assumptions used in calculating the emissions in the table include (Palomar 2001a, AFC Appendix E.3 Table E.3-1):

- anticipated regulatory limits for NOx, CO, and ammonia slip;
- manufacturer specified emission factors for PM_{10} and VOC;
- the facility operating up to a maximum of 8,760 hours per year;
- a range of load conditions (50 percent to 100 percent, with or without duct firing) and ambient temperatures (20°F to 110°F); and
- operating scenarios generating maximum annual emissions, based on the following assumptions (Palomar 2001a, AFC p. 5.2-22):
    a. annually: 50 extended startups (four-hour duration) and 182 regular startups (two-hour duration), would occur for each combustion turbine, amounting to 564 annual hours in a startup mode for each CTG. The remainder of the operating year would include 232 shutdowns (half-hour duration) with 6,080 hours of base load operation without duct burners and 2,000 hours of full load operation with duct burners. No downtime was assumed.
    b. concurrent operation of the cooling tower.

The proposed project's hourly emissions of criteria air pollutants are shown in **AIR QUALITY Table 10**. As **Table 10** shows, the highest NOx, CO, and VOC emissions occur during startups and shutdowns, because the pollution control devices are not at optimal operating conditions. **Tables 10 and 11** do not show direct $PM_{2.5}$ emissions because no established methodology exists for quantifying these emissions from all of the proposed sources. Although it is known that a substantial portion of the particulate matter formed during combustion of natural gas is likely within the $PM_{2.5}$ subset of PM_{10}, more specific estimates of the $PM_{2.5}$ emission rates are not available.

AIR QUALITY Table 10
Palomar Energy, Average Hourly Operational Emissions
(pounds per hour, lb/hr)

Operational Source/Profile	NOx	PM_{10}(a)	CO	SOx(a)	VOC(a)
Each CTG/HRSG – Extended/Cold Start (avg hourly emissions for 4 hour duration)	25.0	14.0	450.0	4.5	12.5
Each CTG/HRSG – Regular/Warm Start (avg hourly emissions for 2 hour duration)	35.0	14.0	230.0	4.5	18.5
Each CTG/HRSG – Shutdown (half-hour duration)	25.0	5.6	160.0	1.3	12.0
Each CTG/HRSG (@ 20ºF, 50 percent no duct burning)	8.5	11.1	10.3	2.6	2.6
Each CTG/HRSG (@ 20ºF, 100 percent w/ duct burning)	14.9	14.0	18.1	4.5	7.3
Each CTG/HRSG (@ 62ºF, 100 percent no duct burning)	12.5	11.1	15.3	3.8	3.8
Each CTG/HRSG (@ 62ºF, 100 percent w/ duct burning)	13.9	13.8	16.9	4.2	6.8
Each CTG/HRSG (@ 110ºF, 100 percent w/ duct burning)	13.2	14.0	16.1	4.0	6.8
Total Cooling Tower (b)	---	1.3	---	---	---

Source: AFC Table 5.2-8 (Palomar 2001a), Data Response 7 (Palomar 2002b), with independent staff estimate for cooling tower.

Notes: (a) Emissions of PM_{10} and SOx are a function of quantity of fuel burned, thus they will be highest when the combustors and duct burners operate at maximum fuel consumption.

(b) Staff conservatively anticipates 100 percent of cooling water TDS converts to PM_{10} emissions.

AIR QUALITY Table 11 summarizes the maximum annual criteria pollutants emissions from the project assuming a 8,760-hour operating scenario identified by the applicant (Palomar 2001a, AFC p. 5.2-22). Annual emissions are estimated based a projected number of startup/shutdown sequences and a projected range of full and partial load operation with and without duct firing, as described above.

AIR QUALITY Table 11
Palomar Energy, Estimated Annual Operational Emissions
(tons per year, tpy)

Operational Source	NOx	PM_{10}	CO	SOx	VOC
CTG/HRSG Group (tpy)	124.4	102.0	319.1	33.1	47.3
Cooling Tower (tpy)	---	5.7	---	---	---
TOTAL	**124.4**	**107.7**	**319.1**	**33.1**	**47.3**

Source: AFC Table 5.2-11 (Palomar 2001a), Data Response 7 (Palomar 2002b), with independent staff estimate for cooling tower.

(a) Assumes annual schedule of CTG startups, shutdowns, and operating levels identified above. Also includes full-time operation of the cooling tower.

Startup Emissions

Depending on how long either turbine has been shut down, up to four hours may be required to bring a CTG up to normal conditions, and startups could occur at any time. During startup, emission characteristics are different due to the variability of fuel-air mixtures in the combustors and temperatures in the control equipment. For these reasons, NOx and CO emissions vary substantially because of the variable control efficiency during startup. Emissions of PM_{10} and SOx are less variable because they depend on the CTG fuel rate and load. The emissions that the applicant anticipates during startup events are summarized in **AIR QUALITY Table 10**, above.

Ammonia Emissions

Due to the high temperatures in the turbine combustors and the need to control NOx emissions, significant amounts of ammonia will be injected into the flue gas stream to activate the SCR system. Not all of this ammonia will mix with the flue gases to reduce NOx. A portion of the ammonia will pass through the SCR and will be emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. The applicant has committed to an ammonia slip no greater than 10 ppm (Palomar 2001a, AFC p. 5.2-15). At 10 ppm of ammonia slip, approximately 28 pounds of ammonia would be emitted into the atmosphere per CTG/HRSG each hour (Palomar 2001a, AFC Appendix Table E.3-4). Staff anticipates that lower ammonia slip levels would occur with proper operation and well-maintained equipment, for example with fresh catalyst surfaces early in the life of the project, and that levels below 5 ppm would be achievable on a routine basis.

INITIAL COMMISSIONING

The initial commissioning of a power plant refers to the time frame between the completion of the construction and the reliable production of electricity for sale on the market. Because this time allows fundamental testing of the system, operating emission limits usually do not apply during the initial commissioning procedures. Normally, during the initial testing during commissioning the post-combustion control systems (i.e., SCR system and oxidation catalyst) may not be fully installed or operational. This normally leads to elevated levels of NOx and CO emissions.

The applicant has identified a reasonable worst-case commissioning scenario that would define the extent of the increased emissions during approximately the first 300 hours of operation for each unit (Palomar 2001a, AFC p. 5.2-19). Commissioning would involve six basic tests: (1) full speed, no load tests, without SCR in operation; (2) steam blows, without SCR in operation; (3) part load tests for combustor tuning, without SCR in operation; (4) full load tests, without SCR in operation; (5) full load tests, for SCR tuning; and (6) full and peak load tests, with SCR operational. On average, the emissions that would occur during the commissioning period would be substantially less than what could occur during the maximum single hour without control, and the plant is not expected to be operated at these high emission rates for sustained periods (Palomar 2002b, Data Response 5). **AIR QUALITY Table 12** shows the maximum single-hour and total emissions for the 300 hours that could occur during the commissioning period.

AIR QUALITY Table 12
Palomar Energy, Estimated Commissioning Emissions (lb/hr and total tons)

Commissioning Activity	NO_x	PM_{10}	CO	SOx	VOC
Maximum Hourly per CTG (lb/hr)	450	14	2,000	4.5	14.7
Total Commissioning (two CTGs, 300 hrs) (tons)	135	14	600	4.5	4.4

Source: AFC p. 5.2-18 and 19 (Palomar 2001a), and Data Response 5 (Palomar 2002b).

The PM_{10} and SO_2 emissions during from commissioning vary as a function of the fuel input. As such, they would be expected to be similar to range of emissions anticipated during normal operation. The applicant conservatively assumes that both gas turbines could simultaneously undergo commissioning tests. Typically these tests occur on one turbine at a time (Palomar 2002b, Data Response 6).

PROJECT 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. The analysis is a refined approach that uses hour-by-hour meteorological data collected in the vicinity of the project site.

The applicant used the U.S. EPA's Industrial Source Complex (ISC) Model, version 00101 and AERMOD, version 99351, to estimate the impacts of NOx, PM_{10}, CO and SOx emissions resulting from project construction and operation, as well as cumulative impacts during operation. The ISC model is a steady-state Gaussian plume model, appropriate for regulatory use that can be used to assess pollution concentrations from a wide variety of sources associated with an industrial source complex. In contrast, AERMOD allows sequential meteorology and integration of terrain data to characterize plume spreading over elevated terrain. These improvements make AERMOD attractive for use in elevated terrain. The applicant used three years (1998-2000) of meteorological data from a station in Escondido as approved by the SDAPCD. Staff reviewed this meteorological data and found one hour of data in 1998 that may be flawed. The methodology of the staff assessment takes the flawed hour of data into consideration so that results are accurately portrayed.

For the annual and one-hour impacts of NO_2 during construction and commissioning activities, the applicant provided a refined modeling analysis of NOx emissions using a post-processor for the ozone limiting method (OLM). This method calculates the maximum NO to NO_2 conversion using hour-by-hour ozone and NO_2 background concentrations to determine the project-plus-background one-hour NO_2 concentrations. Using OLM assumes that 10 percent of the exhaust NOx is NO_2 and that, over the hour, the available ozone allows a 100 percent conversion of the remaining NO to NO_2. This method somewhat over-predicts NO_2 concentrations in that it does not consider mixing or limiting quantities of ozone consumed in the reaction. The OLM is a method accepted by the U.S. EPA and CARB for one-hour NO_2 modeling, and use of a post-

processor for hour-by-hour concentrations allows accurate predictions of annual average NO_2.

The applicant's modeling analyses are first described in the modeling protocol (Palomar 2001a, AFC Section 5.2.3.2 and AFC Appendix E.4) with revisions to the scenarios for commissioning and construction modeling in updated analyses (Palomar 2002b, Data Responses 6 and 8).

CONSTRUCTION IMPACTS

The applicant modeled the emissions of the construction activities under two scenarios. Construction at the Palomar Energy Project site after it is graded for the ERTC is addressed in the applicant's primary analysis (Palomar 2001a, AFC Table 5.2-12). Because that assessment did not include the ERTC grading of the site, the applicant also presented an analysis for impacts related to PA1 site development (Palomar 2001a, p. 5.2-46 and 47). The construction sources were modeled based on an assumption that peak hourly emissions could occur at any time during an 11.5 hour work day (11 hours of equipment operation with half-hour setup each day), although the applicant has indicated that heavy equipment activity would normally follow an eight hour/day schedule (Palomar 2002b, Data Response 8). This assessment shows the highest impact that would occur under either schedule.

AIR QUALITY Table 13 summarizes the results of the analysis for construction activities. The total impact is the sum of the existing background condition plus the maximum impact related to project activity as predicted by the modeling analysis. The values in **bold** in the impacts and background columns represent values that equal or exceed the relevant ambient air quality standard.

The analysis of construction impacts including grading reveals that impacts for PA1 heavy-equipment operation and earthwork activity could cause new violations of the one-hour NO_2 standards and contribute to existing violations of the state-level PM_{10} standards. These results, however, do not take into account mitigation measures that may eventually be applied to the Palomar Energy or ERTC projects.

AIR QUALITY: Table 13
Palomar Energy, Ambient Air Quality Impacts from Construction
(µg/m^3)

Pollutant	Averaging Period	Project Impact (a)	Back-ground	Total Impact	Limiting Standard	Type of Standard	Percent of Standard
PM_{10}	24-hour	**154**	**74**	**228**	50	CAAQS	**456**
	AGM	5.1	28.5	**34**	30	CAAQS	**112**
	AAM	5.1	30.0	35	50	NAAQS	70
NO_2	one-hour	**729**	79 (b)	**808**	470	CAAQS	**172**
	Annual	65.6	--- (b)	66	100	NAAQS	66
CO	one-hour	8,910	11,870	20,780	23,000	CAAQS	90
	8-hour	3,410	6,123	9,533	10,000	NAAQS	95
SO_2	one-hour	168	397	565	650	CAAQS	86
	3-hour	168	397	565	1,300	NAAQS	43
	24-hour	24.6	53.0	78	105	CAAQS	74
	Annual	0.8	8.0	9	80	NAAQS	11

Source: AFC Table 5.2-12 for long-term impacts and AFC Table 5.2-29 for short-term impacts during PA1 grading (Palomar 2001a); Data Response 8 (Palomar 2002b).

Notes:

(a) Impacts reflect reasonable worst-case conditions caused by either 8-hour or 11-hour daily construction activity.

(b) Hourly and annual NO_2 impacts were calculated using an OLM post-processor that incorporates hour-by-hour NO_2 background conditions.

New violations of the one-hour NO_2 standards would be a significant impact that warrants mitigation. Due to existing violations of the state 24-hour PM_{10} standard that occur in the Escondido area, construction activities would also cause significant impacts from direct emissions of PM_{10}. Direct impacts of NO_2, CO, and SO_2 would not be significant because construction of the project would not cause or contribute to a violation of these standards. Significant indirect impacts would also occur for PM_{10} and ozone because construction emissions of PM_{10} precursors and ozone precursors would contribute to existing violations of these standards. Mitigation for construction emissions of PM_{10}, NOx, SO_2, and VOC is appropriate to reduce direct impacts to NO_2 and PM_{10} and indirect impacts to PM_{10} and ozone.

OPERATION IMPACTS

The following section discusses the ambient air quality impacts that could occur during routine operation throughout the life of the project and initial commissioning.

Operational Modeling Analysis

A refined modeling analysis was performed to identify off-site criteria pollutant impacts from operational emissions of the proposed project. Separate impact modeling analyses were conducted for maximum operating and startup/shutdown scenarios, respectively. The operating profiles are explained in **AIR QUALITY Tables 10 and 11** above. The maximum short-term and annual emission impacts for all receptors are shown in **AIR QUALITY Table 14**.

AIR QUALITY Table 14
Palomar Energy, Ambient Air Quality Impacts from Routine Operation
(µg/m^3)

Pollutant	Averaging Period	Project Impact	Back-ground	Total Impact	Limiting Standard	Type of Standard	Percent of Standard
PM_{10}	24-hour	4.8	**74**	**79**	50	CAAQS	**158**
	AGM	0.8	28.5	29	30	CAAQS	98
	AAM	0.8	30.0	31	50	NAAQS	62
NO_2	one-hour	24.8	191	215	470	CAAQS	46
	Annual	0.7	44	45	100	NAAQS	45
CO	one-hour	30.1	11,870	11,900	23,000	CAAQS	52
	8-hour	10.6	6,123	6,134	10,000	NAAQS	61
SO_2	one-hour	7.5	397	405	650	CAAQS	62
	3-hour	5.4	397	402	1,300	NAAQS	31
	24-hour	1.4	53.0	54	105	CAAQS	52
	Annual	0.2	8.0	8	80	NAAQS	10

Source: AFC Table 5.2-14 (Palomar 2001a).

Notes: Short-term NO_2 and CO impacts do not reflect startup conditions. During startup conditions maximum impacts would be one-hour NO_2: 266 µg/m^3; one-hour CO: 1,250 µg/m^3; eight-hour CO: 388 µg/m^3 (Palomar 2001a, AFC Table 5.2-16). With background conditions included, startup conditions would not cause or contribute to violations of the NO_2 or CO standards.

Direct impacts of PM_{10} would be significant since they would contribute to existing violations of the state-level 24-hour standard. Direct impacts of NO_2, CO, and SO_2 would not be significant because the project would not cause or contribute to a violation of these standards. Mitigation is appropriate to reduce significant direct impacts of PM_{10}. Secondary, or indirect, impacts caused by emissions of precursors to PM_{10} and ozone are discussed further below. There is also a potential for $PM_{2.5}$ impacts to occur because the project would also emit this contaminant directly; however, the magnitude of potential $PM_{2.5}$ impacts are not quantified because no established methodology exists for quantifying $PM_{2.5}$ emissions or characterizing the complex interaction of $PM_{2.5}$ precursors in the ambient air. Mitigation could be provided by mitigating combustion-related PM_{10}, which includes $PM_{2.5}$, and mitigating reactive precursors that can lead to $PM_{2.5}$.

Secondary Pollutant Impacts

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

As identified above, PM_{10} impacts would be significant due to direct emissions of PM_{10}. Significant indirect impacts would also occur for PM_{10} and ozone because routine

operational emissions of precursor pollutants would contribute to existing violations of the PM_{10} and ozone standards. Along with mitigation that is appropriate to reduce significant, direct impacts of PM_{10}, additional mitigation for emissions of NOx, SO_2, and VOC is needed to reduce indirect impacts to PM_{10} and ozone. Mitigation for these pollutants would also help to reduce potential $PM_{2.5}$ impacts.

Fumigation Impacts

The applicant did not provide a specialized analysis of impacts during fumigation conditions. Fumigation conditions are generally short-term in nature and only have the potential to influence concentrations within a one-hour averaging period. The modeling effort for routine operation adequately characterizes impacts during fumigation conditions through the use of the ISCST3 model, which provides conservative maximum one-hour estimates of concentrations on terrain at or below stack heights. The results are shown in **AIR QUALITY Table 14**. These results do not show any contribution to violations of any short-term (one-hour) standards.

Initial Commissioning Impacts

The applicant modeled the initial commissioning impacts based on the anticipated emissions information discussed above (**AIR QUALITY Table 12**). Because startup conditions and routine operations would cause the same maximum hourly emission rates of PM_{10} and SO_2 at similar exhaust conditions, staff determined that the modeling for startups and routine operations (**AIR QUALITY Table 14**) adequately characterizes PM_{10} and SO_2 impacts from commissioning activities.

The commissioning modeling results are provided in **AIR QUALITY Table 15**. Direct and indirect impacts for all pollutants during initial commissioning would be similar to the impacts that would occur during routine operations.

AIR QUALITY Table 15
Palomar Energy, Ambient Air Quality Impacts during Commissioning ($\mu g/m^3$)

Pollutant (a)	Averaging Period	Project Impact	Back-ground	Total Impact	Limiting Standard	Type of Standard	Percent of Standard
NO_2	one-hour	270.4	--- (b)	270	470	CAAQS	58
CO	one-hour	5,949	11,870	17,819	23,000	CAAQS	77
	8-hour	2,269	6,123	8,392	10,000	NAAQS	84

Source: Data Response 6 (Palomar 2002b).

Notes:

(a) Because emissions of PM_{10} and SO_2 vary depending on fuel flow, impacts of these pollutants during initial commissioning would be similar to those during routine operations.

(b) Hourly NO_2 impacts were calculated using an OLM post-processor that incorporates background conditions.

VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions is required by the Prevention of Significant Deterioration (PSD) program in SDAPCD Rule 20.3(d)(3). The Palomar Energy Project is subject to visibility requirements because of proposed NOx, CO, and PM_{10} emissions (SDAPCD 2002b). In response to these requirements, the applicant

prepared a visibility analysis for the nearest Class I areas. There are two Class I areas within 100 km (62 miles) of the Palomar Energy site managed by the U.S. Forest Service (USFS):

1. Agua Tibia Wilderness Area, USFS, 19 miles (31 km)
2. San Jacinto Wilderness Area, USFS, 50 miles (81 km)

The visibility analysis includes two components: (1) a regional haze analysis to determine the change in light extinction in distant Class I areas, and (2) a long-range, coherent plume impact analysis. The Federal Land Manager (USFS) was provided opportunity to comment on the analysis with a copy of application filed with the SDAPCD; however no comments were received by the SDAPCD before publishing the Preliminary Determination of Compliance (SDAPCD 2002b).

The regional haze analysis used the CALPUFF model for Class I areas greater than 50 km (31 miles) away, in this case the San Jacinto Wilderness Area. The model estimates ambient concentrations of particulate nitrate, particulate sulfate, and PM_{10} in conjunction with a relative humidity adjustment to determine the change in visibility caused by project emissions of NOx, SO_2, and PM_{10}. The analysis found that the project would cause less than a 5 percent change in light extinction when compared to background conditions (Palomar 2001a, AFC Table 5.2-19).

The long-range, coherent plume impact analysis used a U.S. EPA PLUVUE II (Level-3) screening methodology. With this approach, project emissions were shown to pass the visibility screening criteria at the Agua Tibia Wilderness Area (Palomar 2001a, AFC Table 5.2-18). Because the analyses showed that the accepted criteria would not be exceeded, the project's visibility impacts on Class I areas would be considered insignificant by the Federal Land Managers.

MITIGATION

Applicant's Proposed Mitigation

Construction Mitigation

The City of Escondido Municipal Code requires that activities be managed so that dust is reasonably controlled, and SDAPCD Rules 50 and 51 have general prohibitions for limiting visible emissions and nuisances. To comply with these rules, and to reduce construction impacts of PM_{10}, the applicant proposes to prepare project-specific construction plans to address: (1) onsite fugitive dust control, (2) vehicle track-out control, and (3) diesel construction equipment mitigation. These plans would be submitted to the Energy Commission prior to commencing construction (Palomar 2001a, AFC p. 5.2-43). At this time, the contents of the applicant's mitigation plans are unknown. However, the applicant's emissions estimates and the impacts presented above assume implementation of certain emission control measures that would typically be implemented (e.g., use of California's low-sulfur diesel fuel, use of new engines that comply with U.S. EPA off-road equipment emission standards from 1996, the use of catalyzed particulate filters on selected pieces of diesel-fueled equipment, and watering

exposed surfaces while minimizing track-out of mud to surrounding roads) (Palomar 2002a).

Operations Mitigation

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

Combustion Turbine

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

Flue Gas Controls

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

Cooling Tower

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

Emission Offsets

In addition to emission control strategies included in the project design, SDAPCD Rule 20.3(d)(5) requires the applicant to offset emissions of NOx to reduce ozone impacts. The applicant plans to offset NOx emissions with stationary source ("Class A") emission reduction credits (ERCs) that would be exchanged as allowed by Rule 20.3. The NOx offset liability is defined by an offset ratio of 1.2-to-1.0, which can be achieved by either surrendering NOx ERCs or interpollutant trading VOC ERCs at an additional 2-to-1 interpollutant trading ratio. Because the SDAPCD is a federal nonattainment area for only ozone (precursors NOx and VOC), and the Palomar Energy Project does not qualify as a major source of VOC, the SDAPCD offset liability applies only to NOx. The SDAPCD does not require the applicant to offset emissions of any other pollutants. **AIR QUALITY Table 16** shows the project emissions offset liability and the offset requirements defined by the SDAPCD.

AIR QUALITY Table 16
Palomar Energy, Offset Liability and Proposed Offset Strategy

Pollutant	Offset Liability	Proposed Offset Strategy	Offset Ratio	SDAPCD required ERCs
NOx, tpy	124.4	NOx-Equivalent ERCs	1.2	149.3
PM_{10}, tpy	107.7	Not required by SDAPCD.	---	---
CO, tpy	---	None necessary.	---	---
SOx, tpy	33.1	Not required by SDAPCD.	---	---
VOC, tpy	47.3	Not required by SDAPCD.	---	---

Source: PDOC, p. 34 (SDAPCD 2002b).

Notes: Emissions of PM_{10}, SOx, and VOC (PM_{10} and ozone precursors) do not need to be offset per District rules, but will need to be offset to satisfy CEQA requirements.

NOx-Equivalent Offsets

Palomar Energy has stated that it intends to comply with the offset program requirements, as illustrated by SDAPCD in the Preliminary Determination of Compliance (SDAPCD 2002b). Updated details of the applicant's offset strategy have also been provided in filings with the Energy Commission, most-recently on July 17, 2002 (Palomar 2002d). The most-recent filings indicate that Palomar Energy holds enough NOx and VOC ERCs to account for approximately 60 percent of the NOx liability, or 87.5 tpy of NOx and NOx-equivalent ERCs. The remainder of the ERCs have not yet been fully identified or purchased.

The applicant has acquired the following amounts of NOx and NOx-equivalent ERCs (Palomar 2002d). The amounts shown are the ERC face value prior to any distance ratio:

- 17.5 tpy, ERC #000111-01, combustion turbine shutdown
- 0.15 tpy, ERC #000111-02, combustion turbine shutdown (from 0.3 tpy VOC)
- 7.6 tpy, ERC #010228-01, process modification (from 15.2 tpy VOC)
- 20.8 tpy, ERC #921291-01, combustion turbine shutdown
- 0.5 tpy, ERC #921291-02, combustion turbine shutdown (from 1.0 tpy VOC)
- 10.5 tpy, ERC #020118-01, partial shutdown of coating facility (from 21.0 tpy VOC)
- 3.6 tpy, ERC #020620-01, and -02, combustion engine shutdown
- 26.8 tpy, No ERC yet, under contract with Naverus, diesel engine replacement

Prior to discounting the ERCs with the distance ratios, the applicant's ERCs reflect regional emission reductions of approximately 68.7 tpy NOx and 37.5 tpy VOC, or 87.5 tpy of NOx and NOx equivalent.

Additional Mitigation: Mitigation Fee

The applicant originally proposed a "mitigation fee" as an approach for PM_{10} mitigation (Palomar 2002a, p. 5.2-52). The applicant points out that a similar mitigation fee strategy was used in the Otay Mesa siting case in the amount of $1.2 million (99-AFC-5, Final Commission Decision, April 2001). A funding plan for the Palomar Energy Project was ultimately received May 8, 2002, after staff issued the second round of Data Requests (May 3, 2002). The applicant's proposed fee for Palomar Energy depends on a ratio of anticipated, direct PM_{10} emissions (i.e., not including precursors) from the two projects. The applicant proposed to provide funds of $787,500 to the SDAPCD for a range of possible control programs (Palomar 2002c, Data Response 14).

The air quality benefits that could be provided by the proposed mitigation fee are unknown. The applicant investigated numerous opportunities for emission reductions in the Escondido area including: upgrading heavy-duty diesel-fueled engines on local school buses or garbage trucks, controlling dust at nearby landfills, or increasing street sweeping in Escondido. After contacting the Escondido Union High School District, Escondido Disposal, and the City of Escondido Department of Public Works, the applicant found few local diesel-fueled vehicles that would be eligible for particulate-filter retrofits. Local school buses may provide opportunities for complete diesel-engine replacement. The applicant identified three buses within the high school district that could be replaced with "Green Diesel technology" (a trademark) to provide PM_{10} reductions (Palomar 2002c, Data Response 14). For whichever program is ultimately selected, especially diesel-engine upgrades or replacements, benefits for pollutants other than PM_{10} could also occur (e.g., NOx or SO_2 reductions could occur if diesel engines are replaced with natural gas-fired engines). Because the specific control programs would need to be selected and managed by the SDAPCD, the applicant did not attempt to quantify the actual emission reductions or air quality benefits that could be associated with payment of the fee. The SDAPCD has not indicated how it would use the proposed funds. The timing and permanence of any emission reductions that may be achieved through use of the mitigation fee is also unknown.

ADEQUACY OF PROPOSED MITIGATION

Construction Mitigation

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

equipment exhaust emissions also depends largely on the vigilance of construction personnel to operate equipment properly.

The applicant's proposal to prepare construction management plans would likely provide mitigation for direct PM_{10} impacts, but the impact would remain significant because increases in PM_{10} concentrations could contribute to continuing existing violations of the PM_{10} standards. Direct impacts of NO_2 would also remain significant because the applicant's mitigation strategies would not substantially reduce NOx emissions from equipment. Similarly, indirect impacts for PM_{10} and ozone would continue to be significant because equipment exhaust emissions of PM_{10} and ozone precursors could contribute to increases in PM_{10} and ozone concentrations. Additional mitigation is necessary to reduce the NO_2 impacts and the direct and indirect impacts to PM_{10} and ozone, as discussed below under **Staff Proposed Mitigation**.

Operations Mitigation

Combustion Turbine/Flue Gas Controls

Energy Commission staff is concerned that the SDAPCD BACT determination in the PDOC for gas turbine emissions of NOx and CO may be inconsistent with current U.S. EPA recommendations. As discussed in the **AIR QUALITY Project Description** above, the proposed emissions with the controls in place would be 2.0 ppm NOx, 4.0 ppm CO, and 3.0 ppm VOC on three-hour averages with ammonia slip levels below 10 ppm. Recommendations from U.S. EPA on recent projects reviewed by Energy Commission staff indicate that 2.0 ppm may actually be achievable for all three pollutants on a one-hour basis with ammonia slip levels below 5 ppm. Guidance from CARB also shows that five ppm ammonia slip should be achievable (CARB 1999). The PDOC does require VOC to be reduced to 2.0 ppm and notes that a 2.0 ppm NOx limit on a one-hour basis may be appropriate during those times when duct firing does not occur, but it does not indicate that further reductions of CO or ammonia slip could be achieved. If the SDAPCD takes the position that the lower emission limits are achievable and demonstrated in practice, the limits in the PDOC would need to be revised. As such, additional control may ultimately be necessary to satisfy LORS (SDAPCD 2002b). The need for additional control will be established after the Final Determination of Compliance is released.

Secondary Ozone Mitigation

The applicant proposes that compliance with the SDAPCD offset requirements would fully mitigate project impacts to ozone (Palomar 2002b, Data Response 15). The SDAPCD new source review program is designed to allow new source growth while providing gradual air quality benefits to eventually achieve attainment of the ozone standards. The interpollutant and intrapollutant trading ratios and trigger levels for offset requirements are part of the local strategy to attain the ozone standards.

The applicant is required by the SDAPCD to secure and surrender 149.3 tpy of NOx-equivalent credits (1.2 times 124.4 tpy), but at this time has only secured a portion of these credits. The task of creating emission reduction credits and purchasing them is time consuming and especially competitive in the San Diego region. The applicant holds only 68.7 tpy NOx and 37.5 tpy VOC for a total of 87.5 NOx-equivalent credits

(Palomar 2002d), and is short 61.8 tpy of NOx. Because the applicant's offset acquisitions for NOx-equivalent ERCs are incomplete (SDAPCD 2002b, Palomar 2002d), the SDAPCD requirements are not satisfied.

The need for CEQA mitigation of ozone precursors is also not satisfied. The applicant's ERC acquisitions to date would provide only 106 tpy of combined NOx and VOC emission reductions (68.7 tpy NOx + 37.5 tpy VOC). Because new project emissions of NOx and VOC would total 172 tpy, an additional 66 tpy of NOx or VOC is necessary for adequate CEQA mitigation. If sufficient quantities of emission reduction credits are eventually acquired and surrendered, secondary ozone impacts could be mitigated with the ERCs to a level of insignificance. At this time, staff considers the secondary ozone impacts to be inadequately mitigated.

AIR QUALITY Table 17 summarizes the SDAPCD offset liability and offsets required versus the CEQA mitigation sought by staff.

AIR QUALITY Table 17
Palomar Energy, Offset Liability and Residual Impact

Pollutant	SDAPCD Offset Liability	CEQA Offset Liability	Offsets Acquired (a)	Offsets Reallocated for CEQA Mitigation	Remaining Liability (b)
NOx, tpy	124.4	124.4	68.7 ERCs	---	**62 ERCs**
PM_{10}, tpy	---	107.7	---	---	See Below
SOx, tpy	---	33.1	---	---	See Below
VOC, tpy	---	47.3	37.5 ERCs	---	See Below
CEQA Mitigation Plan					
Ozone Precursors, tpy (c)	---	172	106	106	**66 tpy**
PM_{10}/PM_{10} Precursors, tpy (d)	---	141	0	0	**141 tpy**

Source: PDOC, p. 34 (SDAPCD 2002b); with independent staff assessment

Notes:

a. The applicant's plan to acquire NOx/VOC ERCs is unfulfilled at this time; this summarizes the offsets (all ERCs) the applicant has acquired to date. Potential emission reductions from the "mitigation fee" are not quantifiable.

b. The remaining liability for NOx-equivalent ERCs is based on the SDAPCD requirement of 149 tpy as in **AIR QUALITY Table 16** above minus the NOx-equivalent ERCs acquired. VOC ERCs are discounted two-to-one.

c. Ozone precursors are total of NOx plus VOC.

d. PM_{10}/PM_{10} precursors are total of PM_{10} plus SOx.

Direct and Secondary PM_{10} Mitigation

Staff has found significant direct and secondary PM_{10} impacts, which potentially include $PM_{2.5}$, and has found that mitigation would be required for emissions of PM_{10} and PM_{10} precursors (i.e., NOx, SO_2, and VOC). If eventually fulfilled, staff anticipates that the applicant's offset strategy for NOx and VOC could mitigate NOx and VOC emissions sufficiently to avoid secondary PM_{10} impacts from these precursors. The applicant states that project SO_2 emissions would not measurably contribute to PM_{10} impacts (Palomar 2002b, Data Response 15).

The “mitigation fee” discussed above was proposed by the applicant as a response to staff finding significant PM_{10} impacts (Palomar 2002c, Data Response 14). As discussed above, the air quality benefits (including the quantity, timing, and permanence of any emission reductions) that could be achieved with the mitigation fee are unknown. This means that it is not possible to account accurately the environmental effects of the applicant’s proposed mitigation fee, and it is extremely difficult for staff to determine the efficacy of the plan to mitigate PM_{10} impacts.

Mitigation measures (such as providing fees for unspecified air quality mitigation purposes) that are not tied to specific action plans may not be adequate or effective in reducing project related impacts. Staff cannot rely on a plan of unknown efficacy in concluding that a significant impact will be mitigated. In order for staff to reasonably conclude that impacts will be mitigated, any mitigation measure should include realistic performance standards or criteria that will ensure the mitigation addresses the project’s effects. A reliable mitigation plan must include:

- a clear explanation of the plan’s objectives (e.g., an accounting of the PM_{10}/PM_{10} precursor emissions reductions to be provided or an illustration of the reduced exposure of receptors to local PM_{10} concentrations);
- a description of specific steps designed to provide the necessary reductions;
- how the implementation will occur;
- who is responsible for the implementation;
- where the implementation will occur; and
- the timetable for the implementation.

In the absence of such information, staff cannot reasonably assume that the proposed mitigation fee would have a high likelihood of reducing project impacts to a level of insignificance.

In the discussion that follows, staff uses the dual objectives of providing regional and local benefits for evaluating the efficacy of the proposed mitigation fee.

Regional PM_{10} Mitigation

Energy Commission staff would consider direct and secondary PM_{10} impacts to be adequately mitigated in the regional context if emission reductions of PM_{10} and PM_{10} precursors could be achieved in quantities equaling the amount of the project emissions. Without considering the potential benefits of the mitigation fee, the project would cause PM_{10} and PM_{10} precursor emissions totaling 141 tpy (107.7 tpy PM_{10} + 33.1 tpy SO_2). Thus, staff considers 141 tpy to be the total regional PM_{10} liability for the Palomar Energy Project. This liability is summarized in **AIR QUALITY Table 17**, above.

The PM_{10} liability could be offset through acquisition of emission reduction credits, if such were available. The ERC market in the San Diego region is severely constrained. Based on Energy Commission staff analysis conducted for the Otay Mesa case (99-AFC-5), credits for PM_{10} or PM_{10} precursors in the San Diego region would likely have cost a minimum of $10,000 per tpy. Since the time of the Otay Mesa case, the

availability of credits has decreased, and the average cost of ERCs for all pollutants has steadily increased. The median cost of PM_{10} ERCs state-wide in 2001 was approximately $25,000 per tpy, and the average cost was over $46,000 per tpy. This a dramatic increase over the state-wide average cost for PM_{10} in 1999, which was $10,400 per tpy. Although no recent transactions in the San Diego region have involved PM_{10}, ERCs for other pollutants in 2001 cost between $4,300 per tpy VOC and $38,500 per tpy NOx (CARB 2002b). If PM_{10} ERCs could be acquired in San Diego County by Palomar Energy for $25,000 per tpy, which would be a cost far below the average state-wide 2001 market rate, the proposed mitigation fee of $787,500 would only provide roughly 32 tpy of credits, far short of the 141 tpy PM_{10} liability.

Localized PM_{10} Mitigation

In the local context, staff would consider the direct and indirect PM_{10} impacts of the project to be adequately mitigated if local air quality benefits would be provided by the mitigation plan. The applicant's proposed fee could be used locally for programs such as upgrading heavy-duty diesel-fueled engines on local school buses or garbage trucks, controlling dust at nearby landfills, or increasing street sweeping in Escondido. Staff recognizes that characterizing the ambient benefit that could be achieved with these programs is extremely difficult because of the variability of existing sources available for control and their wide range of orientation to receptors. In spite of this difficulty, staff aims to correlate use of the fee with a benefit.

For example, an empirical correlation can be made to roughly assess the benefits of controlling particulate from diesel vehicles, should this option be pursued. Ambient concentrations of diesel exhaust particulate (a known carcinogen) near facilities with idling school buses (e.g., 20 buses) or a truck stop (e.g., 25 trucks per hour) can range up to approximately 0.5 $\mu g/m^3$, depending on the frequency of vehicle-visits and the proximity of receptors (CARB 2000). If diesel particulate emissions from sources like these could be eliminated by the mitigation plan, the correlating air quality benefit would be a PM_{10} reduction of approximately 0.5 $\mu g/m^3$ for the maximally exposed receptors. Along with providing localized improvements in PM_{10} concentrations, substantial secondary benefits could include greatly reduced health risks by eliminating the diesel particulate carcinogen and advancing the adoption of lower-emitting vehicle technologies into the marketplace. The applicant has suggested using the fee for replacing diesel-fueled vehicles with either "Green Diesel" or compressed natural gas vehicles, but no specific strategy has been proposed.

Without identification of specific vehicle fleets that could be controlled, along with the locations and timing of these reductions, staff cannot conclude that the fee would provide any local air quality benefit. Additional mitigation is necessary to address PM_{10} impacts, as discussed below under **Staff Proposed Mitigation**.

STAFF PROPOSED MITIGATION

Construction Mitigation

Staff proposes specific mitigation to reduce construction emissions of PM_{10}, VOC, and NOx to avoid NO_2, PM_{10}, and ozone impacts. Much of the uncertainty in the effectiveness of the applicant's proposed strategy for construction mitigation is due to

varying degrees of vigilance on the part of construction personnel. Staff's proposed Conditions of Certification (**AQ-SC3** and **AQ-SC4**) would require the applicant to prepare and adhere to a Fugitive Dust Mitigation Plan and a Diesel Construction Equipment Mitigation Plan. Because SO_2 is also a precursor to PM_{10}, one aspect of the Diesel Construction Equipment Mitigation Plan would require consideration of ultra-low sulfur diesel fuel. In order to confirm implementation of these plans, staff proposes rigorous monitoring and recordkeeping (**AQ-SC2**) of certain environmental parameters that would be used to indicate whether a high degree of day-to-day vigilance is being maintained. Each of these responsibilities would be coordinated by personnel specifically approved by the Energy Commission to fill the role of Construction Mitigation Manager (**AQ-SC1**).

Direct impacts of NO_2 would be caused by construction equipment operated for the mass grading of PA1. The applicant anticipated that mass grading for the project site would occur during an intensive three-month work period (approximately 70 work days). Maximum one-hour NO_2 impacts during that period were predicted to be approximately two-times (172 percent) higher than the one-hour NO2 CAAQS. In order to ensure that no violation of the one-hour NO_2 CAAQS occurs during construction, staff recommends extending the duration of PA1 excavation and grading to effectively cut the overall daily average emission rate of NOx in half (**AQ-SC5**). This would reduce the maximum one-hour NO_2 concentration during this phase of construction to a level that would not cause a violation.

With the implementation of the staff-recommended construction mitigation measures, the NO_2, PM_{10}, and ozone impacts from the construction of the Palomar Energy Project can be reduced to a level of insignificance.

Operations Mitigation

The ozone precursor liability is 172 tpy, and the offsets that would be used for mitigation are incomplete. Presently, the remaining project liability for ozone precursors is 66 tpy. Assuming proper offsets are eventually acquired and surrendered to satisfy the SDAPCD NOx-equivalent offset requirements, project impacts to secondary ozone would be substantially mitigated. Staff proposes that, in conjunction with their efforts to satisfy the District's offset requirements (i.e., a 62 tpy NOx shortfall), the applicant may eventually identify NOx plus VOC emission offsets in total amounts equivalent to 172 tpy. With implementation of this measure, secondary ozone impacts would be reduced to a level of insignificance.

The unmitigated liability for PM_{10} and PM_{10} precursors is 141 tpy. The proposed mitigation fee of $787,500 would not be adequate in providing regional PM_{10} benefits through emission reductions of stationary sources, even if such reductions could be found at a minimum cost. Assuming that a minimum cost of $25,000 per tpy is necessary to achieve stationary source emission reductions of PM_{10} or any PM_{10} precursors, the proposed mitigation fee should equal at least $3.53 million. Staff proposes this as minimum mitigation fee to provide PM_{10} benefits. Because the $3.53 million fee alone may not provide 141 tpy in regional emission reductions, staff would propose recordkeeping and reporting requirements to demonstrate that reductions of PM_{10} and PM_{10} precursors occur in the amount of 141 tpy.

Because localized PM_{10} impacts remain a concern, staff would also recommend that the mitigation fee be preferentially used to minimize local exposure to PM_{10} and diesel particulates. Staff recommends the retrofit and replacement of eligible local diesel-fueled vehicle engines to provide the benefits of reducing public and children's exposure to the diesel particulate carcinogen and advancing the adoption of lower-emitting vehicle technologies into the marketplace. To verify that the fee would be used locally, staff would require the applicant to secure a commitment from the SDAPCD that the funds would preferentially benefit the Escondido area.

Increasing the funds provided under the proposed mitigation fee, demonstrating the quantity of the emission reductions, and specifically directing the funds to local uses would address the PM_{10} liability and minimize the localized PM_{10} impacts of the project.

Until the applicant agrees to implement measures to obtain the required 141 tpy of PM_{10} and PM_{10} precursor emissions, staff will find that the proposed project has a significant air quality impact.

CUMULATIVE IMPACTS

Cumulative Sources: ERTC Construction

The Escondido Research and Technology Center would surround the Palomar Energy site, and ongoing development of the remainder of the ERTC site could occur simultaneously with construction or operation of the power plant. Because construction activities for the remainder of the ERTC industrial park could occur concurrently with project construction or operation emissions, the applicant reviewed the air quality impacts caused by development of the remainder of the ERTC (AFC pp. 5.2-46 to 47). The most severe air quality impacts during construction of the ERTC would occur early in the phasing of ERTC (first three months), when excavation and grading of PA1 could occur simultaneously with the grading for the remainder of the 186-acre industrial park. These impacts were analyzed above (**AIR QUALITY Table 13**). The cumulative construction impacts would be similar and would warrant similar mitigation. Staff-recommended mitigation for Palomar Energy Project construction would address this impact.

The activities related to the remainder of ERTC construction are currently being evaluated by the City of Escondido for CEQA purposes. The City of Escondido will develop a mitigation strategy to minimize or avoid these potential impacts during ERTC construction. The City published a Draft EIR for the ERTC (Escondido 2002a), which Energy Commission staff is reviewing to determine whether the remainder of ERTC construction impacts would be adequately mitigated.

Operational emissions from ERTC would occur simultaneously with Palomar Energy Project emissions after both projects are built, but only minor stationary sources are anticipated to be included with the ERTC. Any specific future stationary sources within ERTC are not foreseeable at this time because the future tenants are unknown. If major sources occur, they would be required to comply with SDAPCD permitting and

AQIA requirements. For these reasons, no permanent stationary sources at ERTC need to be included in the cumulative air quality analysis.

As identified above, Energy Commission staff is participating in the environmental review process for ERTC underway at the City of Escondido. As the City's environmental process progresses, Energy Commission staff will continue to work with City staff in fulfilling their obligation to identify and mitigate any significant air quality impacts related to the ERTC project.

Cumulative Sources: New Generation Facilities

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

The applicant obtained an inventory from SDAPCD identifying proposed and new sources within 10 kilometers (6.2 miles) of the Palomar Energy site that have not yet or only recently commenced operations (Palomar 2001a, AFC Section 5.2.6; Palomar 2002b, Data Response 17 and 18). Sources previously operating would be represented by the background conditions. Only two stationary sources were found to be eligible for the cumulative analysis: the CalPeak and RAMCO natural gas fired power plants, both under 50 MW in capacity. Because new generation facilities under 50 MW are exempt from the Energy Commission siting regulations, these projects may not be fully mitigated for emissions of PM_{10} and PM_{10} precursors, which are not offset through SDAPCD requirements. The maximum modeled cumulative impacts of the Palomar Energy Project with the other new generation facilities are presented below in **AIR QUALITY Table 18**.

AIR QUALITY Table 18
Palomar Energy, Ambient Air Quality Impacts from Cumulative Sources

Pollutant	Averaging Period	Cumulative Impact	Back-ground	Total Cumulative Impact	Limiting Standard	Type of Standard	Percent of Standard
PM_{10}	24-hour	5	**74**	**79**	50	CAAQS	**158**
	AGM	0.9	28.5	29	30	CAAQS	98
	AAM	0.9	30.0	31	50	NAAQS	62
NO_2	one-hour	33.5	191	224	470	CAAQS	48
	Annual	1	44	45	100	NAAQS	45
CO	one-hour	33.3	11,870	11,903	23,000	CAAQS	52
	8-hour	15.3	6,123	6,138	10,000	NAAQS	61

Source: AFC Table 5.2-27 (Palomar 2001a).

Note: The applicant did not analyze SO_2 impacts for cumulative sources. Because cumulative sources include only natural gas-fired energy facilities, the cumulative impacts would be similar to those presented in **AIR QUALITY Table 14**.

The total impact is conservatively estimated to be the maximum modeled impact plus the staff-recommended maximum existing background concentration from the years 1998 to 2001. **AIR QUALITY Table 18** shows that cumulative impacts would be similar to those that would occur under routine operation of the Palomar Energy project.

Natural Gas Supply and Emission Budgets

The cumulative growth in generation capacity in the San Diego region has two indirect air quality implications. First, because much of the new generation capacity relies on natural gas for primary energy, regional cumulative growth in natural gas demand has the potential to trigger increased emissions from generation facilities that are allowed to fire residual fuel oil during local natural gas shortages (allowed by SDAPCD Rule 69). Second, total emissions from new and existing electric generation facilities may not be consistent with the emission budgets allocated by the SDAPCD for these sources in the regional attainment strategy. This means that unmitigated cumulative emission increases in the generation sector could contribute to unplanned delays in the region's long-range progress towards attainment.

Gas supply curtailments in the San Diego region could necessitate fuel oil firing at the existing generation facilities that are permitted and equipped for firing alternative fuels (e.g., South Bay and Encina power plants). Much of the new generation capacity in the region is only capable of firing natural gas, which may increase the likelihood of curtailments and the frequency of curtailments that result in backup fuel oil firing. The extent that the Palomar Energy Project could contribute to additional regional gas curtailments is a subject of debate, and the indirect negative air quality consequences are even less well-documented (SDAPCD 2002a; Energy Commission Natural Gas Constraints Workshop Summary, January 2001; and Otay Mesa 99-AFC-5, Final Commission Decision, April 2001, p. 130 to 132).

To address the basic concern of adequate natural gas supply, infrastructure in the region is being upgraded to avoid local natural gas shortages (e.g., the pending

completion of the Baja Norte pipeline). Furthermore, cooperation to resolve the supply problems and possible air quality consequences in San Diego presently involves the energy facility operators, the SDAPCD, the Energy Commission, the Public Utilities Commission, and San Diego Gas and Electric. Based on the pending infrastructure improvements, the ongoing awareness of the regional problem, and the lack of a nexus between the proposed operation of Palomar Energy with other cumulative development and possible fuel oil firing at other facilities, staff concludes that attempting to characterize project-induced indirect air quality impacts caused by the constrained natural gas supply would be speculative. No further analysis is necessary.

Attainment of the ozone standards is managed by the SDAPCD through a long-range planning process that involves anticipating future changes in regional emissions. For example, the attainment strategy relies upon state- and federal- vehicle emission control programs to offset ongoing increases in mobile source activity. The Palomar Energy Project has the potential to cause previously unforeseen emissions of ozone precursors that, when combined with other cumulative energy projects, could exceed the emissions budgeted for achieving attainment. This staff assessment shows that project impacts from ozone precursors would be fully offset through compliance with SDAPCD Rule 20.3. Therefore, the project would not contribute to increasing regionwide emissions of ozone precursors and would not cause a delay in the progress towards attainment.

ENVIRONMENTAL JUSTICE

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

The air quality analysis for PM_{10} and PM_{10} precursor emissions during routine operations identifies significant impacts that require staff-recommended specifically local mitigation. If the recommended mitigation is not acceptable to the applicant, the PM_{10} impacts could remain partially unmitigated and environmental justice may need to be further evaluated.

COMPLIANCE WITH LORS

FEDERAL

The SDAPCD (District) is responsible for completing the Federal Prevention of Significant Deterioration (PSD) requirements through SDAPCD Rule 20.3. Although the Preliminary Determination of Compliance (PDOC, SDAPCD 2002b) indicates that the Palomar Energy Project would comply with applicable PSD requirements, the U.S. EPA, other agencies, and the public have not yet had opportunity to comment. Without U.S.

EPA involvement, Energy Commission staff cannot make a final recommendation as to whether the project is in compliance with the PSD requirements.

If the Energy Commission grants the project a license including all conditions of the Determination of Compliance, the SDAPCD would then confer the Authority to Construct, which would serve as the PSD permit.

STATE

Staff believes that if the appropriate mitigation is provided to demonstrate compliance with the SDAPCD Rules and Regulations (e.g., requirements for offsets) and Energy Commission recommendations (e.g., additional mitigation for PM_{10}), the project would demonstrate compliance with California State Health and Safety Code, Section 41700.

LOCAL

The SDAPCD issued a Preliminary Determination of Compliance (SDAPCD 2002b) for this project on July 3, 2002, with a 30-day public comment period. The applicant has experienced ongoing delays in obtaining sufficient emission reduction credits and at this time holds only a portion of the credits necessary to comply with District requirements. Because a complete offset package has not been identified at this time, staff believes that the proposed project cannot be found in compliance with the District's Rules and Regulations. Additionally, the District indicated that it is continuing to evaluate the BACT/LAER determination for NOx. The proposed determination for NOx, CO, and ammonia slip may not be consistent with U.S. EPA recommendations, which could identify a need for more stringent control. After U.S. EPA review of the PDOC and the close of the public comment period, the SDAPCD will prepare a Final Determination of Compliance.

Staff cannot determine that the Palomar Energy Project is in compliance with the following requirements of SDAPCD Rule 20.3.

Rule 20.3(d)(1) – Best Available Control Technology/Lowest Achievable Emission Rate

The District is continuing to evaluate the BACT determination for NOx to determine if a limit of 2.0 ppm (one-hour average) without duct burners operating has been demonstrated in practice. The PDOC requires the project to meet 2.0 ppm for VOC, and Energy Commission staff anticipates that further reductions may eventually also be appropriate for CO and ammonia slip. The U.S. EPA is expected to provide comment on the BACT decision of the PDOC.

Rule 20.3(d)(5) – Emission Offsets

The market for emission offsets is extremely competitive in the San Diego region, and the task of creating ERCs depends on the cooperation of third-party source operators and District approval. Creating emission reduction credits and purchasing them is time consuming, and the applicant has experienced delays in the effort to procure adequate credits. Because the applicant is still in the process of obtaining the required NOx-equivalent offsets, staff is concerned that the applicant may not be able to comply with this requirement in a timely manner.

FACILITY CLOSURE

Eventually, the Palomar Energy Project will close, either as a result of the end of its useful life, or through some unexpected situation, such as a natural disaster or catastrophic facility breakdown. When the facility closes all sources of air emissions will cease, and impacts associated with those emissions will no longer occur. The only other expected emissions will be construction/demolition emissions from the dismantling activities. These activities will be short term, nevertheless, staff recommends that a facility closure plan be submitted to the Energy Commission Compliance Project Manager to demonstrate compliance with applicable laws, ordinances, regulations, and standards during closure activities.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

PUBLIC COMMENTS

Mr. Mark Rodriguez, May 2002

Comment: *Mr. Rodriguez registered concerns via emails to staff about whether air quality consequences of diesel trains and traffic railroad crossings have been taken into account. The commenter also notes that there may be city-specific standards that could be stricter than SDAPCD requirements.*

Response: The emissions caused by the project's traffic were reviewed and found to not have substantial air quality effects. Emissions from worker traffic accessing the project would be similar in nature to those caused by other traffic in Escondido, and emissions from railroad activity in the area would not be affected by the project. The applicant estimated traffic emissions in Table 5.2-38 of the Response to Data Adequacy (Palomar 2002a).

The City of Escondido Zoning Code requirements for 'electric generating facilities' (Section 33-1122) is only applicable to those projects within the land-use permitting authority of the City. The other requirements of the Zoning Code are addressed in this CEQA-equivalent analysis. These standards are discussed in section for Laws, Ordinances, Regulations and Standards (LORS).

CONCLUSIONS AND RECOMMENDATIONS

The applicant does not currently have a complete offset package for ozone precursors that satisfies routine SDAPCD permitting requirements or the Energy Commission staff's requirements for CEQA mitigation (see **AIR QUALITY Table 17**). The task of creating emission reduction credits and acquiring them is time consuming and especially competitive in the San Diego region, which leads staff to be concerned that the applicant may not be able to comply with the requirements in a timely manner. Because the offset packages are still incomplete, staff, the U.S. EPA, and the public cannot review or comment on the complete strategy at this time. Therefore, and staff cannot determine whether the Palomar Energy Project is in compliance with the SDAPCD offset rules.

Additionally, the BACT determination of the PDOC appears to be inconsistent with recent U.S. EPA guidance that has identified more stringent NOx and CO levels as being demonstrated in practice while achieving lower levels of ammonia slip. The U.S. EPA is expected to provide comment on the BACT decision of the PDOC. Until U.S. EPA participation occurs, staff cannot determine if the Palomar Energy Project is in compliance with the SDAPCD requirements for BACT.

Based on the information available at this time, significant impacts related to ozone and PM_{10} remain unmitigated. Staff does not have enough information to determine the adequacy of the proposed "mitigation fee" as a viable strategy for reducing PM_{10} impacts. As such, the applicant must provide additional mitigation recommended by staff or develop an appropriate alternative strategy.

Staff cannot recommend certification of the Palomar Energy Project at this time. The applicant needs to resolve outstanding offset and BACT issues at the District level, and the District needs to complete its FDOC. The applicant and staff must develop mitigation measures and conditions of certification to address the significant impacts related to ozone and PM_{10}. Upon resolution of these issues, staff would recommend the following Conditions of Certification to address the impacts and appropriate mitigation for the construction and operation of the Palomar Energy Project.

CONDITIONS OF CERTIFICATION

STAFF CONDITIONS

Staff Construction Conditions

AQ-SC1 The project owner shall submit the resume(s) of each individual proposed to fill the Construction Mitigation Manager (CMM) position to the Compliance Project Manager (CPM) for approval. The project owner shall be responsible for funding the costs of the CMM, however the CMM shall report to the CPM. The CMM shall preferably have a minimum of eight years experience as follows; however the CPM will consider all resumes submitted regardless of experience:

- Five years construction experience, as a subcontractor or general contractor.
- Must have an engineering degree or equivalent or an additional five years construction experience.
- One year construction project management experience.
- Two years air quality assessment experience.
- Certification by the State of California for Visible Emissions Evaluation (U.S. EPA Method 9), or be able to obtain certification prior to the initiation of construction activities.

Protocol: The project owner shall make available a dedicated office for the CMM. The CMM shall be responsible for implementing all mitigation measures related to construction equipment combustion emissions, construction monitoring, and enforcing the effectiveness of construction mitigation measures as outlined in Conditions of Certification **AQ-SC3** and **AQ-SC4**. A CMM shall be onsite or available to be onsite at any time, until deemed no longer necessary by the CPM. The CMM shall be granted access to all areas of the main and related linear facility construction sites. The CMM shall have the authority to stop construction on either the main power plant or the related linear facility construction sites as specified in Condition of Certification **AQ-SC3** (Step #3) below. The CMM may not be terminated prior to the cessation of all construction activities unless approval is granted by the CPM.

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

AQ-SC2 The project owner shall ensure that the CMM submits directly to the CPM, via the Monthly Compliance Report (MCR), a report of all compliance actions taken germane to Conditions of Certification **AQ-SC3** and **AQ-SC4**. The documentation shall include, at a minimum, the following elements:

Fugitive Dust Mitigation Monthly Report
(see Condition of Certification AQ-SC3)

- A summary of each of the operation(s) planned for the following two months which may result in the generation of fugitive dust. Each description shall include a schedule, on-site location details and a list of proposed fugitive dust mitigation measures.
- A summary of all mitigation activities implemented for each fugitive dust generating operation identified in a previous report. This report should provide a summary description of the operation, the mitigation measures implemented and the estimated effectiveness of each mitigation measure.
- Details of all operation(s) requiring fugitive dust mitigation that are not identified in the previous report or the FDMP. Details shall include (at a minimum) a description of the operation, the date, duration, mitigation measures implemented, and an explanation for not reporting the operation in a previous report (or in the FDMP).
- Identification of any failures of mitigation measures and details of the actions taken to reduce the identified impacts and prevent future failures of those mitigation measures.
- Identification of any observation by the CMM of dust plumes beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) where taken to abate the plume.

Diesel Construction Equipment Mitigation Monthly Report (see Condition of Certification AQ-SC4)

- Identification of any changes, as approved by the CPM, to the Diesel Construction Equipment Mitigation Plan from the initial report or the last monthly report including any new contractors and their diesel construction equipment.
- Copies of all receipts or other documentation indicating type and amount of fuel purchased, from whom, where delivered and on what date for the main and related linear construction sites.
- Identification and verification of all diesel engines required to meet U.S. EPA or CARB 1996 off-road diesel equipment emission standards.
- The suitability of the use of a catalyzed diesel particulate filter for a specific piece of construction equipment is to be determined by a qualified mechanic or engineer who must submit a report through the CMM to the CPM for approval. The identification of any suitability report being initiated, pursued or the completed report should be included the monthly report (in the month that it was completed) as should the verification of any subsequent installation of a catalyzed diesel particulate filter.
- Identification of any observation by the CMM of dark plumes emanating from diesel-fired construction equipment beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) were taken to abate the plume or future expected plumes.

Verification: The project owner shall ensure that the CMM submits directly to the CPM for approval (and a copy to the project owner), a monthly report of all compliance actions taken germane to Conditions of Certification **AQ-SC3** and **AQ-SC4**. The report is due within ten working days after the end of each reporting month.

AQ-SC3 The project owner shall ensure that the CMM prepares and submits for approval to the CPM, a Fugitive Dust Mitigation Plan (FDMP) that specifically identifies all fugitive dust mitigation measures that will be employed for the construction of the facility. The project owner shall ensure that the FDMP will be administered on site by the full time CMM.

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

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

- Sandbags to prevent run off;
- Posted speed limit signs;
- Wheel washing areas prior to large trucks leaving the project site;
- Methods that will be used to clean tracked-out mud and dirt from the project site onto public roads;
- For any transportation of borrowed fill material,
    1. Vehicle covers;
    2. Wetting of the transported material;
    3. Appropriate freeboard;
- Methods for the stabilization of storage piles and disturbed areas;
- Windbreaks at appropriate locations;
- Suspension of all earth moving activities under windy conditions (sustained winds above 25 mph); and,
- On-site monitoring devices.

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

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

b) Visual observations of all construction activities.

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

1. The CMM shall direct more aggressive application of the existing mitigation methods within 15 minutes of making such a determination.
2. The CMM shall direct implementation of additional methods of dust suppression if step #1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.
3. The CMM shall direct a temporary shutdown of the source of the emissions if step #2 specified above fails to result in adequate mitigation within one hour of the original determination. The activity shall not restart until one full hour after the shutdown. The project owner may appeal to the CPM any directive from the CMM to shutdown a source, provided that the shutdown shall go into effect within one hour of the original determination unless overruled by the CPM before that time.

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

AQ-SC4 The project owner shall ensure that the CMM prepares and submits to the CPM for approval a Diesel Construction Equipment Mitigation Plan (DCEMP) that will specifically identify diesel engine mitigation measures that will be employed during the construction phase of the main and related linear construction sites. The project owner shall ensure that the CMM will be responsible for directing implementing of and compliance with all measures identified in the DCEMP. The DCEMP shall address, at a minimum, the following mitigation measures:

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

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

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

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

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

3. If the construction equipment is intended to be on-site for ten days or less, then none of the mitigation measures identified in item #2 of this condition are required.

4. The CPM may grant relief from the mitigation measures listed under item #2 of this condition for a specific piece of equipment if the CMM can demonstrate that the project owner has made a good faith effort to comply with the mitigation measures and that compliance is not possible.

5. Any implemented mitigation measure in item #2 of this condition may be terminated immediately if the CMM determines one of the following conditions exists; however the CPM must be informed within ten working days of the termination:

   5.1 The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or reduced power output due to an excessive increase in back pressure.

   5.2 The measure is causing or is reasonably expected to cause significant engine damage.

   5.3 The measure is causing or is reasonably expected to cause a significant risk to workers or the public.

   5.4 Any other seriously detrimental cause which has approval by the CPM prior to the termination being implemented.

6. All contractors must agree to limit diesel engine idle time on all diesel-powered equipment to no more than ten (10) minutes, to the extent practical.

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

AQ-SC5 The project owner shall discourage intensive heavy equipment operation during grading and excavation of the power plant site (PA1) by specifying in construction contracts that this phase of work should occur over a duration of at least six months.

Verification: At least 30 days prior to site mobilization, the project owner shall provide the CPM with a copy of a site construction schedule and the associated construction contractor agreement.

Staff Operating Conditions

AQ-SC6 The project owner shall submit to the CPM for review and approval any modification proposed by either the project owner or issuing agency to any project air permit.

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

AQ-SC7 The project owner shall submit to the CPM and District APCO Quarterly Compliance Reports, no later than 30 days following the end of each calendar quarter, that include operational and emissions information as necessary to demonstrate compliance with Conditions **AQ-SC8**, **AQ-SC9**, and **AQ-1** through **AQ-55**, as applicable. The Quarterly Operation Report will specifically note or highlight instances of noncompliance and the corrective measures taken to correct these incidents.

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

AQ-SC8 The project owner shall provide a flow meter to determine the daily cooling tower circulating water flow and shall monitor and record the daily flow.

Verification: The project owner shall submit to the CPM the daily cooling tower recirculating water flow data in the Quarterly Operation Reports (**AQ-SC7**).

AQ-SC9 The cooling tower annual PM_{10} emissions shall be limited to 5.7 ton/year. The project owner shall estimate annual PM_{10} emissions from the cooling tower using the water quality testing data and recirculating water flow data collected on a quarterly basis (**AQ-SC8** and **AQ-35**).

Verification: The project owner shall submit to the CPM annual cooling tower PM_{10} emission estimates in the Quarterly Operational Reports (**AQ-SC7**).

DISTRICT PRELIMINARY DETERMINATION OF COMPLIANCE CONDITIONS

General Conditions

AQ-1 The project owner shall operate the project in accordance with all data and specifications submitted with the application under which this license is issued unless otherwise noted below.

Verification: The project owner shall either certify compliance with this condition or provide documentation regarding the upsets or operation compliance violations that occurred as part of the Quarterly Operational Report (**AQ-SC7**). The

project owner shall make the site available for inspection by representatives of the District, CARB and the Energy Commission.

AQ-2 The project equipment shall be properly maintained and kept in good operating condition at all times.

Verification: The project owner shall certify that the equipment has been maintained and kept in good operating as part of the Quarterly Operational Report (**AQ-SC7**). The project owner shall make the site available for inspection by representatives of the District, CARB, and the Energy Commission.

AQ-3 The project owner shall provide access, facilities, utilities, and any necessary safety equipment for source testing and inspection upon request of the Air Pollution Control District.

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB, and the Energy Commission. The project owner shall provide access, facilities, utilities and necessary safety equipment for source testing available upon request to representatives of the District.

AQ-4 The project owner shall obtain any necessary District permits for all ancillary combustion equipment including emergency engines, prior to on-site delivery of the equipment.

Verification: The project owner shall submit to the District and the CPM any necessary permit applications for ancillary combustion equipment prior to the on-site delivery of the equipment. **[Note: Energy Commission siting regulations may require the project owner to obtain an amendment for such project changes.]**

AQ-5 The exhaust stacks for each turbine power station shall be at least 110 feet in height above site base elevation.

Verification: The project owner shall make the site available for inspection of the exhaust stacks by representatives of the District, CARB, and the

AQ-6 The project owner shall submit to the District the final selection, design parameters and details of the selective catalytic reduction (SCR) and oxidation catalyst emission control systems. Such information may be submitted to the District as trade secret and confidential pursuant to District Rules 175 and 176.

Verification: The project owner shall submit SCR and oxidation catalyst design details to the District and the CPM at least 90 days prior to commencement of construction.

AQ-7 The exhaust stacks for each turbine shall be equipped with source test ports and platforms to allow for the measurement and collection of stack gas samples consistent with all approved test protocols. The ports and platforms

shall be constructed in accordance with District Method 3A, Figure 2, and approved by the District.

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

AQ-8 This equipment shall be fired on natural gas only. The sulfur content of the natural gas used shall not exceed 0.75 grains per 100 standard cubic feet of natural gas. The project owner shall maintain quarterly records of fuel content (grains of sulfur compounds per 100 scf of natural gas) and higher heating value (BTU/scf) and shall make these records available to District personnel upon request. Specifications, including sulfur content and higher heating value, of all natural gas, other than Public Utility Commission-regulated natural gas, shall be submitted to the District for written approval prior to use.

Verification: The project owner shall compile continuous fuel sulfur content and higher heating value monitoring data from the gas supplier, or if such data is not available, the project owner shall test the sulfur content and higher heating value of the natural gas fuel monthly using recognized ASTM method(s). The fuel sulfur content data shall be submitted to the CPM in the Quarterly Operational Report (**AQ-SC7**).

AQ-9 A Continuous Emission Monitoring System (CEMS) shall be installed and calibrated to measure and record the concentration of NOx and CO in the exhaust gas on a dry basis (ppmvd) corrected to 15 percent oxygen and lb/hr and lb/MM BTU, and oxygen (O_2) in the exhaust gas. Upon initial firing and prior to final approval of the permanent CEMS, a portable CEMS, which has been properly calibrated, shall be used to continuously measure and record these conditions. The portable CEMS shall remain in full operation at all times when the turbine is in operation until the permanent CEMS has been properly installed and certified. The permanent CEMS shall thereafter be in full operation at all times when the turbines are in operation.

Verification: The project owner shall provide the information necessary for compliance with this condition in the permanent CEMS protocol required under Condition **AQ-13**.

AQ-10 At least 60 days prior to initial firing of the gas turbines, the project owner shall submit a protocol to the District, for written approval, that shows how the permanent CEMS will be able to meet all District monitoring requirements and measure NOx emissions at a level of 2.0 ppmv.

Verification: The project owner shall provide the information necessary for compliance with this condition in the permanent CEMS protocol required under Condition **AQ-13**.

AQ-11 The project owner shall submit a protocol to the District for approval which shall specify a method of determining the CO/VOC surrogate relationship that shall be used to demonstrate compliance with all VOC emission limits.

Verification: The project owner shall submit the CO/VOC surrogate determination protocol to the CPM and District at least 60 days prior to initial firing of the turbine. This protocol can be provided as part of the Source Testing Protocol required by condition **AQ-43**.

AQ-12 Prior to initial firing, each turbine shall be equipped with continuous monitors to measure or calculate and record the following operational characteristics of each unit:

- natural gas flow rate (scfh);
- heat input rate (MMBtu /hr);
- exhaust gas flow rate (dscfm);
- exhaust gas temperature (ºF); and
- power output (gross MW).

Protocol: The monitors shall be installed, calibrated, and maintained in accordance with an approved protocol. This protocol, which shall include calculation methodology, shall be submitted to the District for written approval. The monitors shall be in full operation at all times when the turbine is in operation.

Verification: At least 60 days prior to the initial firing of the gas turbines, the project owner shall submit a turbine operation monitoring protocol to the District for written approval. The project owner shall provide the CPM documentation of the District's written approval of this protocol, within 15 days of its receipt. The project owner shall make the site available for inspection of the turbine operation monitors and monitor maintenance records by representatives of the District, CARB, and the Energy Commission.

AQ-13 All CEMS shall be certified, calibrated, maintained, and operated for the monitoring of NOx and CO in accordance with the applicable regulations including the requirements of Sections 75.10 and 75.12 of Title 40, Code of Federal Regulations Part 75 (40 CFR 75), the performance specifications of Appendix A of 40 CFR 75, the quality assurance procedures of Appendix B of CFR 75, and a CEMS protocol approved by the District. The project owner shall submit a CEMS operating protocol to the District for written approval.

Verification: At least 60 days prior to the operation of the permanent CEMS, the project owner shall submit a CEMS operating protocol to the District for written approval. The project owner shall provide the CPM documentation of the District's written approval of the CEMS operating protocol, within 15 days of its receipt. The project owner shall make the site available for inspection of the CEMS and CEMS maintenance records by representatives of the District, CARB, and the Energy Commission.

AQ-14 The District shall be notified in writing prior to any proposed changes to be made in any Continuous Emission Monitor (CEM) software which affect the value of data displayed on the CEM monitors and recorded for reporting with respect to the parameters measured by their respective sensing devices.

Verification: The project owner shall provide the District and the CPM copies of any proposed CEMS software change correspondence at least two weeks prior to any proposed changes.

AQ-15 A monitoring plan in conformance with 40 CFR 75.53 shall be submitted to U.S. EPA Region 9 and the District at least 45 days prior to the Relative Accuracy Test Audit test, as required in 40 CFR 75.62.

Verification: The project owner shall notify the CPM of the submittal of the monitoring plan required under this condition within 15 days of its submittal to the District. The project owner shall provide the CPM documentation of the District approval of the monitoring plan required under this condition within 15 days of its receipt.

AQ-16 No later than 90 days after each unit commences commercial operation, a Relative Accuracy Test Audit (RATA) and other required certification tests shall be performed and completed on the CEMS in accordance with 40 CFR Part 75 Appendix A Specifications and Test Procedures. At least 60 days prior to the test date, the project owner shall submit a test protocol to the District for written approval. Additionally, the District shall be notified a minimum of 45 days prior to the test so that observers may be present. Within 30 days of completion of this test, a written test report shall be submitted to the District for approval.

Verification: The project owner shall notify the CPM of the submittal of the RATA test protocol and the RATA test report within 15 days of its submittal to the District. The project owner shall notify the CPM and the District of the RATA test date at least 45 days prior to the conducting the RATA test. The project owner shall provide the CPM documentation of the District approval of the RATA test protocol and RATA test report within 15 days of its receipt.

AQ-17 The total aggregate 12-month emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, from all emission units at this stationary source shall not exceed 124.4 tons for each consecutive 12-calendar month period. The NOx emissions shall begin accruing at the initial firing of each turbine. Compliance with these limits shall be verified using the CEMS on each gas turbine as well as U.S. EPA- or ARB-certified NOx emission factors, testing results, or other representative emissions information for all other combustion equipment.

Verification: The project owner shall submit to the CPM and the District turbine emissions CEMS data and calculations demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-18 The total aggregate 12-month emissions of Volatile Organic Compounds (VOC) from all emission units at this stationary source shall not exceed 50 tons for each consecutive 12-calendar month period. The VOC emissions shall begin accruing at the initial firing of each turbine. Compliance with this limit shall be based on District-approved source testing and the District-approved CO/VOC surrogate relationship.

Verification: The project owner shall submit to the CPM and the District turbine emissions CEMS data and calculations demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-19 The project owner shall maintain records, at least on a calendar monthly basis, of total aggregate mass emissions of NOx and VOC, in tons per rolling 12-calendar month period, from all equipment, excluding permit exempt equipment, at this stationary source for the previous 12-month period. These records shall be maintained on site for a minimum of five years and made available to the District upon request.

Verification: The project owner shall make the site available for inspection of the NO_x and VOC emissions records by representatives of the District, CARB, and the Energy Commission.

AQ-20 To ensure compliance with District Rule 69.3.1 and except during any period of time for which a variance from Rule 69.3.1 has been granted by the Air Pollution Control District Hearing Board, when operating with post-combustion air pollution control equipment, emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, from each turbine shall not exceed 11.8 parts per million by volume on a dry basis (ppmvd) calculated over each one-hour averaging period and corrected to 15 percent oxygen, excluding shutdowns, and extended and regular startups.

Verification: The project owner shall submit to the CPM and the District turbine CEMS emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-21 During shutdowns, and extended and regular startups, when operating with post-combustion air pollution control equipment, the total emissions from both turbines combined shall not exceed 200 pounds per hour of oxides of nitrogen (NOx), calculated as nitrogen dioxide and measured over each clock hour period. Additionally, when operating with post-combustion air pollution control equipment, the total emissions when only one turbine is in operation shall not exceed 100 pounds per hour of NOx, calculated as nitrogen dioxide and measured over each clock hour period. (To comply with District Rule 20.3 (d)(2)(i)).

Verification: The project owner shall submit to the CPM and the District turbine CEMS startup and shutdown emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-22 During extended startup and shutdown, when operating with post-combustion air pollution control equipment, the total emissions from both turbines combined shall not exceed 3,384 pounds per hour of carbon monoxide (CO), averaged over a one-hour averaging period. Additionally, when operating with post-combustion air pollution control equipment, the total emissions when one turbine is in operation shall not exceed 1,692 pounds per hour of CO over a one-hour averaging period. (To comply with District Rule 20.3 (d)(2)(i)).

Verification: The project owner shall submit to the CPM and the District turbine CEMS startup and shutdown emissions data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

Commissioning Period Conditions

AQ-23 Beginning at initial firing of each turbine, a "Commissioning Period" for each turbine shall commence. This Commissioning Period shall end 120 days after initial firing or immediately after written acceptance of clear custody and control of the equipment is turned over to the project owner, whichever comes first and shall conclude with less than 300 hours of gas turbine operation. During the Commissioning Period, only the emission limits specified in Conditions Nos. **AQ-17, 18, 19, 20, 21, 24, 25, 26** and **27** shall apply.

Verification: The project owner shall submit to the CPM and the District turbine operating data demonstrating compliance with this condition as part of the Commissioning Status Report (**AQ-28**).

AQ-24 During the Commissioning Period when operating without any post-combustion air pollution control equipment, the total emissions from both turbines combined shall not exceed 900 pounds per hour of oxides of nitrogen (NOx), calculated as nitrogen dioxide and measured over each clock hour period. Additionally, when operating without any post-combustion air pollution control equipment, the total emissions when only one turbine is in operation shall not exceed 450 pounds per hour of NOx, calculated as nitrogen dioxide and measured over each clock hour period. These emission limits shall apply during commissioning, shutdowns, and extended and regular startups to comply with District Rule 20.3(d)(2)(i).

Verification: The project owner shall submit to the CPM and the District turbine CEMS emissions data demonstrating compliance with this condition as part of the Commissioning Status Report (**AQ-28**).

AQ-25 Within 120 days or 200 hours of gas turbine operation, whichever comes first, after initial firing of each turbine, the project owner shall install post-combustion air pollution control equipment to minimize emissions from this equipment. Once installed, the post-combustion air pollution control equipment shall be maintained in good condition and, with the exception of periods during startup and shutdown, shall be in full operation at all times when the turbine is in stable operation.

Verification: The project owner shall provide the CPM and the District operating data showing compliance with this condition as part of the Commissioning Status Report (**AQ-28**). The project owner shall make the site available for inspection of the post-combustion air pollution control equipment and the CEMS records by representatives of the District, CARB, and the Energy Commission.

AQ-26 During the Commissioning Period when operating without any post-combustion air pollution control equipment, the total emissions from both turbines combined shall not exceed 4,000 pounds per hour of carbon monoxide (CO), measured over each clock hour period. Additionally, when operating without any post-combustion air pollution control equipment, the total emissions when one turbine is in operation shall not exceed 2,000 pounds per hour of CO measured over each clock hour period. (To comply with District Rule 20.3 (d)(2)(i)).

Verification: The project owner shall submit to the CPM and the District turbine CEMS emissions data demonstrating compliance with this condition as part of the Commissioning Status Report (**AQ-28**).

AQ-27 To ensure compliance with District Rule 69.3.1 and except during any period of time for which a variance from Rule 69.3.1 has been granted by the Air Pollution District Hearing Board, when operating without any post combustion air pollution control equipment, the emissions of oxides of nitrogen (NOx), calculated as nitrogen dioxide, from each turbine shall not exceed 19.6 parts per million by volume on a dry basis (ppmvd) calculated over each one-hour averaging period and corrected to 15 percent oxygen, excluding shutdowns, regular and extended startups.

Verification: The project owner shall submit to the CPM and the District turbine CEMS emissions data demonstrating compliance with this condition as part of the Commissioning Status Report (**AQ-28**).

AQ-28 After the end of the Commissioning Period for each turbine, the project owner shall submit a written progress report to the District. This report shall include, at minimum, the date the Commissioning period ended, the periods of startup, the emission of NOx and CO during startup, and the emissions of NOx and CO during steady state operation with and without duct burner firing. NOx and CO emissions shall be reported in both ppmv at 15 percent O_2 and lbs/hr. This report shall also detail any turbine or emission control equipment malfunction, upset, repairs, maintenance, modifications, or replacements affecting emissions of air contaminants that occurred during the Commissioning Period.

Verification: The project owner shall submit to the District and the CPM, within 30 days after the end of the Commissioning Period for each turbine, a Commissioning Status Report that demonstrates compliance with this condition and the emissions limits and other requirements of Conditions **AQ-23** through **AQ-27** and **AQ-29**.

AQ-29 Before operating an SCR system, continuous monitors shall be installed on each SCR system to monitor or calculate, and record the following:

- ammonia injection rate (lbs/hr)
- SCR catalyst temperature (ºF)

Protocol: The monitors shall be installed, calibrated, and maintained in accordance with an approved protocol. This protocol, which shall include the calculation methodology, shall be submitted to the District for written approval at least 60 days prior to initial firing of the gas turbines with the SCR system. The monitors shall be in full operation at all times when the turbine is in operation.

Verification: The project owner shall submit the proposed protocol for the SCR system continuous monitors, at least 60 days prior to initial firing of the gas turbines with the SCR system, to the District and CPM for approval. The project owner shall make the site available for inspection of the SCR system continuous monitors and monitoring records by representatives of the District, CARB, and the Energy Commission.

Conditions for On-Going Operations

AQ-30 For the purpose of the Determination of Compliance and Authority to Construct, the period described as "on-going" operations of the turbines shall commence immediately following the end of the Commissioning Period. Condition Nos. **AQ-17, 18, 19, 20, 21, 24, 26,** and **27** shall continue to apply during on-going operations.

Verification: The project owner shall certify that compliance with the conditions for "on-going" operations commenced immediately following the end of the Commissioning Period with the first Quarterly Operational Report (**AQ-SC7**) following the Commissioning Status Report (**AQ-28**).

AQ-31 The emissions of oxides of nitrogen (NOx) from each gas turbine when operated with or without duct burners, calculated as nitrogen dioxide, shall not exceed 2.0 parts per million by volume (3 hr rolling average) on a dry basis (ppmvd) corrected to 15 percent oxygen. Compliance with this limit shall be based on CEMS data for each unit averaged over each rolling 3-hour period, or portions thereof, as applicable, excluding time when the equipment is operated under startup or shutdown conditions and time that the equipment is not in operation. Compliance with this limit shall also be verified through an initial source test and at least annual source testing thereafter.

(Note: The District is continuing to evaluate whether a NOx emission limit of 2 ppm, one-hour average, without duct burners operating, has been demonstrated at a similar plant on the East Coast and may revise this condition in the FDOC.)

Verification: The project owner shall submit to the District and the CPM turbine initial source test data, CEMS emissions data, and annual source test data

demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-32 The emissions of carbon monoxide (CO) from each turbine shall not exceed 4.0 parts per million by volume (3-hr rolling average) on a dry basis (ppmvd) corrected to 15 percent oxygen. Compliance with these limits shall be based on CEMS data for each unit and averaged over each rolling 3-hour period or portion there of, excluding time when the equipment is operated under startup or shutdown conditions and time that the equipment is not in operation. Compliance with this limit shall also be verified through an initial emission source test and at least annual source testing thereafter.

Verification: The project owner shall submit to the District and the CPM turbine initial source test data, CEMS emissions data, and annual source test data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-33 The emissions of volatile organic compounds (VOC) from each turbine, calculated as methane, shall not exceed 2.0 parts per million by volume (3-hr average) on a dry basis (ppmvd) corrected to 15 percent oxygen. Compliance with this limit shall be based on District-approved source testing, the District-approved CO/VOC surrogate relationship, and on CO CEMS data for each unit, averaged over each rolling 3-hour period or portion thereof, when using CO CEMS data, excluding time when the equipment is operated under startup or shutdown conditions and time the equipment is not in operation. The CO/VOC surrogate relationship shall be verified and/or modified, if necessary, based on initial emissions source tests and at least annual source testing thereafter.

Verification: The project owner shall submit to the District and the CPM turbine initial source test data, CEMS emissions data, annual source test data, and calculations demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-34 The emissions of ammonia (ammonia slip) from each gas turbine exhaust stack following the SCR controls shall not exceed 10.0 parts per million by volume on a dry basis (ppmvd) corrected to 15 percent oxygen. Compliance with this limit shall be verified through an initial source test and at least annual source testing thereafter.

Verification: The project owner shall submit to the District and the CPM turbine initial source test data and annual source test data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-35 The maximum total dissolved solids (TDS) concentration of the reclaimed water to be used in the cooling towers shall not exceed 4,000 mg/l. This concentration shall be verified through quarterly testing of the reclaimed water.

Verification: The project owner shall submit to the District and the CPM the quarterly cooling tower total dissolved solids test results demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-36 When operating without the duct burner, the emissions from each turbine shall not exceed the following emission limits, except during startup or shutdown conditions, as determined by the CEMS and/or District approved emissions source testing. Compliance with the NOx limit shall be based on each rolling *one-hour* averaging period or portion thereof, and compliance with CO and VOC limits shall be based on each rolling 3-hour averaging period or portion thereof.

Pollutant	Emission Limit, lbs/hr
Oxides of Nitrogen, NOx (calculated as NO_2)	12.5
Carbon Monoxide, CO	15.3
Volatile Organic Compounds, VOC	3.8

Verification: The project owner shall submit to the District and the CPM turbine CEMS emissions data and calculations demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-37 When operating with the duct burner, the emissions from each turbine shall not exceed the following emission limits, except during startup or shutdown conditions, as determined by the Continuous Emissions Monitoring System (CEMS) and continuous monitors and / or District approved emissions source testing. Compliance with the NOx, CO, and VOC limits shall be based on rolling 3-hour averaging period.

Pollutant	Emission Limit, lbs/hr
Oxides of Nitrogen, NOx (calculated as NO_2)	14.9
Carbon Monoxide, CO	18.1
Volatile Organic Compounds, VOC	7.3

Verification: The project owner shall submit to the District and the CPM turbine CEMS emissions data and calculations demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-38 This maximum fuel input into the duct burners in the plant shall not exceed 780,000 MMBtu per rolling 12-calendar month period. The project owner shall maintain a log that contains, at a minimum, the dates, times, and duct burner fuel consumption when one or both turbines are operated with the duct burners in operation. These logs shall be maintained on site for a minimum of five years and made available to District personnel upon request.

Verification: The project owner shall submit to the District and the CPM duct burner fuel consumption data demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-39 Extended startup shall be defined as the time necessary to reach minimum operating conditions for the air pollution control equipment and to meet the emission limits specified in Conditions **AQ-31** and **AQ-32**, not to exceed four hours, after initial firing of the turbine following a shutdown period of greater than or equal to 48 hours.

Verification: The project owner shall submit to the District and the CPM extended startup frequency and duration data as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-40 A regular startup shall be defined as the time necessary to reach minimum operating conditions for the air pollution control equipment and to meet the emission limits specified in Conditions **AQ-31** and **AQ-32**, not to exceed two hours in duration, after initial firing of the turbine following a shutdown period of less than 48 hours.

Verification: The project owner shall submit to the District and the CPM startup frequency and duration data as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-41 Shutdown is defined as the period beginning with the lowering of the output of a gas turbine below 50 percent of its base capacity and below the minimum operating conditions for the air pollution control equipment, and ending when combustion has ceased.

Verification: The project owner shall submit to the District and the CPM shutdown frequency and duration data as part of the Quarterly Operational Report (**AQ-SC7**).

AQ-42 The emissions of particulate matter less than 10 microns (PM_{10}) shall not exceed 14.0 lbs/hr for each turbine. Compliance with this limit shall be based on an initial emissions source test and at least annual source testing thereafter.

Verification: The project owner shall provide to the District and the CPM the PM_{10} source test results, as required by **AQ-43** and **AQ-45**, to demonstrate compliance with this condition.

AQ-43 Within 30 days after completion of the Commissioning Period, an initial emissions source test shall be conducted by an independent, ARB approved tester at the project owner's expense to show compliance with all applicable emission limits. A source test protocol shall be submitted to the District for written approval at least 60 days prior to source testing. The source test protocol shall comply with the following requirements:

a. Measurement of oxides of nitrogen (NOx), carbon monoxide (CO), and stack gas oxygen shall be conducted in accordance with the San Diego Air Pollution Control District Method 100, or equivalent, as approved by the U.S. EPA.

b. Measurements of particulate matter less than 10 microns shall be conducted in accordance with the U.S. Environmental Protection Agency (U.S. EPA) Methods 201A and 202.

c. Measurements of volatile organic compounds (VOC) shall be conducted in accordance with San Diego Air Pollution Control District Methods 25A and /or 18 and ammonia in accordance with BAAQMD ST-1B.

d. Source testing shall be performed without duct burner firing at no less than 80 percent of the turbine base load operation, and with duct burner firing at no less than 80 percent of combined capacity.

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

AQ-44 Within 30 days after completion of the Commissioning Period, an initial emissions source test shall be conducted by an independent, ARB approved tester at the project owner's expense to determine the emissions of toxic air contaminants (TAC). A source test protocol shall be submitted to the District for written approval at least 60 days prior to source testing. The source test shall demonstrate compliance with District Rule 1200 requirements for the gas turbines and duct burners. The source test is limited to the gas turbines only and will not include testing of the cooling towers. At a minimum the following compounds shall be tested for and emissions, if any, quantified:

- Acetaldehyde
- Acrolein
- Benzene
- Formaldehyde
- Toluene
- Xylenes

Protocol: This list of compounds may be adjusted by the District based on source test results to ensure compliance with District Rule 1200 is demonstrated. The District may require one or more or additional compounds to be quantified through source testing periodically as needed to ensure compliance with Rule 1200.

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

AQ-45 A final source test report shall be submitted to the District and the CPM for review and approval. The testing contractor shall include, as part of the test

report, a certification that to the best of its knowledge the report is a true and accurate representation of the test conducted and the results.

Verification: The project owner shall submit certified initial source test results no later than 60 days following the initial source test date to both the District and CPM for approval.

AQ-46 The final test report for the initial source tests shall also include a method for establishing a VOC/ TAC surrogate relationship. This relationship, in conjunction with the CO/VOC surrogate relationship, shall be used to show continued compliance with toxic air contaminant emission levels to demonstrate compliance with Rule 1200.

Verification: The project owner shall provide in the certified initial source test report (as required by Condition **AQ-45**) a method for establishing VOC/TAC and CO/VOC surrogate relationships for approval by the District and the CPM.

AQ-47 This equipment shall be source tested on at least an annual basis to show continued compliance with all applicable emissions limits, unless otherwise directed in writing by the District. An annual CEMS RATA, where required, may be used to fulfill the annual source testing requirement for NOx and CO. If the testing will be performed by someone other than the District, a source test protocol shall be submitted to the District for written approval at least 60 days prior to source testing. The source test protocol shall comply with the same requirements as listed in Condition **AQ-43**. Within 60 days after completion of testing, a final test report shall be submitted to the District for review and approval.

Verification: The project owner shall, if the annual compliance source test is not conducted by the District, submit certified annual compliance source test and/or CEMS RATA results no later than 60 days following the annual source test and/or CEMS RATA date to both the District and CPM for approval. If the source test is conducted by the District the project owner shall provide a copy of the source test results to the CPM for review within 15 days of their receipt from the District.

AQ-48 The emissions of any single federal hazardous air pollutant shall not equal or exceed 10 tons, and the aggregate emissions of all federal hazardous air pollutants, shall not equal or exceed 25 tons in any rolling 12-calendar month period. If emissions exceed these limits, the project owner shall apply to amend these limits and conduct a Maximum Achievable Control Technology (MACT) analysis in accordance with applicable federal U.S. EPA regulations. Compliance with this limit shall be based on District approved VOC/TAC and CO/VOC surrogate relationships and the result of District approved source testing.

Verification: The project owner shall provide hazardous air pollutant emissions calculations using the District/CPM approved CO/VOC and VOC/TAC surrogate relationships demonstrating compliance with this condition as part of the Quarterly Operational Report (**AQ-SC7**). If emissions exceed the limits specified in this

condition the project owner shall apply to amend these limits and conduct a Maximum Achievable Control Technology (MACT) analysis in accordance with applicable federal U.S. EPA regulations.

AQ-49 Prior to the initial firing of this equipment, the project owner shall surrender to the District Class A Emission Reduction Credits (ERCs) in an amount equivalent to 148.8 tons per year of NOx to offset the maximum potential to emit NOx emissions from this facility.

Verification: The project owner shall surrender the required ERCs to the District and provide copies of all related correspondence to the CPM within 15 days of its submittal.

Additional General Conditions

AQ-50 For each emission limit expressed as pounds per hour or parts per million based on a *one-hour* averaging period, compliance shall be based on each rolling continuous *one-hour* period using data collected at least once every 15 minutes when compliance is based on continuous emissions data.

Verification: The project owner shall verify that the emission data provided in the Quarterly Operational Report (**AQ-SC7**) is calculated as specified above and the project owner shall make the CEMS emission data available for inspection by representatives of the District, CARB, and the Energy Commission upon request.

AQ-51 For each emission limit expressed as pound per hour or parts per million based on a 3-hour averaging period, compliance shall be based on each rolling continuous 3-hour period using data collected at least once every 15 minutes when compliance is based on continuous emissions monitoring data.

Verification: The project owner shall verify that the emission data provided in the Quarterly Operational Report (**AQ-SC7**) is calculated as specified above and the project owner shall make the CEMS emission data available for inspection by representatives of the District, CARB, and the Energy Commission upon request.

AQ-52 All records required by Conditions **AQ-1** through **AQ-55** shall be maintained on site for a minimum of five years and made available to the District upon request.

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

AQ-53 Pursuant to 40 CFR 72.30(b)(2)(ii) of the Federal Acid Rain Program, the project owner shall submit an application for a Title IV Operating Permit at least 24 months prior to the initial startup of this equipment.

Verification: The project owner shall provide copies of the Title IV Operating Permit application to the District and the CPM at least 24 months prior to the initial startup of the turbines.

AQ-54 The project owner shall comply with the continuous emission monitoring requirements of 40 CFR Part 75.

Verification: The project owner shall provide the District and the CPM with the information necessary to demonstrate compliance with this condition in the permanent CEMS protocol (**AQ-13**) and as part of the Quarterly Operational Reports (**AQ-SC7**).

AQ-55 The project owner shall submit an application to the District for a Federal (Title V) Operating Permit, in accordance with District Regulation XIV within 12 months after initial startup of this equipment.

Verification: The project owner shall provide copies of the Title V Operating Permit application to the District and the CPM within 12 months after initial startup of the turbines.

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BIOLOGICAL RESOURCES

Bruce Barnett and Rick York

INTRODUCTION

This section provides the Energy Commission staff's preliminary assessment of potential impacts to biological resources from the construction and operation of the Palomar Energy Project (PEP). This analysis addresses potential impacts to state and federally listed species, species of special concern, wetlands, and other areas of critical biological concern. This analysis also describes the biological resources of the project site and at the locations of associated facilities. It also determines the need for mitigation, the adequacy of mitigation proposed by the applicant, and where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also evaluates the applicant's compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in Palomar's Application For Certification (Palomar 2001a); Palomar's February 5, April 8, and May 8, 2002 Data Responses (Palomar 2002a, b, c); and discussions with the United States Fish and Wildlife Service (USFWS 2002) and the California Department of Fish and Game (CDFG 2002).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

Endangered Species Act of 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq. designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

Fish and Game Coordination Act

Title 16, United States Code, section 661 et seq. requires federal agencies to coordinate federal actions with the U. S. Fish and Wildlife Service (USFWS) to conserve fish and wildlife resources.

Clean Water Act of 1977

Title 33, United States Code, section 1344 and Title 30 Code of Federal Regulations, section 330.5(a)(26) regulate the placement of fill in waters of the United States and adjacent wetlands.

Migratory Bird Treaty Act

Title 16, United States Code, sections 703 through 712 prohibit the take of migratory birds.

STATE

California Endangered Species Act of 1984

Fish and Game Code, section 2050 et seq. protect California's rare, threatened, and endangered species.

Nest or Eggs – Take, Possess, or Destroy

Fish and Game Code, section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

Birds of Prey or Eggs – Take, Possess, or Destroy

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

Migratory Birds – Take or Possession

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

Fully Protected Species

Fish and Game Code, section 3511, sections 4700, 5050, and 5515 prohibit take of animals that are classified as Fully Protected in California.

Natural Community Conservation Plan (NCCP) Act of 1991

This act includes provisions for protection and management of state-listed threatened or endangered plants and animals and their designated habitats.

Streambed Alteration Agreement

Fish and Game Code, section 1600 et seq. requires the California Department of Fish and Game (CDFG) to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

Native Plant Protection Act of 1977

Fish and Game Code, section 1900 et seq. designates state rare, threatened, and endangered plants.

California Code of Regulations

Title 14, California Code of Regulations, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

LOCAL

Northwestern San Diego County Multiple Habitat Conservation Program

The Multiple Habitat Conservation Program (MHCP) is one of several, large multiple-jurisdictional habitat planning efforts in San Diego County, each of which constitutes a subregional plan under the State of California's Natural Community Conservation Planning (NCCP) Act of 1991. These subregional plans include the:

1. Multiple Species Conservation Program (MSCP),

2. MSCP North County Subarea Program, and

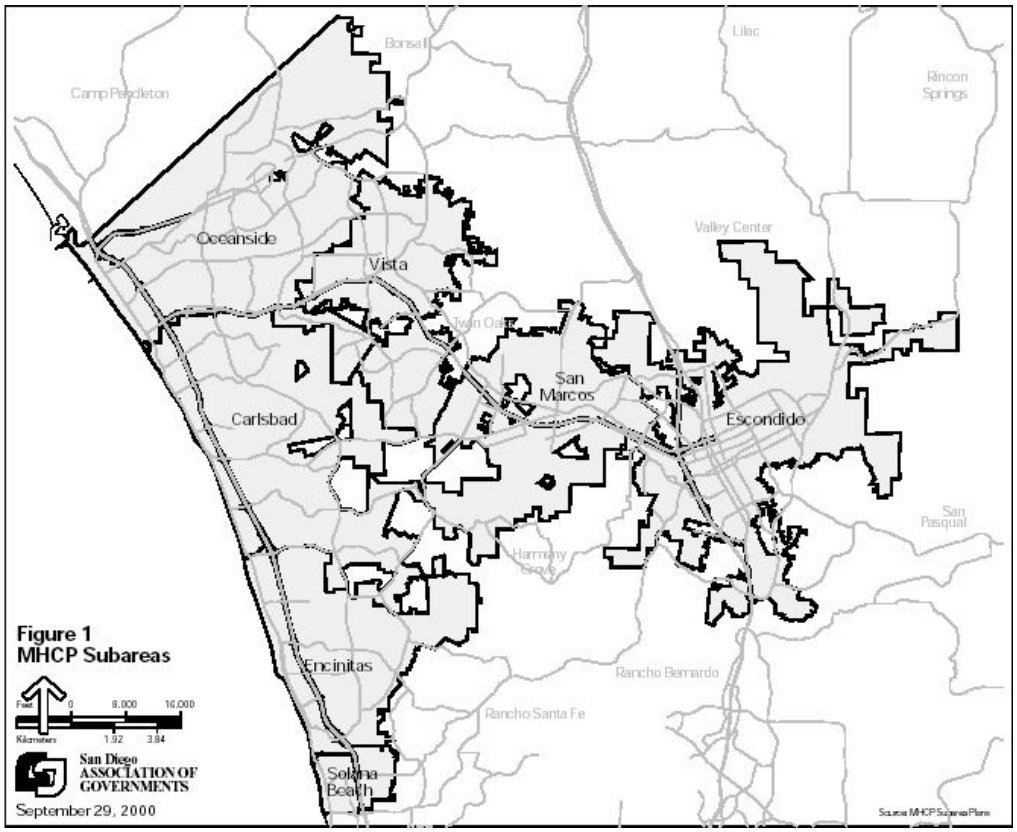
3. Multiple Habitat Conservation Program (MHCP)

The MHCP is a comprehensive, multiple-jurisdictional planning program designed to develop an ecosystem preserve in northwestern San Diego County, including the ERTC/PEP project areas. Implementation of the regional preserve system is intended to protect viable populations of key sensitive plant and animal species and their habitats, while accommodating continued economic development and quality of life for residents of the north county region.

The current MHCP study area encompasses about 186 square miles (111,865 acres) and comprises seven incorporated cities in northwestern San Diego county (Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista; Biological Resources Figure 1). In implementing their respective portions of the MHCP plan, the various, citywide subarea plans describe the specific mechanisms each city will institute for the MHCP. Collectively, the subarea plans, once approved, will contribute to the conservation of biological communities and species in the MHCP study area. In turn, the MHCP plan, in concert with other subregional plans, will contribute to continued ecosystem viability in southern coastal California.

The combination of the subregional MHCP plan and city subarea plans will serve as a multiple species Habitat Conservation Plan (HCP) pursuant to section 10(a)(1)(B) of the federal Endangered Species Act (ESA), as well as an NCCP plan under the NCCP Act and the California Endangered Species Act (CESA). Participating jurisdictions will submit these plans to the USFWS and CDFG in support of applications for permits and authorizations to incidentally take listed threatened or endangered species or other species of concern. “Take authorizations” issued by the wildlife agencies allow for otherwise lawful actions such as development that may incidentally take or harm individuals of a species or its habitat (generally outside of the preserve system) in exchange for conserving the species inside the preserve system. A jurisdiction that is issued a take authorization, referred to as a “take authorization holder,” may share the benefits of that authorization by using it to permit public or private projects that comply with the MHCP and the city’s subarea plan. The conservation and management responsibilities, assurances of implementation, and corresponding authorizations for all parties will be contained in an implementing agreement between each take authorization holder (city) and the wildlife agencies (USFWS and CDFG).

Biological Resources – Figure 1
Multiple Habitat Conservation Program Subareas

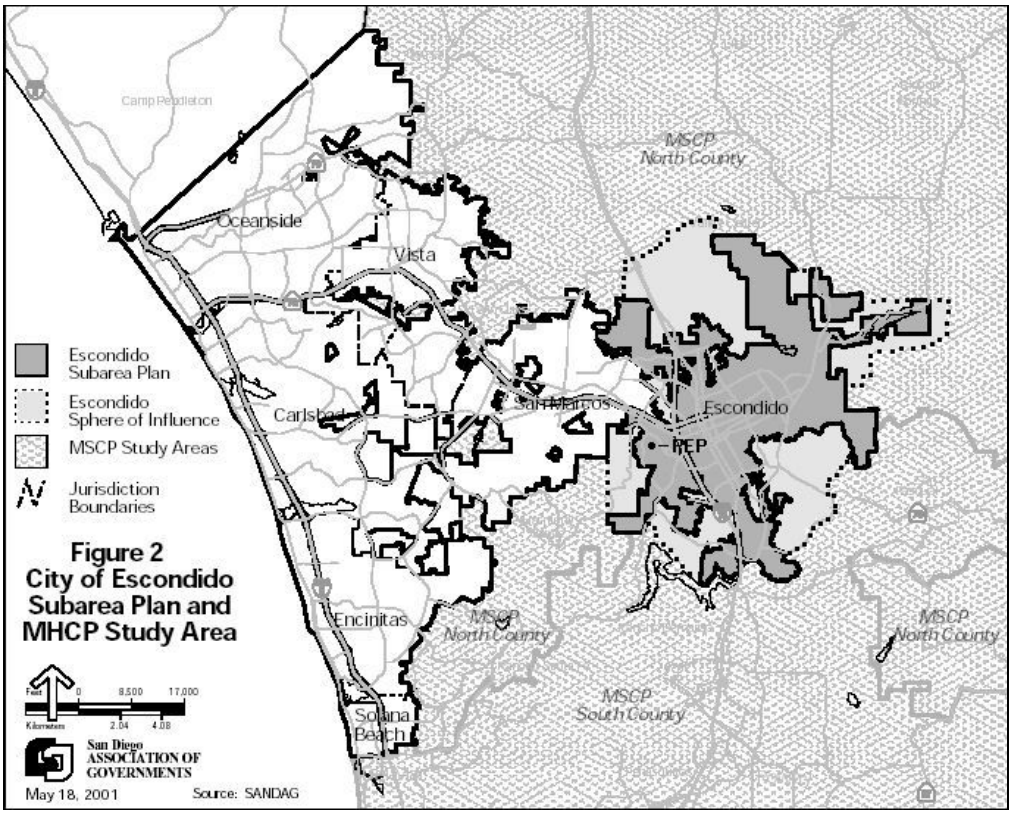


From: *San Diego Association of Governments and MHCP Advisory Committee, 2000. Public Review Draft MHCP Plan, Multiple Habitat Conservation Program: Volume I.*

Escondido Subarea Plan Implementing the Multiple Habitat Conservation Program

Escondido is one of seven cities in northwestern San Diego County that together constitute the MHCP subregion. The City has been involved in the subregional MHCP from its inception in 1991. The Escondido Subarea Plan (Subarea Plan; Biological Resources Figure 2) represents the City of Escondido's contribution to the MHCP and to regional NCCP conservation goals. It comprehensively addresses how the city of Escondido will conserve natural biotic communities and sensitive plant and wildlife species. The planning process for Escondido is an outgrowth of the evolving subregional plan and is completely integrated and consistent with the MHCP. The Subarea Plan is currently in draft form (City of Escondido, 2001a). Permitting of the Subarea Plan is not anticipated before mid- to late-2003 (City of Escondido, 2002b) and will not be likely in time for use by Palomar for this project.

Biological Resources – Figure 2
City of Escondido Subarea Plan and Multiple Habitat Conservation Program Study Area



From: *City of Escondido Planning Division, 2001. Public Review Draft Escondido Subarea Plan Implementing the Multiple Habitat Conservation Program (City Case File 95-25-GPIP).*

SETTING

REGIONAL DESCRIPTION

The PEP is proposed for a site at the southwestern fringe of the urbanized core of the City of Escondido. The area south and southwest of the site is characterized by rural development, eucalyptus groves and fallow agricultural fields. Larger areas of native habitat, interspersed with rural homesites and agricultural land, occur in the more rugged lands to the west and south of the project.

Historically, the Escondido region supported a diversity of vegetation types, including extensive areas of Diegan (coastal) sage scrub, various types of chaparral, annual grasslands, live oak woodlands and riparian areas. Understory disturbance and development during the second half of the twentieth century have degraded much of the live oak woodlands of the region and agricultural expansion, urbanization and invasion of non-native vegetation have progressively degraded much of the remainder of the historic natural habitat.

The loss and fragmentation of habitat in the region has resulted in the elimination of many wildlife species and the reduction of populations of others. Although these areas have been modified from their natural state, a number of special status plants and animals still have the potential to occur in the project vicinity. A list of these species and their legal status is presented in Table 1, below.

BIOLOGICAL RESOURCES - Table 1
Sensitive Species with Potential to Occur in the PEP Vicinity
(Adapted from Palomar 2001a, Appendix F.1)

Sensitive Plants	Status*
California adolphia (*Adolphia californica*)	CNPS List 2
San Diego barrel cactus (*Ferocactus viridescens*)	FSC, CNPS List 2
Mission Canyon blue-cup (*Githopsis diffusa* ssp. *filicaulis*)	FSC, CNPS List 3
Graceful tarplant (*Holocarpha virgata*)	FSC, CNPS List 4
Decumbent goldenbush (*Isocoma menziesii* var. *decumbens*)	CNPS List 1B
San Diego goldenstar (*Muilla clevelandii*)	FSC, CNPS List 1B
Engelmann oak (*Quercus engelmannii*)	CNPS List 4
Wart-stemmed ceanothus (*Ceanothus verrucosus*)	CNPS List 2

Sensitive Wildlife	Status*
Quino checkerspot butterfly (*Euphydryas editha quino*)	FE
Western spadefoot toad (*Scaphiopus hammondii*)	FSC, CSC, FP
Coastal (San Diego) horned lizard (*Phrynosoma coronatum*)	FSC, CSC, FP
Coronado skink (*Eumeces skiltonianus interparietalis*)	FSC, CSC
Orange-throated whiptail (*Cnemidophorus hyperythrus*)	FSC, CSC, FP
Coastal western whiptail (*Cnemidophorus tigris stejnegeri*)	FSC
Coastal rosy boa (*Lichanura trivirgata roseofusca*)	FSC
Two-striped garter snake (*Thamnophis hammondi*)	CSC, FP
Red diamond rattlesnake (*Crotalus ruber exsul*)	FSC, CSC
White-tailed kite (*Elanus leucurus*)	FSC, MBTA, MNMBC, FP
Golden eagle (*Aquila chrysaetos*)	MBTA, CSC, FP
Sharp-shinned hawk (*Accipiter striatus*)	MBTA, CSC
Cooper's hawk (*Accipiter cooperii*)	MBTA, CSC
Loggerhead shrike (*Lanius ludovicianus*)	FSC, MBTA, CSC
California horned lark (*Eremophila alpestris actia*)	MBTA, CSC
California gnatcatcher (*Polioptila californica*)	FT, MBTA, CSC
Western bluebird (*Sialia mexicana*)	MBTA
Rufous-crowned sparrow (*Aimophila ruficeps canescens*)	CSC
Bell's sage sparrow (*Amphispiza belli*)	FSC, CSC
San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)	FSC, CSC
Dulzura California pocket mouse (*Perognathus longimembris pacificus*)	FSC, CSC
Northwestern San Diego pocket mouse (*Chaetodipus fallax*)	FSC, CSC
San Diego desert woodrat (*Neotoma lepida intermedia*)	FSC, CSC

***STATUS LEGEND:** FE = Federally listed Endangered; FT = Federally listed Threatened; FSC = Federal Species of Concern; MNMBC = Fish & Wildlife Service, Migratory Non-game Birds of Management Concern; MBTA = Federally Protected under the Migratory Bird Treaty Act; CSC = California Species of Special Concern, FP = California Fully Protected Species; California Native Plant Society (CNPS 2001) List 1B = Rare, threatened or endangered plants in California and elsewhere; CNPS List 2 = Rare, threatened or endangered plants in California, but more common elsewhere; CNPS List 3 = Plants needing more information, a review list; CNPS List 4 = Plants of limited distribution, a watch list.

SITE VICINITY DESCRIPTION

The proposed PEP site and water/wastewater pipeline route occur within the "Southwestern Habitat Area," as identified in the Subarea Plan. The Southwestern Habitat Area supports native habitats, including degraded and fragmented stands of coastal sage scrub, chaparral, live oak woodland and small extents of riparian vegetation. Surrounding rural development, habitat fragmentation and lack of suitable soil types limits the potential occurrence of special status plants and animals in the immediate site vicinity. The PEP site and remainder of the Escondido Research and Technology Center (ERTC) Specific Plan Area (SPA) are not identified in the draft Subarea Plan as conservation areas.

Escondido Creek flows from northeast to southwest through the SPA, approximately 2,500 feet southeast of the power plant site (Planning Area 1). Most of this creek is concrete-lined through the City of Escondido and, downstream of this channelized portion, supports riparian habitat that has been degraded by fragmentation and colonized by invasive, non-native plants.

Special status species occurring within the project vicinity include the wart-stemmed ceanothus, Cooper's hawk, California gnatcatcher, rufous-crowned sparrow, loggerhead shrike, and western spadefoot toad. The wart-stemmed ceanothus is restricted to the poorly represented chaparral habitat southwest of the project and more extensively represented farther south and west of the project, within relatively intact, pristine habitat. The Cooper's hawk is a regular breeder in the area's oak and riparian woodlands. The California gnatcatcher and rufous-crowned sparrow are also extensively represented to the south and west of the project within coastal sage scrub habitats. The shrike is a species commonly associated with grasslands and agricultural landscapes and occurs throughout open agricultural regions of San Diego County, but is poorly represented in the regional databases due to its marginal sensitivity and a consequent under-reporting of occurrences.

Power Plant Site

The proposed PEP site and linear facilities (transmission line, natural gas line, and reclaimed water line) are located on a vacant 20-acre parcel (Planning Area 1) within a planned 186-acre (ERTC) industrial park in the City of Escondido, west of I-15 and south of SR-78, southwest of the intersection Vineyard Avenue and Enterprise Street, in the northwest quarter of section 20, Township 12 South, Range 2 West in San Diego County. The project is at the southwestern perimeter of the industrial/commercial area of the City of Escondido, where land use transitions to rural and semi-rural.

The ERTC project and a draft Specific Plan for the ERTC are currently undergoing a California Environmental Quality Act (CEQA) review, with the City of Escondido (City) as Lead Agency. The City released a draft Environmental Impact Report (EIR) on July 16, 2002. The City's Planning Commission and City Council are expected to consider a final EIR for the project in early October. A decision on the ERTC Specific Plan is expected in November.

The City and the Energy Commission staff have executed a Memorandum of Understanding to coordinate the environmental and permitting reviews of the PEP and

the ERTC Specific Plan. The ERTC Specific Plan includes modifications necessary for the PEP to comply with local LORS. Because the PEP is physically dependent on the development of the ERTC, the approval of the PEP by the Energy Commission cannot occur until the City completes its EIR process and approves the ERTC specific plan.

In its current condition, the PEP site consists of a central graded area with a largely cleared slope (formerly an avocado and citrus grove) to the north and naturally vegetated slopes to the south. The three vegetation series occurring on the power plant site and along the water pipeline route are coastal sage scrub, annual grassland and eucalyptus.

Portions of the northern end of the power plant site have been scraped in the past, and are currently devoid of vegetation and highly disturbed. Abandoned orchards in the extreme northern portion of the site currently support annual grassland with occasional trees, stumps and sagebrush shrubs. This area also contains three depressions that retain water into the spring, the two largest of which support breeding western spadefoot toads.

The central and southern portions of the plant site are less disturbed than the northern portion and are dominated by coastal sagebrush scrub.

Water Supply / Wastewater Return Pipeline

Reclaimed water for the PEP cooling system will be supplied from the City of Escondido's Hale Avenue Resource Recovery Facility (HARRF) via a new 1.1-mile, 16-inch supply pipeline. Blowdown from the circulating water system will be returned to the HARRF via an 8-inch return pipeline routed alongside the reclaimed water supply line. The proposed pipeline route will traverse degraded annual grasslands and a small stand of blue gum eucalyptus in the southern portion of the ERTC. It would then turn eastward and follow the paved Harmony Grove Road through an existing urbanized area and terminate at a tie-in to an existing City of Escondido reclaimed water pipeline near the end of the concrete-lined portion of the Escondido Creek flood control channel.

Transmission Line

The plant switchyard will be directly connected with the San Diego Gas and Electric (SDG&E) transmission system via a proposed loop in the existing 230 kV Escondido-Sycamore Canyon transmission line that runs along the site's western boundary. The PEP, therefore, will not require construction of any new transmission lines.

Natural Gas Pipeline

Natural gas will be delivered to the PEP via an existing 16-inch natural gas line that terminates immediately adjacent to the northeast corner of the project site, at the end of Enterprise Street. In order to relieve a bottleneck in a segment of the existing SDG&E gas system, approximately one mile northeast of the project area, SDG&E will construct an upgrade of approximately 2,600 feet of 16-inch pipeline within existing roadways. The PEP will, therefore, not require construction of any new gas pipelines.

IMPACTS

PROJECT SPECIFIC DIRECT AND INDIRECT IMPACTS

The CEQA Guidelines define direct impacts as those directly attributable to, and occurring at the same time and place, as the project. Indirect impacts are caused by the project, but can occur at a (reasonably foreseeable) later time or at a farther distance.

Direct Impacts

The PEP will be developed in Planning Area 1 of the SPA. Prior grading of the industrial park will have fully disturbed the biological resources of Planning Area 1 before PEP construction begins. About half of the power plant's proposed water/wastewater pipeline route will be within areas of the SPA that will be disturbed before power plant construction begins, and the other half will be within existing roadways. The short natural gas pipeline (SDG&E) upgrade segment will be installed entirely within existing paved city streets, where there are no biological resources. There will be virtually no direct biological impacts of the PEP if the facilities are constructed in areas that already have been thoroughly modified from current conditions before power plant construction begins (Palomar 2001a). The biological impacts of the ERTC industrial park are being addressed in a separate CEQA review by the City of Escondido. The Draft Environmental Impact Report was released for public comment on July 16, 2002.

Section 15125 of the CEQA guidelines directs that "*An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist … at the time the environmental analysis is commenced… This environmental setting will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant*." Consequently, the Energy Commission is required to use current physical and biotic conditions as the baseline for this analysis and cannot assume presence of the business park and set an arbitrary baseline at some, as yet unrealized state of its development.

Using current biological conditions on the site as the baseline for this analysis, the PEP will contribute to the overall habitat impacts associated with the construction of the ERTC industrial park. These contributions include construction of: (1) the power plant, which will result in a permanent loss of native habitat, and (2) the water supply / wastewater return pipeline, which will result in temporary habitat impacts. These temporary and permanent habitat impacts will affect several special status wildlife species, requiring appropriate habitat compensation and other mitigation measures.

Habitat Acreage Impacts of Proposed Facilities

Grading of Planning Area 1 for the PEP will result in the permanent loss of 14.4 acres of natural habitat (coastal sage scrub and annual grassland), 5.5 acres of agricultural / disturbed habitat, 0.1 acre of seasonally ponded depressions, 950 ft^2 (0.02 acre) of a west-to-east running seasonal streambed (Waters of the U.S.), and 2,180 ft^2 (0.05 acre) of jurisdictional wetland, consisting of a small stand of mixed willow vegetation along the eastern property boundary (Table 2).

BIOLOGICAL RESOURCES – Table 2
PEP HABITAT ACREAGE IMPACTS

Vegetation Type	Permanent Acreage Impacts		
	Power Plant	Water Pipeline	Total
Coastal Sage Scrub	6.9	(0.5)*	6.9
Annual Grassland	7.5	(1.5)*	7.5
Live Oak Woodland	-	-	-
Mixed Willow	0.05(1)	-	0.05
Mule fat	-	-	-
Disturbed / Agricultural	5.5	0.6	6.1
Eucalyptus	-	0.1	0.1
Seasonal Ponds & Drainages	0.1	-	0.1
Urban	-	1.1	1.1
Other Waters of the U.S.	0.02(1)	-	0.02
Total	**20.07**	**3.8**	**21.87**

* These acreage amounts are included in the power plant totals in the previous column

(1) From Tables 3 and 4 (p. 10, 11) of Wetland Delineation Report (Merkel & Assoc. 2002 in Palomar 2002b).

Impacts to Sensitive Species

Removal of 6.9 acres of native coastal sage scrub habitat associated with preparation of Planning Area 1 for the PEP will result in the displacement of nesting territories of two pairs of California gnatcatchers and the removal of several ponded depressions (0.1 acre) in the northern portion of the site that serve as habitat for western spadefoot toads that are known to occupy these ponds and are found nowhere else in the SPA.

Indirect Impacts

Prior to PEP construction, ERTC development will largely remove the habitats and species on or near the proposed plant site and water / wastewater pipeline route that could be potentially impacted by power plant construction. The direct impacts of the PEP are discussed above and its contribution to regional, cumulative impacts is discussed in the following section.

While PEP construction would have no significant indirect impacts on biological resources, potential indirect impacts of power plant operations include those related to noise and light emissions, potential modifications to the drainage discharge from the site, and effects of air emissions on the regional vegetation and sensitive species and their habitat.

Air Emissions

The nearest known observation to the SPA of the Quino checkerspot butterfly (QCB) was reported in 1932 near Lake Hodges, approximately two miles southeast of the site. The closest recent (2000) QCB observation was approximately 28 miles northeast of the site in Riverside County. The project site, itself, is outside the QCB survey area, designated under USFWS QCB protocol, and no butterflies were found in the project area during surveys for this species conducted by the applicant (Palomar, 2001a; Appendix F.2). Because of the planned use of natural gas, containing only trace amounts of sulfur, and NO_x emission control technologies, no significant impacts to vegetation or wildlife are anticipated from project air emissions. Energy Commission

and USFWS staff (USFWS, 2002) therefore, have no concerns regarding potential impacts to this species by the proposed power plant or ERTC industrial park.

Onsite Drainage

Inadequate controls in routing onsite drainage can lead to uncontrolled discharges, which can cause erosion and deposition of sediments, damaging vegetation and smothering downstream aquatic communities. As the PEP drainage systems will conform to current engineering standards and applicable regulatory requirements, protecting downstream areas (Palomar, 2001a), staff does not consider erosional or depositional impacts to be likely.

Operations Lighting and Noise

Long-term operations-phase lighting and noise emissions could lead to avoidance of the area by some wildlife and/or interfere with breeding activities. However, with development of the industrial park, there will be only limited natural habitat remaining in the immediate vicinity of the power plant. Though some areas of the SPA will be left in their natural state, the PEP facility will be more than 200 yards from these areas at its closest point, so staff concludes that these impacts are not considered significant.

CUMULATIVE IMPACTS

The California Environmental Quality Act defines cumulative impacts as "*two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts*." Cumulative impacts can occur when individually minor, but collectively significant projects take place over time.

Direct, indirect, and cumulative impacts to sensitive species and the loss of habitat are critical issues in the San Diego County region, since many sensitive species occur in the area. Consequently, state, federal and county agencies have been working together for some time to develop regional and subregional strategies to help minimize sensitive species impacts. The Multiple Habitat Conservation Program (MHCP) administered by the County of San Diego is the prime example of this regional species protection strategy. One of the principal strategies to address habitat impacts is to require developers to provide habitat compensation when habitat losses are anticipated for development projects, including energy projects.

Despite mitigation measures taken to preserve biological resources in each of the Planning Areas of the proposed ERTC, the cumulative impact of these proposed developments on sensitive species and habitats is adverse and significant. The projects will significantly reduce the amount of certain sensitive habitats such as wetlands, Diegan coastal sage scrub, and annual grasslands, lead to significant impacts to several state or federally listed sensitive animals, possibly impinge upon regionally significant wildlife corridors, and eliminate identified high-quality California gnatcatcher habitat.

Revegetation efforts, onsite and offsite habitat re-creation, and offsite habitat preservation can offset some of these impacts. At this time, the MHCP is in the CEQA review process (final EIR anticipated by end of 2002). Implementing agreements with resource agencies are not anticipated before mid-2003 (City of Escondido, 2002b). For

the PEP, Palomar has proposed to provide suitable habitat compensation for the project's contribution to cumulative, temporary and permanent habitat impacts of the ERTC, in accordance with the Subarea Plan. At this time, it is expected that habitat compensation will occur at an agency-approved habitat mitigation bank located in the general vicinity of the proposed power plant site. By doing so, Palomar will be addressing the cumulative impact concerns by providing habitat compensation in accordance with regional conservation plans established for San Diego County and the City of Escondido that are designed to account for anticipated direct and cumulative effects of development.

The projects considered in the cumulative impacts analysis include:

1. The 49.5 megawatt CalPeak power plant, constructed on 2.95 acres of vacant industrial property on North Enterprise Street in Escondido, adjacent to the northern boundary of the PEP;

2. The 44 megawatt RAMCO power plant (now owned by P.G.&E.), constructed on an approximately three-acre urban industrial site, approximately 0.5 mile northwest of the PEP; and

3. The ERTC industrial park, of which the PEP is one component (Planning Area 1).

A discussion of the specific contribution of the proposed power plant and water / wastewater pipeline to cumulative habitat impacts of the ERTC industrial park is presented in the following sections.

Habitat Acreage Impacts of Proposed Facilities

Table 3 presents the habitat acreage impacts associated with all portions of the PEP in relation to the proposed ERTC.

BIOLOGICAL RESOURCES – Table 3
CUMULATIVE HABITAT ACREAGE IMPACTS

Vegetation Type	Permanent Acreage Impacts					
	Palomar Energy Project		Remainder of ERTC			
	Power Plant	Water Pipeline	(Planning Areas 2-8) [2]	CalPeak	RAMCO	Total
Coastal Sage Scrub	6.9	(0.5)*	45.1			**52.0**
Annual Grassland	7.5	(1.5)*	95.3			**102.8**
Live Oak Woodland	-	-	1.2			**1.2**
Mixed Willow	0.05[1]	-	0.13			**0.18**
Mule fat	-	-	0.02			**0.02**
Disturbed / Agricultural	5.5	0.6	28.4			**34.5**
Eucalyptus	-	0.1	10.9			**11.0**
Seasonal Ponds & Drainages	0.1	-	-			**0.1**
Urban	-	1.1	4.1	**2.95**	**3.00**	**11.15**
Other Waters of the U.S.	0.02[1]	-	0.06			**0.08**
Total	**20.07**	**3.8**	**185.21**	**2.95**	**3.00**	**213.03**

* Sage scrub and grassland acreage amounts are included in the power plant totals in the previous column
(1) From Tables 3 and 4 (p. 10, 11) of Wetland Delineation Report (Merkel & Assoc. 2002 in Palomar 2002b).
(2) All jurisdictional waters and streambeds within the limits of the SPA (Planning Areas 1-8) are anticipated to be impacted, with the exception of those wetland resources within the areas to be preserved in Planning Areas 6 and 7 and within Planning Areas 9 and 10, which are not a part of the ERTC (Merkel & Associates, 2002 in Palomar 2002b).

The preparation of Planning Area 1 for the PEP will result in 11 percent of the overall habitat impacts of the ERTC.

Table 4 presents the permanent acreage impacts to waters and wetlands associated with all portions of the proposed PEP in relation to the remainder of the ERTC. The preparation of Planning Area 1 for the PEP will result in 25 percent of the overall waters and wetlands impacts of the ERTC.

BIOLOGICAL RESOURCES – Table 4
PEP vs. ERTC WATERS OF THE U.S. AND WETLAND ACREAGE IMPACTS

Jurisdictional Wetlands	Permanent Acreage Impacts		
	PEP	Remainder of ERTC Planning Areas 2-8*	Total
Mixed Willow	0.05	0.13	0.18
Mule fat	-	0.02	0.02
Non-Wetland Waters of the U.S.	0.02	0.06	0.08
Total	**0.07**	**0.21**	**0.28**

* Waters and wetlands in Planning Areas 6, 7, 9 & 10 will not be impacted by ERTC development.

The seasonally-ponded depressions at the project site support higher resource values than the ephemeral channels (i.e. habitat for western spadefoot toads). These areas are isolated waters and, though not subject to federal regulatory purview, are considered waters of the state and regulated through Water Discharge Requirements under the Porter-Cologne Act (Water Code 1300 et seq.). The loss of these ponded depressions will remove habitat for western spadefoot toads that are known to occupy these ponds and are therefore also subject to CDFG mitigation requirements.

Impacts to Sensitive Species

Development of the ERTC would directly impact as many as 14 individual California gnatcatchers, including six breeding pairs and associated offspring. The two nesting pairs that occur on the PEP site represent approximately 33 percent of the total gnatcatchers observed in the SPA.

Biologists observed a Coronado Skink during a previous survey (Dudek, 1998) of the SPA. No mention is made in the AFC as to where on the SPA this federal and state special concern species was encountered, whether potential impacts to the species are anticipated, and, if so, how these impacts would be mitigated.

Impacts on Wildlife Movement Corridors

The section of Escondido Creek within the SPA, near the proposed water pipeline, is used as a foraging area for locally present, mid-sized mammals, such as the raccoon (*Procyon lotor*). However, this section of the creek is probably not critical to regional movements of large mammal species due to the lack of connectivity through the extensive concrete-lined sections of channel that traverse the urbanized core of Escondido, upstream of the project vicinity. Construction of the proposed PEP pipeline is not anticipated to impact the Escondido Creek channel area and, consequently, will not affect local mammal movement patterns.

Because the SPA lacks a contiguous connection to core conservation areas and contains fragmented and degraded habitat, it is not recognized in the Subarea Plan as an important core conservation corridor. Birds of various species undoubtedly pass through the SPA and vicinity during migration periods; however, this area is not expected to provide important stop-over habitat for migrants.

The general discussion of corridors and connectivity in the AFC refers to the habitat in the project area as "fragmented and degraded". While this may be true from a botanical perspective, it downplays the site's value to the as many as six California gnatcatcher nesting territories identified on the SPA – apparently one of the largest concentrations within the City of Escondido. Consequently, the SPA could have some potential value as a 'stepping-stone' corridor / linkage for California gnatcatchers and possibly other coastal sage scrub bird species, especially as it seems to be of sufficient size to support one or more breeding territories. Unless there is a more direct or otherwise better stepping-stone linkage for these species, the loss of this site could further reduce an already compromised north-south regional link. CDFG biologists (CDFG, 2002, pers. comm. with David Mayer) and Energy Commission staff request a more detailed and expanded discussion of wildlife corridors to determine the value of the PEP site as a “stepping-stone” corridor for California gnatcatchers.

FACILITY CLOSURE

If the PEP is constructed, it will likely experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee

what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. For more information, see "General Conditions, Including Compliance Monitoring and Closure Plan" for the PEP and Biological Resources Condition of Certification **BIO-7**.

PLANNED OR UNEXPECTED PERMANENT FACILITY CLOSURE

The region surrounding the proposed project site is a mosaic of disturbed and relatively undisturbed habitat. The various habitats provide food, cover and other necessary requirements for the rare and common species found in the region. Consequently, facility closure must address site restoration measures, as appropriate, when a planned or an unexpected permanent facility closure occurs. Site restoration measures, if implemented, will address such tasks as the removal of all power plant structures and appropriate implementation of habitat restoration measures.

UNEXPECTED TEMPORARY CLOSURE

Staff does not recommend any biological resource facility closure measures to address an unexpected temporary closure of the proposed power plant. However, in the event that the Energy Commission concludes that the facility is permanently closed, the above-mentioned permanent facility closure measures should mitigate the potential impacts to biological resources.

MITIGATION

MITIGATION PROPOSED FOR THE ERTC (AND PEP)

Habitat Compensation for Direct Impacts of ERTC Development

The mitigation of impacts of the ERTC, including Planning Area 1 (proposed power plant site), is also being addressed by the City of Escondido in a separate CEQA review and permitting process. Habitat replacement to compensate for habitat loss is the major element of the proposed mitigation program. Palomar does not propose specific habitat compensation for losses due to construction of the power plant and associated infrastructure, independent of that proposed for the ERTC.

Proposed mitigation of habitat impacts of the ERTC (and PEP) conforms to the compensation ratios established in the Subarea Plan. While this plan has not yet been adopted, it does provide a framework for addressing impacts to resources within the City and its sphere of influence. And while it does not yet fully address the permitting and conservation obligations associated with listed species, it does provide a foundation for making mitigation recommendations that are consistent with implementation of the Subarea Plan's conservation objectives.

Table 5 summarizes mitigation proposed for habitat losses in Planning Area 1 (PEP Site) of the ERTC in relation to the remainder of the SPA.

BIOLOGICAL RESOURCES – Table 5
PROPOSED HABITAT MITIGATION FOR ERTC HABITAT IMPACTS

Vegetation Type	*Mitigation Ratio*[1]	Planning Area 1 (Power Plant)				Remainder of ERTC (*Planning Areas 2-8*)		Total	
		Power Plant		Water Pipeline[4]					
		Impact (Acres)	Mitigation (Acres)	Impact (Acres)	Mitigation (Acres)	Impact (Acres)	Mitigation (Acres)	Impact (Acres)	Mitigation (Acres)
Coastal Sage Scrub	*2:1*[2]	6.9	13.8	0.5	1.0	41.5	83	48.9	97.8
Annual Grassland	*0.5:1*	7.5	3.8	1.5	0.75	95.3	47.7	104.3	52.25
Coastal Live Oak Woodland	*3:1*[3]	-	-	-	-	1.2	3.6	1.2	3.6
Mixed Willow / Mule fat	*3:1*	0.05[5]	0.15[6]	-	-	0.15	0.45	0.2	0.6
Waters of the U.S.	*3:1*	0.02[5]	0.06[6]	-	-	0.06	0.18	0.08	0.24
Total		**14.47**	**17.81**	**2.0**	**1.75**	**138.21**	**134.93**	**155.43**	**156.74**

(1) Ratios recommended in Escondido Subarea Plan implementing the MHCP
(2) Required ratio for gnatcatcher-occupied coastal sage scrub.
(3) Includes 10:1 replacement of individual trees that meet minimum size requirements
(4) From AFC, Table 5.3-1 (p. 5.3-20) and Table 5 (p. 32) of Appendix F.1 (Palomar, 2001a).
(5) From Tables 3 and 4 (p. 10, 11) of Wetland Delineation Report (Merkel & Assoc. 2002 in Palomar 2002b).
(6) Not addressed in AFC.

While other habitat types will also be impacted, compensation is not required under the Subarea Plan. PEP / ERTC habitat acreage impacts not requiring habitat compensation are identified in Table 6, below.

BIOLOGICAL RESOURCES – Table 6
ACREAGE IMPACTS NOT REQUIRING HABITAT COMPENSATION

Vegetation Type	Acreage Impacts		
	PEP		Remainder of ERTC
	Power Plant	Water Pipeline[1]	(Planning Areas 2-10)
Disturbed / Agricultural	5.5	0.6	28.4
Eucalyptus	-	0.1	10.9
Seasonal Ponds & Drainages	0.1	-	-
Urban	-	1.1	4.1
Total	**5.6**	**1.8**	**43.4**

(1) From AFC, Table 5.3-1 (p. 5.3-20) and Table 5 (p. 32) of Appendix F.1 (Palomar, 2001a).

The proposed mitigation package for permanent and temporary habitat impacts of the ERTC, consistent with the Subarea plan, is as follows:

1. Based on project impact estimates, including impacts to vegetation associated with the proposed offsite waterlines, the required habitat-based mitigation (identified in Table 5) follows the proposed standards set forth in the draft Escondido Subarea Plan.

   Mitigation would require a 2:1 habitat compensation ratio for California gnatcatcher-occupied sage scrub acreage and conservation of an equal number of California

gnatcatchers within a preserve system. This acquisition will occur within the Subarea Plan Focused Planning Areas (FPAs), or in occupied California gnatcatcher habitat that has been identified by the MHCP within the unincorporated San Diego County core area, or in other areas approved by the City, State, and Federal jurisdictional agencies.

Mitigation for coastal sage scrub habitat would adhere to the acreage requirements cited in Table 5. These mitigation requirements will also be fulfilled within the FPAs identified in the Escondido Subarea Plan implementing the MHCP. Mitigation shall be in place to the satisfaction of the CPM and City's Planning Director prior to issuance of a grading permit.

2. Direct impacts to California gnatcatchers would be adequately addressed through habitat conservation that also supports an equivalent number of gnatcatchers.

3. Western spadefoot toad impacts and seasonal basin areas would be mitigated through creation or restoration of an equivalent acreage of habitat that supports seasonal ponds in preserve lands within the MHCP FPAs. Mitigation shall be in place to the satisfaction of the CPM and City's Planning Director for approval prior to issuance of any grading permit.

4. Construction activities would be initiated during the nonbreeding season for California gnatcatchers (August 30 through February 14). Work that would be completed during this period includes site boundary demarcation with construction fencing along the edge of retained coastal sage scrub, and all clearing and grubbing. This mitigation shall be placed as a condition on the Tentative Map and Grading Permit.

5. In the event that any nighttime construction is allowed, night construction activities would be initiated prior to the onset of the California gnatcatcher breeding season (prior to February 15). Alternatively, prior to conducting any night construction activities, a qualified biologist would determine that no California gnatcatcher breeding is occurring within 300 feet of areas that would be lighted. In the event that California gnatcatchers are found in proximity to areas to be lighted, a verification of adequate light shielding would be made by a qualified biologist prior to commencing night work. This mitigation shall be placed as a condition on the Tentative Map and Grading Permit.

6. Facility lighting would be shielded such that no direct lighting falls within the adjacent natural habitat. Adequate directional lighting or shielding would be installed to control nighttime illumination at the industrial park in a manner that does not enhance light levels within adjacent native habitat areas. This mitigation shall be placed as a condition on the Specific Plan and Conditional Use Permit.

7. For offsite improvements (i.e., Vineyard Avenue and Valley Parkway), when project-specific engineering has been completed, the City shall ascertain the acreage of impacts and implement mitigation in accordance with the ratios above and implement the same mitigation measures as previously indicated.

MITIGATION PROPOSED BY STAFF

Habitat Compensation for ERTC (PEP) Direct Impacts

While the Energy Commission staff's review specifically addresses the impacts of the PEP, staff supports the ERTC-proposed habitat compensation package and other specific measures to address temporary and permanent habitat impacts (see Conditions of Certification **BIO-1** and **BIO-8**) and is working closely with the City of Escondido to ensure coordination between projects. Habitat compensation at one or more approved conservation banks near the project is appropriate to address ERTC off-site habitat compensation requirements. Compensation lands (i.e. coastal sage scrub and aquatic spadefoot toad habitat) will be acquired as contiguous blocks in areas that currently support these species, as conservation of an equal number of individuals is also a mitigation condition required under the Subarea Plan. Staff therefore recommends that the City include the following as part of its analysis and approval of the ERTC:

1. A detailed discussion (and map) of the specific locations of the agency-approved, local conservation banks in the immediate vicinity of the proposed project site proposed as mitigation sites;

2. Coordination with the Wildlife Agencies and the City of Escondido on the final selection of these sites; and

3. Verification that the proposed sites contain suitable habitat acreage credits available for purchase.

Staff also proposes that the project owner retain a qualified biologist (Designated Biologist) to monitor site (Planning Area 1) preparation for the power plant and water supply pipeline construction. For more information, see Conditions of Certification **BIO-2, BIO-3**, and **BIO-4**.

The Designated Biologist will also be responsible for developing and implementing a Worker Environmental Awareness Program (WEAP) and the Biological Resources Mitigation Implementation and Monitoring Program (BRMIMP). For more information, see Conditions of Certification **BIO-5** and **BIO-6**.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The proposed project must comply with various state, federal, and county laws, ordinances, regulations, and standards that address state and federally listed species, as well as other sensitive species, and their habitats.

Because the proposed ERTC site is occupied by the California gnatcatcher, a federally threatened species, the industrial park must be constructed in accordance with the terms and conditions provided in a federal section 7 Biological Opinion issued by the USFWS. The Biological Opinion will incorporate mitigation measures identified in the Subarea Plan implementing the County of San Diego Multiple Habitat Conservation Program (MHCP) and Biological Mitigation Ordinance (BMO). It is incumbent upon

Palomar to demonstrate that this project complies with the provisions of the Subarea Plan and BMO. This information must be included as part of the project description for the Section 7 consultation.

This may be accomplished via one of the following:

1. Section 4(d) Take Authorization: If the City has available 4(d) credits, the project may be able to receive authorization through this process. This process requires concurrence by the USFWS and CDFG.

2. Section 10(a)(1)(B) Incidental Take Permit: In the event that the City does not have 4(d) credits available or the USFWS or CDFG do not concur, the project may need to obtain an individual take permit. This would require preparation of a Habitat Conservation Plan that would be approved by the USFWS.

3. Authorization under the City's Subarea Plan (Multiple Habitat Conservation Program): In the event that the City receives approval of their Subarea Plan prior to project implementation, take authorization could be obtained through this process.

The ERTC has applied for a federal Clean Water Act section 404 permit and a CDFG Streambed Alteration Agreement, and has petitioned the RWQCB for a Clean Water Act section 401 certification or waiver. Palomar will need to ensure compliance with the permit, agreement and certification. Staff recommends that copies of the permit, agreement and certification be provided to the Energy Commission and that the terms and conditions contained in these documents be incorporated into mitigation proposed for the ERTC (see Condition of Certification **BIO-6**).

The seasonally-ponded depressions at the power plant site that support western spadefoot toads are "isolated waters." Though not subject to federal regulatory purview, these "isolated waters" are considered waters of the state and consequently regulated through Water Discharge Requirements under the Porter-Cologne Act (California Water Code section 1300 et seq.). Consequently, the applicant will need to file a report of waste discharge with the appropriate Regional Water Quality Control Board (RWQCB).

UNRESOLVED ISSUES, CONCLUSIONS, AND RECOMMENDATIONS

UNRESOLVED ISSUES

Habitat Acreage Impacts of Proposed Facilities

1. The impacts of the proposed power plant on mixed willow vegetation in Planning Area 1 are not indicated in Table 5.3-1 (p. 5.3-20) of the AFC and are not stated consistently between Table 4 (p. 31) of Appendix F.1 (Merkel & Associates, 2001 in Palomar, 2001a), and Tables 3 and 4 of the Wetland Delineation Report included in the ERTC Clean Water Act section 404 Application Package (Attachment 22-1; Palomar, 2002a). These discrepancies are indicated in Table 7 below:

BIOLOGICAL RESOURCES – Table 7

PEP IMPACTS TO MIXED WILLOW HABITAT IN PLANNING AREA 1

Source	Mixed Willow	Waters of the U.S.
Table 5.3-1 (p. 5.3-20) of the AFC	-	-
Table 4 (p. 31) of Appendix F.1 (Merkel & Associates, 2001 in Palomar, 2001a)	0.0	-
Table 6 (p. 38) of Appendix F.1 (Merkel & Associates, 2001 in Palomar, 2001a)	0.0	-
Tables 3 and 4 of the Wetland Delineation Report in the ERTC Clean Water Act section 404 Application Package (Attachment 22-1; Palomar, 2002a)	0.05 acre	0.02 acre

"-" no value indicated in the respective Table

Appropriate mitigation for impacts to waters and wetlands are currently not included in Table 5.3-1 of the AFC.

2. Impacts of the proposed water pipeline, described in Table 5 of Appendix F.1 of the AFC (Palomar, 2001a), are not reflected in Table 5.3-1 of the AFC.

3. The AFC and supporting documents indicate that impacts of the proposed ERTC are anticipated in Planning Areas 1-8 (see p. 17 of Appendix F.1 of the AFC [Palomar 2001a] and p. 3 of the Wetland Delineation Report included in the ERTC Clean Water Act section 404 Application Package [Attachment 22-1; Palomar, 2002a]). Tables 4 and 6 of Appendix F.1 of the AFC (Palomar, 2001a) and Table 4 of the Wetland Delineation Report included in the ERTC Clean Water Act section 404 Application Package (Attachment 22-1; Palomar, 2002a), however, do not apparently accurately reflect impacts in all of these Planning Areas and are not consistent with the acreage amounts of mixed willow/mule fat habitats and "non-wetland waters of the U.S." in, as indicated in Table 8 below:

BIOLOGICAL RESOURCES – Table 8
PEP vs. ERTC IMPACTS TO WATERS AND WETLANDS

Source	Mixed Willow (acres)		Mule fat (acres)		Non-wetland waters of the U.S. (acres)	
Planning Area	***1***	***2-8***	***1***	***2-8***	***1***	***2-8***
Table 4 of Appendix F.1 of the AFC (Palomar, 2001a)	-	0.0	0.0	0.1	-	-
Table 6 of Appendix F.1 of the AFC (Palomar, 2001a)	0.0	0.1[(1)]	-	-	-	-
Table 3 of the Wetland Delineation Report included in the ERTC Clean Water Act section 404 Application Package (Attachment 22-1; Palomar, 2002a)	0.05	0.13	0.0	0.02	0.02	0.06
Table 4 of the Wetland Delineation Report included in the ERTC Clean Water Act section 404 Application Package (Attachment 22-1; Palomar, 2002a)	0.05	0.04[(2)]	-	0.02[(2)]	0.02	0.06[(2)]

(1) Mixed willow and mule fat combined in total
(2) Impacts to Planning Areas 2-5 only. Potential impacts to Planning Area 8 not included in this total.

In light of the above inconsistencies, staff has developed its recommended mitigation (see Table 5) to address the most conservative (i.e. maximum) impact acreages presented. If the applicant feels that staff recommendations in Table 5 are incorrect, then impact acreages for waters and wetlands will need to be reconciled.

Impacts on Sensitive Species

Biologists observed a Coronado skink during a previous (Dudek, 1998) survey of the SPA. No further mention is made in the AFC as to where in the SPA this federal and state special concern species was encountered, whether potential impacts of the PEP on the species are anticipated, and, if so, how these impacts would be mitigated. Staff requests more information on where within the SPA this species was observed in 1998 and what, if any, mitigation is proposed if the species occurs on the PEP site.

Impacts to the Coronado Skink can be adequately achieved through the compensation for coastal sage scrub habitat impacts, as proposed by the applicant as mitigation for impacts to the California Gnatcatcher. Although having an extremely restricted range in the US, this skink is not uncommon within good-quality, native oak/riparian woodland, sage scrub, and chaparral habitat. It is not easily detected however, except for brief periods following seasonal rains (often found under logs, wet cardboard, leaf litter, etc).

Impacts on Wildlife Movement Corridors

The general discussion of corridors and connectivity by the applicant is not particularly informative about this specific property. Referring to the habitat as "fragmented and degraded," while true from a botanical perspective, downplays the site's value to gnatcatchers, as evidenced by the presence of between four and six nesting territories. This appears to represent one of the largest concentrations within the City of Escondido, and should be evaluated as such in combination with considering the potential value of the SPA as a 'stepping-stone' corridor or linkage for California gnatcatchers and possibly other coastal sage scrub bird species. Stepping stone preserves are of much greater value if they are of sufficient size to support one or more pairs of breeding gnatcatchers. This issue has recently come up on other sites in the immediate Escondido vicinity (along I-15, at Jesmond Dene, etc). Elsewhere in the MHCP, the City of Oceanside has had to make significant use of such a stepping-stone

connection to link with preserved areas in Carlsbad. Staff requests that Palomar present a more in-depth discussion of stepping-stone corridors/linkages and their value with respect to California gnatcatchers in the SPA. If there is a more direct connection (particularly north-south) or a better stepping-stone linkage candidate area, this should be pointed out. Otherwise, the loss of this site might pose a significant reduction to an already compromised north-south link.

Habitat Compensation for Direct Impacts of ERTC Industrial Park Development

The ERTC proposes acquisition of compensation lands within the Subarea Plan Focused Planning Areas (FPAs), in habitat that has been identified by the MHCP within the unincorporated San Diego County core area, or in other areas approved by the City, State, and Federal jurisdictional agencies. All mitigation land for sensitive species (i.e. coastal sage scrub and aquatic spadefoot toad habitat) will be acquired as contiguous blocks in areas that currently support these species, as conservation of an equal number of individuals is also a mitigation condition required under the Subarea Plan. Staff has reviewed the Draft EIR for the ERTC (City of Escondido, 2002a) and recommends that the final environmental document for the ERTC includes a discussion of specific locations proposed as mitigation and include the condition that the applicant will coordinate with the Wildlife Agencies and the City of Escondido on the selection of mitigation sites. Final selection must be approved by the both the Wildlife Agencies and the City.

Similarly, impacts of the proposed water pipeline on habitats not requiring mitigation should be discussed in the final environmental document for the ERTC.

CONCLUSIONS

If the unresolved issues stated above are adequately addressed and the mitigation proposed for construction impacts of the ERTC and operation of the power plant are implemented, staff believes that: (1) the PEP can comply with the various Biological Resources laws, ordinances, regulations, and standards; and (2) impacts of the PEP on biological resources will be mitigated to a less-than-significant level.

RECOMMENDATIONS

To make certain that the PEP is in compliance with all laws, ordinances, regulations, and standards during project construction and operation, staff recommends that the Energy Commission also adopt the following Biological Resources Conditions of Certification.

CONDITIONS OF CERTIFICATION

The following Biological Resources Conditions of Certification are proposed by staff.

Applicant-Proposed Habitat Compensation Mitigation

BIO-1 The project owner will implement the following habitat compensation strategy for permanent and temporary biological resource impacts of the Escondido Research and Technology Center (ERTC), consistent with the Subarea plan:

1. Required habitat-based mitigation for Planning Area 1 impacts (identified in Table 5) follows the proposed standards set forth in the draft Escondido Subarea Plan.

   Mitigation requires a 2:1 habitat compensation ratio for California gnatcatcher-occupied sage scrub acreage and conservation of an equal number of California gnatcatchers within a preserve system. This acquisition will occur within the Subarea Plan Focused Planning Areas (FPAs), in occupied California gnatcatcher habitat that has been identified by the MHCP within the unincorporated San Diego County core area, or in other areas approved by the City, State, and Federal jurisdictional agencies.

   Mitigation for coastal sage scrub habitat will adhere to the acreage requirements cited in Table 5. These mitigation requirements will also be fulfilled within the FPAs, in habitat that has been identified by the MHCP within the unincorporated San Diego County core area, or in other areas approved by the City, State, and Federal jurisdictional agencies. Mitigation shall be in place to the satisfaction of the CPM and City's Planning Director prior to issuance of a grading permit.

2. Direct impacts to California gnatcatchers would be adequately addressed through habitat conservation that also supports an equivalent number of gnatcatchers.

3. Western spadefoot toad impacts and seasonal basin areas would be mitigated through creation or restoration of an equivalent acreage of habitat that supports seasonal ponds in preserve lands within the MHCP FPAs. This mitigation plan shall be submitted to the CPM and City's Planning Director for approval prior to issuance of any grading permit.

4. For off-site improvements (i.e., Vineyard Avenue and Valley Parkway), when project-specific engineering has been completed, the City shall ascertain the acreage of impacts and implement mitigation in accordance with the ratios above and implement the same mitigation measures as previously indicated.

Verification: No less than 60 days prior to site (Planning Area 1) mobilization, the project owner will provide written verification to the CPM that the above-mentioned habitat compensation has been implemented to the satisfaction of the state and federal resource agencies.

Designated Biologist Selection

BIO-2 The project owner shall submit the resume, including contact information, of the proposed Designated Biologist to the CPM for approval.

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

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;

2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;

3. At least one year of field experience with biological resources found in or near the project area; and

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

Designated Biologist Duties

BIO-3 The Designated Biologist shall perform the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities:

1. Advise the project owner's Construction/Operation Manager, supervising construction and operations engineer on the implementation of the biological resources Conditions of Certification;

2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species or their habitat;

3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

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

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

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

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

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

Designated Biologist Authority

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

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

The Designated Biologist shall:

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

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

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

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

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that

coordination with other agencies will require additional time before a determination can be made.

Worker Environmental Awareness Program

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

The WEAP must:

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

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

3. Present the reasons for protecting these resources;

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

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

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

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

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

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

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

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

Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)

BIO-6 The project owner shall submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG, ACOE and USFWS (for review and comment) and shall implement the measures identified in the approved BRMIMP.

The final BRMIMP shall identify:

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

2. All biological resources Conditions of Certification identified in the Commission's Final Decision;

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

4. All biological resources mitigation, monitoring and compliance measures required in other state agency terms and conditions, such as those provided in the CDFG Incidental Take Permit and Streambed Alteration Agreement and Regional Water Quality Control Board permits for the ERTC;

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

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

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

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

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

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

11. A copy of the following documents obtained for the ERTC:

    (a) Final ERTC EIR adopted by the City of Escondido;

    (b) Final Escondido Subarea Plan implementing the MHCP;

(c) USFWS Biological Opinion;

(d) CDFG Consistency Determination;

(e) CDFG Streambed Alteration Agreement;

(f) ACOE 404 Permit; and

(g) RWQCB 401 Water Quality Certification.

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

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

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

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

Within thirty (30) days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

Closure Plan Measures

BIO-7 The project owner will incorporate into the permanent or unexpected permanent closure plan, measures that address the local biological resources.

The planned permanent or unexpected permanent closure plan will address the following biological resources related mitigation measures;

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

b. Removal of all power plant site facilities and related facilities;

c. Measures to restore wildlife habitat, as appropriate, to promote the re-establishment of native plant and wildlife species; and

d. Revegetation of the plant site and other disturbed areas, as appropriate, utilizing appropriate seed mixtures and plantings.

Verification: At least twelve months prior to commencement of closure activities, the project owner shall address all biological resources related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan and include a

complete discussion of the local biological resources and proposed facility closure mitigation measures.

Construction Mitigation Management to Avoid Harassment or Harm

BIO-8 The project owner shall manage their construction site, and related facilities, in a manner to avoid or minimizes impacts to the local biological resources. At a minimum, measures include the following:

1. Initiate construction activities during the non-breeding season for California gnatcatchers (August 30 through February 14). Work completed during this period includes site boundary demarcation with construction fencing along the edge of retained coastal sage scrub, and all clearing and grubbing. This mitigation shall be placed as a condition on the Tentative Map and Grading Permit.

2. In the event that any nighttime construction is allowed, initiate night construction activities prior to the onset of the California gnatcatcher breeding season (prior to February 15). Alternatively, prior to conducting any night construction activities, a qualified biologist will determine that no California gnatcatcher breeding is occurring within 300 feet of areas that would be lighted. In the event that California gnatcatchers are found in proximity to areas to be lighted, a verification of adequate light shielding will be made by a qualified biologist prior to commencing night work. This mitigation shall be placed as a condition on the Tentative Map and Grading Permit.

   Shield all facility lighting such that no direct lighting falls within the adjacent natural habitat. Install adequate directional lighting or shielding to control nighttime illumination at the industrial park in a manner that does not enhance light levels within adjacent native habitat areas. This mitigation shall be placed as a condition on the Specific Plan and Conditional Use Permit.

3. Temporarily fence and provide wildlife escape ramps for construction areas that contain steep walled holes or trenches if outside of an approved, permanent exclusionary fence. The temporary fence will be hardware cloth or similar materials that are approved by USFWS and CDFG;

4. Make certain all food-related trash is disposed of in closed containers and removed at least once a week. Feeding of wildlife shall be prohibited;

5. Prohibit non-security related firearms or weapons from being brought to the site;

6. Prohibit pets from being brought to the site; and

7. Report all inadvertent deaths of sensitive species to the appropriate project representative. Injured animals will be reported to CDFG and the project owner will follow instructions that are provided by CDFG.

Verification: All mitigation measures and their implementation methods will be included in the BRMIMP.

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CULTURAL RESOURCES

Roger Mason

INTRODUCTION

The cultural resources section identifies potential impacts of the proposed Palomar Energy Project regarding cultural resources. The term cultural resources, as defined in law, include buildings, sites, structures, objects, and historic districts. The primary purpose of the cultural resources analysis is to ensure that all potential impacts are identified, and that conditions of certification are set forth that ensure impacts are mitigated below a level of significance under the California Environmental Quality Act (CEQA).

Staff provides a cultural resources overview of the project, as well as an analysis based on CEQA criteria that assesses potential project related impacts. If cultural resources are identified, staff determines whether the project may affect any identified resources and if the resources are eligible for the California Register of Historic Resources (CRHR) or the National Register of Historic Places (NRHP). If eligible, staff recommends mitigation that ensures no significant impacts will occur and that will reduce impacts to the cultural resource to a less than significant level. In addition, a project may impact a previously unidentified resource or impact an identified historical resource in an unanticipated manner. Staff therefore recommends procedures in the conditions of certification that mitigate these potential impacts.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

- Federal Guidelines for Historic Preservation Projects, 36 C.F.R. § 61: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The 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.
- Code of Federal Regulations, 36 CFR Part 800 et seq., the implementing regulations of Section 106 of the National Historic Preservation Act of 1966, as amended (16 U. S. C. § 470): This act expresses the general policy of the federal government that supports and encourages the preservation of prehistoric and historic resources for present and future generations. It established the National Register of Historic Places, the President's Advisory Council on Historic Preservation, procedures for actions taken by federal agencies that may affect historic resources, and a fund for preservation. Pertinent to this project, section 106 of this act requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning.

STATE

- California Code of Regulations, (Title 14, §15000 et seq.) section 4852 defines the term "cultural resource" to include buildings, sites, structures, objects, and historic districts.
- Public Resources Code, section 5000 establishes a California Register of Historic Places (CRHR), criteria for eligibility to the CRHR and defines eligible resources. It identifies any unauthorized removal or destruction of historic resources on sites located on public land as a misdemeanor. It also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and establishes the penalty for possession of such artifacts with intent to sell or vandalize them as a felony. This section defines procedures for the notification of discovery of Native American artifacts or remains, and states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.
- The California Environmental Quality Act (CEQA) (Pub. Resources Code, §21000 et seq.); Cal Code Regs requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code, section 21083.2 states that the lead agency determines whether a project may have a significant effect on “unique” archaeological resources. If so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation, limits the applicant’s cost of mitigation, sets time frames for excavation, defines “unique and non-unique archaeological resources,” and provides for mitigation of unexpected resources. The California Energy Commission process is a CEQA equivalent process and Staff Assessments replace the CEQA environmental documents.
- Public Resources Code, section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource. The section further defines a “historic resource” and describes what constitutes a “significant” historic resource.
- The CEQA Guidelines, (Cal. Code Reg, Tit.14, § 15126.4(b)) prescribe the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project’s impact on a historical resource. The Guidelines also discuss documentation as a mitigation measure and discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- Section 15064.5 of the CEQA Guidelines defines the term “historical resources,” explains when a project may have a significant effect on historic resources, describes CEQA’s applicability to archaeological sites, and specifies the relationship between “historical resources” and “unique archaeological resources.”

- Penal Code, section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- Health and Safety Code, section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.

LOCAL

City of Escondido

The City of Escondido General Plan Policies F1.1 through F1.5 promote the preservation of cultural resources. Article 40 of the City of Escondido Zoning Ordinance establishes a local register of historical places and a Historical Resources Commission. An historical survey of the city was completed in 1984 and is updated periodically. The survey resulted in an historical inventory of the city. Structures in the inventory can be considered for local register, local landmark or historic district status if they meet certain criteria and are approved by the Historical Resources Commission and the city council. Demolition permits for buildings listed in the local register (which includes local landmarks and historic districts) are granted by the Historical Resources Commission and the city council only if certain conditions are met (Palomar 2001a, AFC p. 6-34; Palomar 2001b, Data Response 36).

ENVIRONMENTAL SETTING

The proposed project site (20 acres) and associated linear routes for natural gas and reclaimed water are located in the City of Escondido in northern San Diego County. The project area is in an industrial commercial area in Escondido and is within the Escondido Research and Technology Center specific plan area (208 acres). The project area is at an elevation of about 650 feet on the relatively level floor of a valley drained by Escondido Creek. The project site is about 0.6 mile northwest of Escondido Creek. The reclaimed water line route extends to Escondido Creek. The valley is bounded to the west by hills that lead up to Mount Whitney (1650 feet) on the north by the Merriam Mountains. The area is underlain by granite bedrock and there are granite outcrops on the surface. These outcrops were sometimes used as bedrock milling surfaces by the prehistoric inhabitants of the area.

The proposed power plant would be constructed on a 20-acre portion of a proposed186-acre industrial park. Preparation of land (grading and filling) for the entire industrial park and a portion of the projects reclaimed water and wastewater lines would be accomplished prior to any site preparation associated specifically with the power plant (Palomar 2001a, AFC p.5.16-1). Due to the interconnectedness of the industrial park and the proposed power plant, Energy Commission staff is providing comments on the Environmental Impact Report prepared by the City of Escondido.

The Energy Commission and the City of Escondido have entered into a Memorandum of Understanding (MOU) to coordinate the environmental reviews of the Palomar Energy Project (PEP) and the Escondido Research and Technology Center (ERTC) Specific Plans. The ERTC Specific Plan includes modifications that enable the PEP to comply with all laws, ordinances, regulations, and standards (LORS). Approval of the

PEP can not occur until the City completes its environmental review process and approves the ERTC specific plan.

The ERTC would be constructed on land that consists of a central graded area. To the north of the graded area is a largely cleared slope that was formerly avocado and citrus grove and to the south are naturally vegetated slopes. The site is boarded on the north by a vacant lot where a 49 MW gas-fired combustion turbine plant is planned. To the East there is an existing industrial park. The land use to the west is semi-rural residential use. To the south, the land use is designated for large-lot residential use (Palomar 2001a, AFC p. 5.7-8 through 5.7-9).

Refer to the **PROJECT DESCRIPTION** section of this Preliminary Staff Assessment for additional information and maps of the project development region and the project area.

PREHISTORIC SETTING

San Diego County prehistory is divided chronologically into the San Dieguito Complex (10,000 to 8,000 years before present [BP]), the La Jolla Complex and Pauma Complex (both 8,000 to 3,000 BP), and the Late Period (1,300 to 200 BP).

The San Dieguito complex was originally thought to represent Early Holocene (10,000 to 8,000 BP) big game hunters who moved to the San Diego county coastal area from the Great Basin when warmer drier conditions at the end of the Pleistocene resulted in desiccation of the pluvial lakes in the Great Basin (Warren 1967). Because large projectile points were found at the Harris site (SDI-149), a San Dieguito site on the San Dieguito River, it was thought that big game hunting continued after these people arrived on the coast during the Early Holocene (Ezell 1987). However, more recent investigations at other sites dating to the Early Holocene closer to the coast, such as SDI-10, 965 (Gallegos 1991) and SDI-9649 (Koerper, et al.1991), showed that a wide range of plant foods, along with small and medium size terrestrial mammals, fish, and shellfish, were being exploited in these sites during the Early Holocene. Population size was likely low with relatively little competition for resources. Therefore, small groups probably moved throughout the coastal area and the Peninsular Ranges to wherever the best resources were available at the time, although they may not have moved very far or often.

The La Jolla complex represents the material remains of people who occupied the San Diego County coast during the Middle Holocene between about 8,000 and 3,000 BP. Most La Jolla complex sites are located around the coastal lagoons which began filling with sea water at the beginning of this period because of sea level rise as the ice caps melted at the end of the last ice age. Shellfish from these lagoons were an important part of the diet. La Jolla Complex sites contain fire-affected rock features (probably hearths). Most flaked stone tools are core-cobble tools and ground stone tools, such as manos and metates, are abundant. Projectile points (dart points) are present, the most characteristic type being Elko-Eared.

The Pauma Complex is found at inland sites at the same time as the La Jolla Complex and is very similar to the La Jolla Complex, although coastal subsistence remains, such as fish and shellfish, are absent. The Escondido area could have been occupied by

people with a Pauma Complex culture during the Middle Holocene. The Pauma complex may represent the inland part of a seasonal round of some of the same groups that occupied sites near the coast during other seasons of the year. Alternatively, the La Jolla and Pauma complexes may represent separate coastal and inland groups that shared similar technology and subsistence adaptations, although the Pauma complex would have lacked direct access to coastal resources. The most common Pauma complex artifacts are manos (usually bifacial and shaped by pecking). Other artifacts include oval basin metates, scrapers, scraper planes, hammers, hammer-grinders, and bifaces (projectile points and knives) (True 1980). Bifaces are not common on Pauma complex sites, however. Discoidals and stone balls, which appear to be non-utilitarian artifacts, are rare. Pauma complex sites in northern San Diego County are located on old Pleistocene soils on mudflows and terraces. Pauma sites have no midden or anthrosol (culturally modified soil) and the artifacts are on the surface or come from relatively shallow depths (True 1980). These sites appear to represent temporary camps for seed collection and processing. It is likely that larger residential bases also existed, probably in river and stream valleys, but these may have been buried by later alluvial deposits.

There are few sites that date to the period from 3,000 to 1,300 BP in northern San Diego County. The coastal lagoons silted in, reducing or eliminating shellfish yields. However, few inland sites date to this period, as well. Little is known about settlement and subsistence during this period of San Diego County prehistory.

The Late Period from 1,300 to 100 years BP is characterized by a larger population, a more sedentary settlement system, and a more intensive use of available resources. The large villages occupied almost year-round seen by the Spanish in AD 1769 developed during this period. Acorns were added to the diet, as indicated by the presence of bedrock mortars at inland processing sites and residential sites. Acorns require a great deal of labor to process and were added to the diet relatively late in prehistory when increasing numbers of people required additional sources of calories. Ceramics and obsidian from the Obsidian Butte source at the south of end of Lake Cahuilla (now the Salton Sea) also appeared toward the end of the Late Period. The Late Period is also characterized by use of the bow and arrow, rather than spear-thrower and dart, which had been used previously.

In northern San Diego County the Late Period is represented by the San Luis Rey complex. Village sites have bedrock mortars, pestles, manos, metates, triangular arrow points, bone awls and shell artifacts. The San Luis Rey culture has been divided into two phases, San Luis Rey I (SLR I) and San Luis Rey II (SLR II) (True, et al. 1974). SLR II is distinguished from SLR I by the addition of pottery vessels, pictographs, and cremation of the dead. After European contact, non-native artifacts, such as glass beads and metal knives, appear. SLR I is thought to extend from A.D. 1400 (about 550 B.P.) to A.D 1750. It may, however, have begun earlier. SLR II (A.D. 1750 to 1850) was quite brief and falls mostly within the historic period which began with the overland arrival of the Spanish in AD 1769. In southern San Diego County the Late Period is represented by the Cuyamaca complex which is characterized by Desert Side Notched and Cottonwood arrow points, cobble based scrapers, choppers, and hammerstones, bone awls, manos and metates, mortars and pestles, Tizon Brownware pottery, and

steatite items, such as arrowshaft straighteners, comales (flat heating stones), and pendants (True 1970).

ETHNOGRAPHIC BACKGROUND

The project area is located along the southern boundary of the territory occupied by the Luiseño who spoke a language that was part of the Takic branch of the Uto-Aztecan language stock. The term Luiseño is derived from Native Americans who were living in the area served by Mission San Luis Rey. The Kumeyaay occupied the territory south of the Luiseño and spoke a language that was part of the Yuman family of the Hokan language stock. Other than language, the Luiseño and Kumeyaay were culturally similar.

The Luiseño lived in sedentary and autonomous village groups, each with specific subsistence territories encompassing hunting, collecting, and fishing areas. Villages were typically located in valley bottoms, along streams, or along coastal strands near mountain ranges where water was available and village defense was possible. Inland populations had access to fishing and gathering sites on the coast, which they used during the winter months (Bean and Shipek; 1978, pp.5502-551).

Luiseño subsistence was centered around the hunting of small animals such as deer, rabbit, and ground squirrels, and the seasonal gathering of acorns and seeds. Tool technology for food acquisition, storage, and preparation reflects the size and quantity of items procured. Hunting was done both individually and by community organized groups. Small game was hunted with the use of curved throwing sticks, nets, slings, or traps. Bows and arrows were used for hunting and warfare. Dugout canoes, basketry fish traps, and shell hooks were used for near shore ocean fishing. Coiled and twined baskets were made for food gathering, preparation, storing, and serving. Other items used for food processing included a large shallow tray for winnowing chaff from grain, ceramic and basketry storage containers, manos and metates for grinding seeds, and ceramic jars for cooking (Bean and Shipek 1978, pp. 552-3).

Villages had hereditary chiefs who controlled religious, economic, and territorial activities (Boscana 1933:43; cf. Bean and Shipek 1978:555). An advisory council of ritual specialists and shamans was consulted for environmental or ritual knowledge. Large villages located along the coast or in large inland valleys may have had more complex social and political structure than settlements controlling smaller territories (Strong 1929; cf. Bean and Shipek 1978, pp. 555).

The Luiseño cosmology centered around a dying-god motif and a creator-culture hero named *Wiyot* (Bean and Shipek 1978:557). *Wiyot* was a legendary religious leader who was the son of earth-mother *(tama yawut).* The ancestral people followed the leader in their migration from the north to their homeland. As the legend goes, when *Wiyot* was sick and dying, the people took him to a number of sacred hot springs to cure him. It was said that *Wiyot* died in California, at the Elsinore Hot Springs. Therefore, the Elsinore Hot Springs has religious significance to the Luiseño, as the locality known as *Itengvu Wumoumu* (DuBois 1908, p. 134; Harrington 1978, p.199).

HISTORIC SETTING

Spanish missionaries began their exploration of California and development of the missions in 1769, starting in San Diego and ending with the missions in San Rafael and Sonoma, in 1823. The closest mission to the project area was Mission San Luis Rey, established in 1798 on the San Luis Rey River in Luiseño territory. An asistencia (mission outpost) of the San Luis Rey Mission, known as San Antonio de Pala, was founded in Luiseño territory further up the San Luis Rey River near Mount Palomar in 1816.

After Mexico became independent from Spain in 1822, the missions were closed by the Mexican government in the early 1830s. Former mission lands were granted to soldiers and other Mexican citizens for use as cattle ranches. The El Rincon del Diablo land grant was just east of the project site and included most of the area now occupied by the City of Escondido. This rancho was granted to Juan Bautista Alvarado in 1843. Alvarado had been an official in the town governments of both Los Angeles and San Diego. He built and lived in an adobe house on his land grant until he died in 1850 (Palomar 2001a, AFC pp.5.16-10, 11).

California became part of the United States in 1848 as a result of the Treaty of Guadalupe Hidalgo, which ended the war between the United States and Mexico. One of the important battles of this war took place in San Pasqual Valley, located just outside of Escondido to the southeast, in 1846 (Pioneer Room 2002:3).

Alvarado's heirs sold the El Rincon del Diablo rancho to Oliver S. Witherby who had arrived in San Diego as part of the Mexican Boundary Commission in 1849. Witherby was appointed to the state legislature in 1850, and then was named a district judge. In 1853 he was appointed customs collector for the port of San Diego. Witherby lived on the rancho with his family and pursued cattle ranching and gold mining. A small amount of gold was found on the rancho in the early 1860s and a small gold rush ensued. Witherby sold the entire rancho and land grant to Edward McGeary and Matthew, John, and Josiah Wolfskill in 1868 (Palomar 2001a, AFC pp. 5.16-11). The Wolfskills used the rancho for sheep and later planted grapes and orange trees (Pioneer Room 2002:4).

In 1886 a group of investors from Los Angeles purchased the rancho and formed the Escondido Land and Town Company. Wells were drilled to provide water and a town was platted and incorporated in 1888. Railroad service to Escondido began in 1890 when a railroad spur was completed to the Santa Fe Railway main line in Oceanside (Palomar 2001a, AFC p. 5.16-12). The formation of the town of Escondido was part of the "Boom of the Eighties" (Dumke 1944), a period of rapid economic expansion and town formation that resulted from a major in-migration of population to southern California made possible by cheap railroad transportation. The low fares were a result of the rate wars between the two competing transcontinental railroads, the Southern Pacific and the Santa Fe.

Escondido became a supply center for ranches and farms in the area. Completion of Bear Valley Dam on Escondido Creek northeast of Escondido in 1895 assured a water supply for irrigation agriculture, especially for grape cultivation (Pioneer Room 2002:5). During Prohibition, many of the grape fields were converted to citrus and avocado

groves. Escondido experienced a major period of growth after 1950 and today much of the valley is covered by urban development.

RESOURCES INVENTORY

Literature and Records Search

The records search and literature review for the Palomar Energy Project site and linear route were performed as part of the environmental studies for the 208 acre Escondido Research and Technology Center Specific Plan Area (Palomar 2001a1, p.1). The records search was conducted at the South Coastal Information Center (SCIC) of the California Historic Resources Information System (CHRIS) located at the San Diego State University, and at the San Diego Museum of Man. The records searches included an area within a mile radius of the energy project site and areas within one half mile of the reclaimed water line route and the gas line route (Palomar 2002a, AFC 5.16-22). Twenty-eight sites or structures and two isolated artifacts have been previously recorded within this area. There are 18 prehistoric archaeological sites, two historic archaeological sites, two archaeological sites with both prehistoric and historic components, and six historic structures or facilities, including a well. The prehistoric sites are mostly lithic scatters and/or bedrock milling features. Two of the sites have prehistoric rock art, as well as lithics and bedrock milling features.

Thirty structures of historic age were previously identified within one mile of the project area as a result of a historic resources survey performed in 1983 (Palomar 2002b, pp. 9-10). Of these 30, three are the same as three of the six historic structures recorded at the SCIC, and six are listed in the City of Escondido's Historic Resources Inventory. Three of the thirty structures are located within 100 feet of the proposed gas line route. These three structures (1070, 1100, and 1110 West Mission Avenue) are not listed in the City of Escondido's Historic Resources Inventory. None of the 30 structures are within 2000 feet of the energy project site.

Six buildings listed in the City of Escondido's Historic Resources Inventory are located within one mile of the Palomar Energy Project site (Palomar 2002b: Data Response 35). However, all are at least 3,000 feet from the Palomar Energy Project site and are at least 1200 feet from the project linear routes.

Letters were sent to the Escondido Historical Society and the California Historical Society requesting information about historical resources in the project area, but no responses were received (Palomar 2002b: Data Response 38).

Field Surveys

The field surveys for archaeology and historic architecture for the Palomar Energy Project site and linear route were performed as part of the environmental studies for the 208-acre Escondido Research and Technology Center Specific Plan Area (SPA) (Palomar 2001a1; Palomar 2002b). While the archaeological survey covered the entire 208-acre SPA, the historic architecture survey covered only the structures directly adjacent to the 20 acre energy project site and the water and gas line routes. The archaeological survey of the power plant property was performed by walking parallel 10 meter transects. The proposed reclaimed water line route was also surveyed (Palomar

2001a, AFC p. 5,16-13). The surveyors noted that dense vegetation obscured the ground surface in some parts of the survey area.

Although five new archaeological sites were recorded in the186-acre ERTC (Planning areas 1-8), no previously recorded or new archaeological resources were identified as a result of the survey of the 20 acre energy project site, nor along the proposed reclaimed water line route (Palomar 2001a, AFC p. p. 5.16-13). The surveyors noted the potential for buried prehistoric archaeological sites along the proposed reclaimed water line route in the vicinity of Escondido Creek (Palomar 2001a, AFC p. 5.16-13).

At the request of staff, a field reconnaissance was performed to determine the status of 13 previously recorded resources that appeared to be near the energy project site or the linear routes. It was determined that only four of the 13 sites still exist. Locus A of CA-SDI-5210 consists of bedrock milling features and associated lithic debitage. It is 12 meters from the gas line route, but protected. Locus B of CA-SDI-5210 consists of bedrock milling features and is located over 100 meters from the gas line route. CA-SDI-5505B consists of fire-affected rock features and associated artifacts. It is contained within a landscaped area of an industrial complex. CA-SDI-12,209/H consists of bedrock milling features with rock art and historic refuse. CA-SDI-5501 consists of bedrock milling features and is located in the vicinity of the reclaimed water line route (Palomar 2002d, Data Response 124).

The field survey for historic architecture was performed by a historical archaeologist to reassess the three previously recorded structures within 100 feet of the gas line route and to identify any previously unrecorded historic structures adjacent to the 20 acre energy project site or along the gas and water line routes.

The field survey showed that two of the three previously recorded structures within 100 feet of the gas line route had been demolished. As a result of the field survey seven additional structures that appeared to be more than 45 years old were identified adjacent to the energy project site or within 100 feet of the gas line route (Palomar 2002c, p. 11). The eight identified properties are listed in Table 1. Although the applicant did not supply dates of construction, construction dates were obtained from an on-line real estate database service, where possible.

Cultural Resources Table 1. Historical Structures Identified Near PEP

Address	Description	Date of Construction	Appears Eligible	Near
1002 Metcalf Street	Single Family Residence	1956*	No	Gas Line
1072 W. Lincoln Avenue	Single Family Residence	1955*	No	Gas Line
1060 W. Lincoln Avenue	Single Family Residence	1960*	No	Gas Line
1009/1015 W. Lincoln Avenue	Multi-Family Dwelling (2 Structures)	1950s est.	No	Gas Line
917 W. Lincoln Avenue	Single Family Residence	1924*	No	Gas Line
1070 W. Mission Avenue	Industrial Facility	1930s est.	Yes	Gas Line
2310 Harmony Grove Road	Poultry (2 Units)*	Unk.*	N/A	Project Site
2530 Kauana Loa Way	Single Family Residence	1934*	N/A	Project Site
* from DataQuick Information Systems				

The two properties near the energy project site, 2310 Harmony Grove Road and 2530 Kauana Loa Way, were not inventoried or evaluated because they could not be seen from the road. They are both located at the end of a long private drive and are screened by dense vegetation. They are at least 60 years old because they appear on a 1942 edition of a USGS quad map (Palomar 2002c, p. 11). The real estate data base service provided a construction date of 1934 for one of the properties, but did not provide a date for the other, which is listed as having two “units” used for poultry. Both properties are located on a hill about 1,500 feet southwest of the energy project site.

Two sets of transmission lines supported by metal lattice towers and five sets of transmission lines supported by wooden poles were observed crossing the energy project site. However, none of these linear features are old enough to constitute a potential historical resource. A representative of San Diego Gas and Electric Company stated that the metal lattice towers were installed in 1959 and 1973. Two of the transmission lines supported by wooden poles were installed in 1959. Another was installed in 1962. The other two were built in the 1980s and 1990s (Palomar 2002c, p.17).

The age of a radio tower located several hundred feet north of the energy project site could not be factually determined, but it does not appear to be more than 45 years old or exceptional (Palomar 2002c, p.17). After extensive research, the applicant was not able to determine the age of the radio tower. However, nothing in the history of the area indicates that it might be eligible to the CRHR (Palomar 2002e, p.1). The Hale Avenue Resource Recovery Facility, a sewage treatment plant located about 4,000 feet south of the energy project site and 1,000 feet south of the reclaimed water line route, was originally built in 1959 and was expanded in the 1970s and 1990s. It is not yet 45 years old, does not apppear exceptional, and therefore does not qualify as a potential historical resource (Palomar 2002c, p.17).

Native American Contacts

The applicant contacted the Native American Heritage Commission (NAHC) to obtain a list of Native Americans to be contacted for the project area. The NAHC provided names of contacts for San Diego County. The applicant sent letters to 25 individuals which described the project and asked about concerns. Although four responses were received, all responses were about an archaeological site that contains rock art located south of the project area and which will not be affected by the Palomar Energy Project. The NAHC also searched its sacred lands file and found no listings for the project area (Palomar 2001a, AFC p.5.16-13).

An additional list of concerned Native Americans in San Diego County who have requested to be informed regarding construction disturbances in their area was provided to the Energy Commission by the NAHC. On May 15, 2002, the Energy Commission also sent contact letters to individuals and groups who had been listed. This mailing provided the information that any comments regarding the project could be directed to the Energy Commission as well as the applicant.

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet several sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the cultural resources and the methods and consultation required to mitigate any such impacts.

The record and literature search, and the pedestrian surveys of the proposed project area and linears, were conducted to identify the presence of any cultural resource sites or materials. Where resources were identified, an evaluation was conducted to determine whether the resources were already listed on, or were potentially eligible for listing on, either the National Register of Historic Places (NRHP) or the CRHR. The determination of eligibility is made in compliance with the criteria for the CRHR (CCR Section 4852). A resource is eligible for listing if it: (1) Is associated with events that have made a significant contribution to the broad patterns of local, regional, state or national history; (2) Is associated with the lives of persons important in local, state or national history; (3) Embodies distinctive characteristics of a type, period, region or method of construction, or represents the work of a master or possesses high artistic values; or (4) Has yielded or may yield important information in history or prehistory (Cal. Code Regs., tit. 14, §15064.5).

Cultural resources that meet the eligibility criteria for the CRHR are “historical resources.” The CEQA Guidelines explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect “historical resources.” The guidelines provide a definition for historical resources and set forth a listing of criteria for making this determination. These criteria are the eligibility criteria for the CRHR and are essentially the same as the eligibility criteria for the NRHP. In addition, as with the NRHP, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Resources eligible for the CRHR may have less integrity than the resources eligible for the NRHP. If the criteria are met and the resource is determined eligible for the CRHR, the Energy Commission must evaluate whether the project would cause a “substantial adverse change in the significance of the historical resource,” which the CEQA Guidelines define as a significant effect on the environment. If there is federal involvement in the project, the lead federal agency will ensure compliance with section 106 of the National Historic Preservation Act. The lead Federal agency will also determine the eligibility of applicable sites for the NRHP in consultation with the State Historic Preservation Officer (SHPO).

CEQA also addresses “unique” archeological resources and provides a definition of such resources (Pub. Resources Code, § 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the limitations in this section do not apply when an archeological resource has already met the definition of a historical resource (Cal. Code Reg., tit. 14, §15064.5). Most archaeological sites qualify as historical resources under criterion (4), as listed above. Where staff has determined that the sites for which it is recommending mitigation meet

the definition of historical resources, the prohibition does not apply to the mitigation discussed in this staff assessment.

Energy Commission staff make recommendations regarding known resources located within or adjacent to the project footprint regarding whether they meet the eligibility criteria of the CRHR. If an impact is anticipated, staff recommends mitigation measures for historical resources.

The applicant has identified six properties that are more than 45 years old and are within 100 feet of the gas line route (Palomar 2002b, p. 2-3). Five of the six properties were evaluated as not eligible for the California Register of Historical Resources (CRHR) by the applicant, because of a lack of integrity. Four of the five buildings have been substantially altered and the other (917 Lincoln Avenue) lacks integrity of setting because of the construction of Highway 78 directly adjacent to its backyard (Palomar 2002b, p.4). The sixth property, the Escondido Cement Products facility at 1070 West Mission Avenue was evaluated as eligible for the CRHR. The principal structure is a Quonset hut style building constructed in the 1930s. This property was evaluated as significant in an earlier study and was evaluated as eligible for the CRHR by the original recorder and the applicant concurred (Palomar 2002b, p.14). However, the applicant does not state under which CRHR criteria the property is eligible nor why it is eligible. Consequently, staff believes more information is necessary before the CRHR eligibility of this property can be determined. To adequately evaluate this property, its eligiblity to the register would need to be determined according to each of the criteria provided in CEQA. Insisting on a thorough evaluation does not seem necessary because it does not appear the property will be impacted by the project.

The applicant also identified two properties that are more than 45 years old and are on a hill overlooking the energy project site. However, because the structures on these properties could not be seen from the road, they were not recorded or evaluated. The setting of these properties has already been affected by an existing industrial development and will be separated from the proposed power plant by the ERTC permitted by the City of Escondido. Therefore, there will not be any significant impacts to these properties from the proposed power project.

The applicant identified 20 previously recorded archaeological sites within the project study area. Five additional sites and two isolates, all recommended as not significant by the applicant were identified within the ERTC footprint during the cultural resources survey. None of these potential cultural resources were identified within the proposed boundaries of the PEP. However, staff concludes that due to the presence of these sites in the vicinity of the project, some very near to the PEP footprint, caution is warranted during ground disturbance.

POTENTIAL IMPACTS

Since project development and construction usually entail surface and subsurface disturbance, the proposed PEP has the potential to adversely affect unknown cultural resources. Staff has analyzed the potential direct, indirect, and cumulative impacts from the proposed project. Direct impacts are those which may result from the immediate

disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation or demolition. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or vandalism due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources increases the potential for additional resources, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur.

The archaeological inventories for the energy project site and linear components did not identify any archaeological sites. Therefore, there are no known impacts to archaeological resources.

The two properties of historic age, located at 2310 Harmony Grove Road and 2530 Kauana Loa Way, have not been yet been evaluated. However, they will not be physically impacted by construction of the energy project, nor its associated linear facilities. Since the setting of these properties has already been affected by previous development and the properties will be separated from the power project by industrial property permitted by the City, it will not be necessary to evaluate them. Even if the properties had been evaluated as eligible to the CRHR, the aspects of their integrity would have already been compromised by an existing industrial facility.

The concrete block industrial facility at 1070 W. Mission Avenue located along the gas line route may be eligible for the CRHR, but more information is needed before a determination can be made. The gas line will be installed by trenching in city streets. Once installed, it will not be visible. Therefore, construction and operation of the gas line will have no significant physical impact on the property nor will it change the property's setting. It does not appear that the proposed power project will cause impacts to this property.

Although no archaeological sites have been previously identified within the direct impact area of the proposed power plant and linears, the presence of 20 previously recorded archaeological sites in the project vicinity and five archaeological sites within the planned ERTC area warrants caution during ground disturbance. The applicant proposes grading and filling the ERTC area, including the power plant site before work designated as specific to the power plant begins. Staff recommends both archaeological and Native American monitoring over the entire area while this work is completed. The applicant has stated that there is no subsurface component to any of the sites, however the applicant did indicate that it appears a subsurface component is possible at the site identified as S5. Presence/absence testing was not conducted at this site to determine if there was a subsurface component.

If an unexpected site is discovered, staff recommends recordation, evaluation and data recovery as appropriate. Any recovered artifacts should be appropriately curated.

CUMULATIVE IMPACTS

Portions of the land in the vicinity of the project are designated and have been developed as residential. However, most of the land surrounding the project has been subject to industrial development or is designated to be used for industrial development in the future. Mitigation measures such as recordation of potential historic resources and avoidance or excavation and data recovery of archaeological resources appears feasible. If these mitigation measures are conducted by all of the development projects, the potential cumulative impacts will be mitigated below a level of significance.

IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the Palomar Energy Project may be approximately 30 years. Upgrades or modifications may be made prior to the facility's closure that might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned orderly closure that will occur when the plant becomes economically non-competitive.

PLANNED CLOSURE

At the time of planned closure, all then-applicable LORS will be identified and the closure plan required by the Energy Commission will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are likely to depend upon the final location of project structures in relation to existing resources, and upon the procedures used for the removal of project structures. Since no impacts to cultural resources were identified, no impacts due to planned closure are expected. Should cultural resources be discovered the closure plan, when created, will address impacts to cultural resources.

TEMPORARY CLOSURE

A temporary closure should have no impacts on cultural resources as long as no additional lands are needed for the closure. A contingency plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

UNEXPECTED PERMANENT CLOSURE

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance previously unknown cultural resources might result.

COMPLIANCE WITH APPLICABLE LORS

Implementation of the mitigation measures recommended in the conditions of certification will ensure compliance with state and local LORS.

MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often, however, avoidance cannot be achieved or previously unknown cultural resources are encountered, and other measures such as surface collection, subsurface testing, and data recovery must be implemented for archaeological resources and documentation must be implemented for historical structures. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

APPLICANT'S PROPOSED MITIGATION

No mitigation measures for archaeological or historic resources were proposed by the applicant. However, the ERTC draft environmental impact report (EIR) from the City of Escondido proposes that if buried cultural materials or deposits are found during construction or related activities, work in the vicinity of the find will stop until the find can be assessed by a qualified archaeologist. If a find includes human remains, the county coroner will be notified immediately. If potentially significant cultural resources are discovered and avoidance is not possible, impacts must be mitigated through data recovery or other means, in consultation with pertinent agencies and concerned parties.

STAFF'S PROPOSED MITIGATION MEASURES

Because of the large number of previously recorded archaeological sites in the project area, Commission staff recommends monitoring by an archaeologist and Native American monitor during ground disturbing activities at the energy project site and during trenching for the reclaimed water line and the gas line. The recommended conditions of certification will ensure mitigation for potential impacts. In summary, **CUL-1** ensures that qualified specialists and monitors are obtained to conduct cultural resources activities at the project site. **CUL-2** provides the specialist with maps and drawings to enable timely planning and appropriate direction to cultural resources personnel. **CUL-3** requires preparation of a Cultural Resources Monitoring and Mitigation Plan (CRMMP) by the Cultural Resource Specialist (CRS). The CRMMP is a document that explains to staff how the CRS will comply with the conditions of certification. It is intended to be a working document that may be changed or amended as the project progresses.

Condition four, **(CUL-4)** requires the preparation of a cultural resources report (CRR) at the conclusion of the project. This document is intended to provide Energy Commission staff, the CHRIS, and the SHPO with a summary of cultural resources activities conducted as a result of the project. When archaeologists or historians obtain information from the CHRIS they sign an agreement that they will provide information in return. It is important to identify areas for the CHRIS where surveys or ground disturbance occurred and no cultural resources were found, as well as documenting discoveries.

Condition five, **(CUL-5)** provides for worker environmental training. The training serves to instruct workers that halting construction is necessary if a potential cultural resource is discovered. It also provides them with instruction regarding applicable laws, penalties

and reporting requirements in the event something is discovered. Workers are also instructed that the CRS and other cultural resources personnel have the authority to halt construction in the event of a discovery.

Condition six (**CUL-6**) ensures that cultural resources monitoring activities are conducted in a manner that will record cultural resources activities in a professional manner. Archaeological monitoring is recommended on this project because numerous archaeological sites in the vicinity of the project raise concerns regarding the potential for encountering sites within the PEP footprint or along the project linears. **CUL-6** also ensures that unanticipated impacts to cultural resources are identified and any incidences of non-compliance with the conditions of certification are recognized, reported and compliance ensured in a timely manner.

Condition seven (**CUL-7**) requires notification of staff within 24 hours of a cultural resources find. Timely notification enables staff participation in determinations of significance and the selection of appropriate mitigation to lessen impacts on cultural resources to a level that is less than significant.

CONCLUSIONS AND RECOMMENDATION

Although no known archaeological resources will be impacted by the Palomar Energy Project, the presence of numerous previously recorded and newly identified archaeological sites indicate there is a potential to impact buried prehistoric archaeological resources during ground disturbance. If the following conditions of certification are properly implemented, the project will comply with applicable laws, ordinances, regulations, and standards and impacts will be reduced below a significant level.

Staff recommends that the Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance, the project owner shall submit the resume of the proposed Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, to the CPM for review and approval. The CRS shall be responsible for implementation of all cultural resources conditions of certification and may obtain qualified cultural resource monitors (CRMs) to monitor as necessary on the project.
The resume for the CRS and alternate, shall include information that demonstrates that the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published by the CFR 36, CFR Part 61 are met. In addition, the CRS shall have the following qualifications:

a. The technical specialty of the CRS shall be appropriate to the needs of the project and shall include, a background in anthropology, archaeology, history, architectural history or a related field; and

b. At least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California.

The resume shall include the names and phone numbers of contacts familiar with the work of the CRS on referenced projects and demonstrate that the CRS has the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during ground disturbance, grading, construction and operation. In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed CRS or alternate has the appropriate training and background to effectively implement the conditions of certification.

CRMs shall meet the following qualifications:

a. A BS or BA degree in anthropology, archaeology, historic archaeology or a related field and one year experience monitoring in California; or
b. An AS or AA in anthropology, archaeology, historic archaeology or a related field and four years experience monitoring in California; or
c. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historic archaeology or a related field and two years of monitoring experience in California.

The project owner shall ensure that the CRS completes any monitoring, mitigation and curation activities necessary; fulfills all the requirements of these conditions of certification; ensures that the CRS obtains technical specialists, and CRMs, if needed; and that the CRS evaluates any cultural resources that are newly discovered or that may be affected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR).

Verification: The project owner shall submit the resume for the CRS at least 45 days prior to the start of ground disturbance. The resume of the alternate shall be submitted for review and approval, at least 10 days prior to the alternate beginning duties.

1. At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS.

2. At least 20 days prior to ground disturbance, the CRS shall submit written notification identifying any anticipated CRMs for the project stating they meet the minimum qualifications required by this condition. If additional CRMs are needed later, the CRS shall submit written notice one week prior to any new CRMs beginning work.

3. At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions of certification.

CUL-2

1. Prior to the start of ground disturbance, the project owner shall provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps will include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM.
2. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the CRS and the CPM for approval. Maps shall identify all areas of the project where ground disturbance is anticipated.
3. If construction of the project will proceed in phases, maps and drawings, not previously submitted, shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.
4. At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.
5. The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification: The project owner shall submit the subject maps and drawings at least 40 days prior to the start of ground disturbance.

1. If there are changes to any project related footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance for those changes.

2. If project construction is phased, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

3. A current schedule of anticipated project activity shall be provided to the CRS on a weekly basis during ground disturbance and also provided in each Monthly Compliance Report (MCR).

4. The project owner shall provide written notice of any changes to scheduling of construction phases within 5 days of identifying the changes.

CUL- 3 Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by the CRS, to the CPM for approval. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures.

1. A proposed general research design that includes a discussion of research questions and testable hypotheses applicable to the project area. A refined research design will be prepared for any resource where data recovery is required.
2. The following statement shall be added to the Introduction: Any discussion, summary, or paraphrasing of the conditions in the CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. If there appears to be a discrepancy between the conditions and the way in which they have been summarized described, or interpreted in the CRMMP, the conditions, as written in the Final Decision, supercede any interpretation of the Conditions in the CRMMP. (The Cultural Resources conditions of Certification are attached as an appendix to this CRMP).
3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.
4. Identification of the person(s) expected to perform each of the tasks, their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
5. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
6. A discussion of all avoidance measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The 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.
7. A discussion of the requirement that all cultural resources encountered will be recorded on a DPR form 523 and mapped (may include photos). In addition, all archaeological materials collected as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with The State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
8. A discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how

requirements, specifications and funding will be met. The name and phone number of the contact person at the institution. Indication the project owner pays all curation fees and that any agreements concerning curation will be retained and available for audit for the life of the project.

9. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.

10. A discussion of the proposed Cultural Resource Report (CRR) which shall be prepared according to Archaeological Resource Management Report (ARMR) Guidelines.

Verification: The project owner shall submit the subject CRMMP at least 30 days prior to the start of ground disturbance. Per ARMR Guidelines the author's name shall appear on the title page of the CRMMP. Ground disturbance activities may not commence until the CRMMP is approved. A letter shall be provided to the CPM indicating that the project owner will pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 The project owner shall submit the Cultural Resources Report (CRR) to the CPM for review and approval The CRR shall be written by the CRS and provided in ARMR format. The CRR shall report on all field activities including dates, times and locations, findings, samplings and analysis. All survey reports, DPR 523 forms and additional research reports not previously submitted to the California Historic Resource Information System (CHRIS) shall be included as an appendix to the CRR.

Verification: The project owner shall submit the subject CRR within 90 days after completion of ground disturbance (including landscaping). Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the State Historic Preservation Office (SHPO), the CHRIS and to the curating institution (if archaeological materials were collected).

CUL-5 Worker Environmental Awareness Program (WEAP) shall be provided, on a weekly basis, to all new employees starting prior to the beginning and for the duration of ground disturbance. The training may be presented in the form of a video. The training shall include:

1. a discussion of applicable laws and penalties under the law;

2. samples or visuals of artifacts that might be found in the project vicinity;

3. information that the CRS, alternate CRS or CRM has the authority to halt construction in the event of a discovery or unanticipated impact to a cultural resource;

4. instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the CRS or CRM;

5. an informational brochure that identifies reporting procedures in the event of a discovery;

6. an acknowledgement form signed by each worker indicating that they have received the training;

7. and a sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: The project owner shall provide the WEAP Certification of Compliance Report form in the Monthly Compliance Report identifying persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 1. The CRS, alternate CRS, or monitors shall monitor ground disturbance full time in the vicinity of the project site, linears and ground disturbance at laydown areas or other ancillary areas to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner. In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter or email providing a detailed justification for the decision to reduce the level of monitoring shall be provided to the CPM for review and approval prior to any reduction in monitoring.

2. CRMs shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

3. The CRS shall notify the project owner and the CPM, by telephone or e-mail, of any incidents of non-compliance with any cultural resources conditions of certification within 24hrs. of becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions of certification.

4. A Native American monitor shall be obtained, to monitor ground disturbance in areas where Native American artifacts may be discovered. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission.

Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored.

Verification: 1. During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval.

2. During the ground disturbance phases of the project, the project owner shall include in the MCR to the CPM copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained and made available for audit by the CPM.

3. Within 24 hours of recognition of a non-compliance issue, the CRS shall notify the CPM by telephone of the problem and of steps being taken to resolve the problem. The telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance with conditions of certification. In the event of a non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness or the resolution measures, shall be provided in the next MCR.

4. One week prior to ground disturbance in areas where there is a potential to discover Native American artifacts, the project owner shall send notification to the CPM identifying the person(s) retained to conduct Native American monitoring. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM who shall initiate a resolution process.

CUL-7 The CRS, alternate CRS and the CRMs shall have the authority to halt construction if previously unknown cultural resource sites or materials are encountered, or if known resources may be impacted in a previously unanticipated manner. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor.

In the event resources are found or impacts can be anticipated, the halting or redirection of construction shall remain in effect until all of the following have occurred:

1. the CRS has notified the project owner, and the CPM has been notified within 24 hours of the find description and the work stoppage.;
2. The CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
3. Any necessary data recovery and mitigation has been completed.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS, alternate CRS and CRMs have the authority to halt construction activities in the vicinity of a cultural resource find, and that the CRS or project owner shall notify the CPM immediately (no later than the

following morning of the incident or Monday morning in the case of a weekend) of any halt of construction activities, including the circumstance and proposed mitigation measures. The project owner shall provide the CRS with a copy of the letter granting the authority to halt construction.

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HAZARDOUS MATERIALS MANAGEMENT

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INTRODUCTION

The purpose of this Hazardous Materials Management analysis is to determine if the proposed Palomar Energy Project has the potential to cause significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. The **Worker Safety and Fire Protection** section of this document also describes the requirements applicable to the protection of workers from such risks.

Aqueous ammonia (19.5 percent ammonia in aqueous solution) is the only acutely hazardous material proposed to be stored at the Palomar Energy project in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j) (Palomar 2001a, Table 2.4-5). The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with use of the more economical anhydrous form of ammonia. Anhydrous ammonia is stored as a liquefied gas at elevated pressure, and results in high internal energy that can act as a driving force in an accidental release, which can rapidly introduce large quantities of the material to the ambient air and result in high down-wind concentrations. Because aqueous ammonia is stored at low pressure and is diluted with water, spills of aqueous ammonia are much easier to contain and are limited by the slow mass transfer from the surface of the spilled material.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, will be present at the proposed facility. Hazardous materials used during the construction phase include gasoline, diesel fuel, oil, welding gases, lubricants, solvents and paint. No acutely toxic hazardous materials will be used on-site during construction. None of these materials pose significant potential for off-site impacts as a result of the quantities on-site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will also involve the handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. San Diego Gas & Electric (SDG&E) owns an existing pipeline that is located immediately adjacent to the project site at the end of Enterprise Street (Palomar 2001a Section 2.4.5). Because of a local bottleneck in their pipeline, SDG&E will upgrade approximately 2,600 feet of pipeline at a location one-mile northeast of the site.

The Palomar Energy project will also require the transportation of aqueous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed below.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.), contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III). The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended) established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The CAA section on Risk Management Plans (42 USC §112(r)) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.

The safety requirements for pipeline construction vary according to the population density and land use that characterize the surrounding land. The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192.5):

- Class 1: Pipelines in locations with ten or fewer buildings within 220 yards from the center line in any one-mile stretch, that are intended for human occupancy.
- Class 2: Pipelines in locations with more than ten but fewer than 46 buildings within 220 yards from the centerline in any one-mile stretch, intended for human occupancy. This class also includes drainage ditches of public roads and railroad crossings.
- Class 3: Pipelines in locations with more than 46 buildings within 220 yards of the centerline in any one-mile stretch, intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12 month period. (The days and weeks need not be consecutive).

STATE

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

indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP).

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

Title 8, California Code of Regulations, Section 458 and Sections 500 to 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer ammonia. These sections generally codify the requirements of several industry codes, including the American Society for Material Engineering (ASME) Pressure Vessel Code, the American National Standards Institute (ANSI) K61.1 and the National Boiler and Pressure Vessel Inspection Code. These codes apply to anhydrous ammonia but are also used to design storage facilities for aqueous ammonia.

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

The natural gas pipeline will be designed for Class 3 service and will meet California Public Utilities Commission General Order 112-E and 58-A standards, as well as various SDG&E standards. The natural gas pipeline must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192:

- Title 49, Code of Federal Regulations, Part 190 outlines the pipeline safety program procedures;
- Title 49, Code of Federal Regulations, Part 191, Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days; and
- Title 49, Code of Federal Regulations, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifies minimum safety requirements for pipelines and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use which characterize the surrounding land. This part contains regulations governing pipeline construction that must be followed for Class 2 and Class 3 pipelines.

LOCAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials in Articles 79 and 80. The latest revision to Article 80 was in 1997

(Uniform Fire Code, 1997) and includes minimum setback requirements for outdoor storage of ammonia. The Administering Agency for this authority is the City of Escondido Fire Department.

The Certified Unified Program Authority (CUPA) with responsibility to review RMPs and Hazardous Materials Business Plans is the San Diego County Environmental Health Services Department. The CUPA has delegation for administering federal accidental release programs under SARA Title III.

SETTING

The proposed Palomar Energy Project would be located on a vacant 20-acre site within a planned 165-acre industrial park in the City of Escondido, California. The site is located west of Interstate 15 and south of Highway 78. It can be accessed from Highway 78 via Nordahl Road. Ultimately, access will be accomplished via two new paved roads connecting the site to the future Citracado Parkway. The site topography is sloped, with an elevation from 740 to 826 feet above sea level. The closest residences are approximately 1,800 feet west of the site. The closest schools are located approximately one mile southeast of the proposed Palomar site.

The PEP would be located on Planning Area 1 of the proposed Escondido Research and Technology Center (ERTC) project. The ERTC project and a draft Specific Plan for the ERTC are currently undergoing land use permitting and California Environmental Quality Act (CEQA) reviews, with the City of Escondido (City) as Lead Agency. The City released a draft Environmental Impact Report (EIR) on July 26, 2002. The City's Planning Commission and City Council are expected to consider a final EIR for the project in early October. A decision on the ERTC Specific Plan is expected in November.

The proposed project will be a combined-cycle electric generating facility consists of two natural gas-fired combustion turbine generators, two heat recovery steam generators, and a steam turbine generator, along with accompanying auxiliary systems and equipment. Natural gas-fuel will be supplied by an existing SDG&E pipeline running adjacent to the project site.

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

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the

potential magnitude and extent of public exposure to such materials, as well as the associated health risks. When wind speeds are low and the atmosphere is stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the Air Quality Section (Palomar 2001a, AFC Section 8.1) of the AFC. Staff agrees with the applicant that use of F stability (stagnated air, very little mixing) and 1.5 meter per second wind speed is appropriate for conducting the Offsite Consequence Analysis. Staff believes these conditions closely approximate worst case atmospheric conditions.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The terrain in the project site varies from 740 to 826 feet above sea level. Elevated terrain within a 10-mile radius exists mostly to the north and west of the proposed site (Palomar 2001a, AFC Figure 5.15-1). Potential for impacts of an accidental release would not extend to these areas.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. Figure 5.12-1 and Table 5.15-6 in the AFC (Palomar 2001a) show and list the location of sensitive receptors in the project vicinity. The two closest sensitive receptors are the Del Dios Middle School located approximately one mile southeast of the proposed site, and Little County Preschool located approximately one mile south-southeast of the site.

IMPACTS AND ANALYSIS

Staff reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals and natural gas were evaluated.

METHODOLOGY

In order to assess the potential for released hazardous materials to travel off-site and affect the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some hazardous materials must be used at power plants. Therefore, staff conducted its analysis by examining the choice and amounts of chemicals to be used, the manner in which the applicant will use the chemicals, the manner they will be transported to the facility and transferred to facility storage tanks, and the way the applicant plans to store the materials on-site.

Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage. Engineering controls are those physical or

mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures that workers at the facility must follow that will help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off-site and causing harm to the public.

Staff reviewed and evaluated the applicant's proposed use of hazardous materials as described by the applicant (Palomar 2001a, AFC Section 5.12). Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in Tables 2.4-5 of the AFC and determined the need and appropriateness of their use.
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- Step 5: Staff analyzed the theoretical impacts on the public of a worst-case spill of hazardous materials even with the mitigation measures proposed by the applicant. When mitigation methods proposed by the applicant are sufficient, no further mitigation is recommended. If the proposed mitigation is not sufficient to reduce the potential for adverse impacts to an insignificant level, staff will propose additional prevention and response controls until the potential for causing harm to the public is reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

PROJECT IMPACTS

Small Quantity Hazardous Materials

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will be stored in a solid form or in smaller quantities, have low mobility, or have low levels of toxicity. These hazardous materials, which were eliminated from further consideration, are discussed briefly below.

During the construction phase of the project, the only hazardous materials proposed for use include paint, paint thinner, cleaners, solvents, sealants, gasoline, diesel fuel, motor oil, hydraulic fluid, welding flux and gases, lubricants and emergency refueling

containers. Any impact of spills or other releases of these materials will be limited to the site due to the small quantities involved. Fuels such as fuel oil #6, mineral oil, lube oil, and diesel fuel are all of very low volatility and represent limited off-site hazard even in larger quantities.

The use of hydrogen gas poses a risk of explosion. However, the quantity present indicates that any blast effect will be confined to the site and will not have significant off-site impacts. As a further precaution, staff proposes Condition of Certification **HAZ- 10** that would require the applicant to store the hydrogen cylinders in an area isolated from combustion sources. The tanks and piping that are near potential traffic hazards will be protected from vehicle impact by traffic barriers.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials: sodium hypochlorite, sodium hydroxide, natural gas, sulfuric acid and aqueous ammonia.

Large Quantity Hazardous Materials

Sulfuric acid, sodium hydroxide and sodium hypochlorite will be stored on-site but do not pose a risk of off-site impacts because they have relatively low vapor pressures and thus the impact of spills would be confined to the site. Staff found no hazard would be posed to the public due to the extremely low volatility of these solutions. However, in order to protect against risk of volatilizing sulfuric acid in a fire, staff proposes Condition of Certification **HAZ-5** that will require that no combustible or flammable material is stored within 100 feet of the sulfuric acid tank.

Natural Gas

Natural gas poses a fire and/or explosion risk as a result of its flammability. Natural gas is composed of mostly methane, but also contains ethane, propane, nitrogen, butane, isobutane and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is ninety percent in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or explosion if a release were to occur. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1983), natural gas is less likely to cause explosions than many other fuel gases, such as propane or liquefied petroleum gas.

While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices. In particular, gas explosions can occur in the heat recovery steam generator (HRSG) and during start-up. The National Fire Protection Association (NFPA 85A) requires 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. The safety management plan proposed by the applicant would address the handling and use of natural gas and

significantly reduce the potential for equipment failure due to improper maintenance or human error.

Since the proposed facility would require the upgrade of an existing gas pipeline off-site, impacts from this pipeline need to be evaluated. The design of the natural gas pipeline is governed by the laws and regulations discussed here. These LORS require use of high quality arc welding techniques by certified welders and inspection of welds. Many failures of older natural gas lines have been associated with poor quality welds or corrosion. Current codes address corrosion failures by requiring use of corrosion resistant coatings and cathodic corrosion protection. Another major cause of pipeline failure is damage resulting from excavation activities near pipelines. Current codes address this mode of failure by requiring clear marking of the pipeline route. An additional mode of failure particularly relevant to the project area is damage caused by earthquake. Existing codes also address seismic hazard in design criteria (asdiscussed below). Evaluation of pipeline performance in recent earthquakes indicates that pipelines designed to modern codes perform well in seismic events while older lines frequently fail. Staff believes that existing regulatory requirements are sufficient to reduce the risk of accidental release from the pipeline to insignificant levels.

Failures of gas pipelines, according to data from the U.S. Department of Transportation (the National Transportation Safety Board) from the period 1984 - 1991, occur as a result of pipeline corrosion, pipeline construction or materials defects, rupture by heavy equipment excavating in the area such as bulldozers and backhoes, weather effects, and earthquakes. Given the gas line failures which occurred in the Marina District of San Francisco during the 1989 Loma Prieta earthquake, the January 1994 Northridge earthquake in Southern California, and the January 1995 gas pipeline failures in Kobe, Japan, as well as the January 19, 1995 gas explosion in San Francisco, the safety of the gas pipeline is of paramount importance. However, it must be noted that those pipelines which failed were older and not manufactured nor installed to modern code requirements. The February 2001 Nisqually Earthquake near Olympia, Washington, caused no damage to natural gas mains and there was only one reported gas line leak due to a separation of a service line going into a mobile home park.

SDG&E will construct an upgrade of 2600 feet of 16-inch pipeline upgrading a bottleneck in their pipeline located about 1 mile northwest of the facility. If release of gas occurs as a result of pipe, valve, or other mechanical failure or external forces, significant quantities of compressed natural gas could be released rapidly. Such a release can result in a significant fire and/or explosion hazard, which could cause loss of life and/or significant property damage in the vicinity of the pipeline route. However, the probability of such an event is extremely low if the pipeline is constructed according to present standards.

According to DOT statistics, the frequency of reportable incidents is about 0.25 for all pipeline incidents per 1,000 miles per year or 2.5×10^{-4} incidents per mile per year. DOT has also evaluated and categorized the major causes of pipeline failure. The four major causes of accidental releases from natural gas pipelines are: outside forces-43 percent, corrosion-18 percent, construction/material defects-13 percent, and other-26 percent.

Outside forces are the primary causes of incidents. Damage from outside forces includes damage caused by use of heavy mechanical equipment near pipelines (e.g., bulldozers and backhoes used in excavation activities), weather effects, vandalism, and earthquake-caused rupture as seen in the Marina District of San Francisco during the 1989 Loma Prieta Quake and in Kobe, Japan in January 1995. The fourth category, "Other" includes equipment component failure, compressor station failures, operator errors and sabotage. The average annual service incident frequency for natural gas transmission systems varies with age, the diameter of the pipeline, and the amount of corrosion.

Older pipelines have a significantly higher frequency of incidents. This results from the lack of corrosion protection and use of less corrosion resistant materials compared to modern pipelines, limited use of modern inspection techniques, and higher frequency of incidents involving outside forces. The increased incident rate due to outside forces is the result of the use of a larger number of smaller diameter pipelines in older systems, which are generally more easily damaged, and uncertainty regarding the locations of older pipelines.

In the United States, extensive federal and state pipeline codes and safety enforcement minimize the risk of severe accidents related to natural gas pipelines. In November 2000, the DOT Office of Pipeline Safety proposed a program requiring the preparation of risk management plans for gas pipelines throughout the United States. These risk management plans will include the use of diagnostic techniques to detect internal and external corrosion or cracks in pipelines and to perform preventive maintenance. The project owner will be required to develop and implement these plans if the proposal is promulgated as a regulation.

The following safety features will be incorporated into the design and operation of the natural gas pipeline (as required by current federal and state codes): (1) while the pipeline will be designed, constructed, and tested to carry natural gas at a certain pressure, the working pressure will be less than the design pressure; (2) butt welds will be X-rayed and the pipeline will be tested with water prior to the introduction of natural gas into the line; (3) the pipeline will be surveyed for leakage annually (4) the pipeline will be marked to prevent rupture by heavy equipment excavating in the area; and (5) valves at the meter will be installed to isolate the line if a leak occurs. These requirements will be administered by the federal government and the PUC.

Aqueous Ammonia

Aqueous ammonia and natural gas are the only hazardous materials that may pose a risk of off-site impacts. Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NO_x) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in very high down-wind concentrations of ammonia gas. One storage tank will be used to store the 19.5% aqueous ammonia with a maximum capacity of 20,000 gallons.

The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia, which will be

used and stored on-site. However, as with aqueous hypochlorite, the use of aqueous ammonia instead of the much more hazardous anhydrous ammonia (i.e. ammonia that is not diluted with water) poses far less risk.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four "bench mark" exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 150 ppm (recently changed from the 200 ppm value), which is also the RMP level 1 criterion used by EPA and and most administering agencies in California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis. If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff presumes that the potential release poses a risk of significant impact. However, staff also assesses the probability of occurrence of the release and/or the nature of the potentially exposed population in determining whether the likelihood and extent of potential exposure is sufficient to support a finding of potentially significant impact.

Section 5.12.3.1 of the AFC (Palomar 2001a) describe the modeling parameters used for the worst case accidental releases of aqueous ammonia in the applicant's Off-site Consequence Analysis. According to the applicant, the worst-case release is associated with a failure of a tanker truck releasing 6,100 gallons into a concrete-lined covered sump located in the truck unloading area. The transfer spill is assumed to continue for 10 minutes, releasing 400 pounds per minute. Winds of 1.5 meter per second and category F stability are assumed at the time of the accidental release. The RMP*comp and SCREEN3 air dispersion models were used to estimate airborne concentrations of ammonia. The RMP*comp only estimates the distance at which the concentration of the spilled material falls below the Emergency Response Planning Guidelines Level 2 (ERPG-2) and the SCREEN3 allows estimates of ammonia concentrations as a function of downwind distance.

The results of the applicant's modeling showed that off-site airborne concentrations of ammonia would not exceed the level staff uses to establish insignificance (75 ppm) at any off-site location. The maximum concentration at the site boundary (35 meters or 115 feet away from the unloading area) is approximately 60 ppm (Palomar 2001a, AFC Table 5.12-1). Staff has reviewed this Off-site Consequence Analysis and found the results to be consistent with previous modeling efforts conducted for other power plants.

The Applicant stated that a catastrophic failure of an ammonia storage tank is considered extremely remote and thus this scenario was not evaluated (Palomar 2001a, Page 5.12-6). Staff, however, believes that even though a failure may be remote, the applicant should provide engineering containment to prevent significant off-site impacts should a failure occur. Therefore, staff conducted SCREEN 3 modeling for several different scenarios associated with a failure of the aqueous ammonia storage tank. Staff assessed the potential for impact from a spill into the secondary containment (800 square feet surface area) with no drainage into a subsurface sump and a spill where the

aqueous ammonia drained into the subsurface sump proposed for placement under the tanker truck transfer area. In that case, the drain opening would be no more than 4 square feet. Because the AFC did not adequately describe the surface area of the secondary containment area or the size of the drain opening of the subsurface "covered collection sump" proposed for placement below the storage tank area, staff used areas typically found at other power plant containment areas. Staff evaluated the impacts if the spill occurred at temperatures of 85°F and 120°F. The US EPA SCREEN3 model was run for urban terrain, wind speed of 1.0 m/s, and atmospheric stability class F.

The results of staff's modeling show concentrations much higher than 75 ppm at the fence line (115 feet) for a spill with a surface area of 800 square feet. For spills where the aqueous ammonia was diverted to a subsurface "covered collection sump" with an opening no greater than 4 square feet, the highest concentration estimated at the fence line was 26 ppm. Based on these results of staff's Off-site Consequence Analysis, staff finds that secondary containment for the aqueous ammonia is needed to mitigate impacts to a level of insignificance. Staff thus proposes an additional Condition of Certification **HAZ-11** which would require the applicant to construct the secondary containment area for the aqueous ammonia storage tank in a way that it would drain into a subsurface "covered collection sump" with a drain opening no larger than 4 square feet in area. Staff therefore finds that due to the engineering controls proposed to be implemented by the applicant, and required by staff for the storage and transfer of aqueous ammonia, any accidental release of aqueous ammonia used for the project will not cause a significant impact.

Transportation of Hazardous Materials

Hazardous materials, including aqueous ammonia and sodium hypochlorite, will be transported to the facility via tanker truck. While many types of hazardous materials will be transported to the site, staff believes that transport of aqueous ammonia poses the predominant risk associated with hazardous materials transport.

Staff reviewed the Applicant's proposed transportation routes for hazardous materials delivery (Palomar 2001a, AFC Section 5.11.2.2). Ammonia can be released during a transportation accident. The extent of impact in the event of such a release would depend on the location of the accident and on the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent on three factors:

- the skill of the tanker truck driver;
- the type of vehicle used for transport;and
- accident rates.

To address this concern, staff evaluated the risk of an accidental transportation release in the project area. Staff's analysis focused on the project area after the delivery vehicle leaves the main highway (Highway 78). Staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on California Highways to ensure safe handling in general transportation (see the Federal Hazardous Materials Transportation Law 49 USC §5101 et seq., The U.S. Department of Transportation Regulations 49 CFR Subpart H, §172-700, and California DMV Regulations on Hazardous Cargo). These regulations also address the issue of driver

competence. See AFC section 6.4.11 for additional information on regulations governing the transportation of hazardous materials.

To address the issue of tank truck safety, aqueous ammonia will be delivered to the proposed facility in Department of Transportation (DOT) certified vehicles with design capacity of 6,100 gallons. These vehicles will be designed to DOT Code MC-307. These are high integrity vehicles designed for hauling of caustic materials such as ammonia. Staff has, therefore, proposed Condition of Certification **HAZ-8** to ensure that regardless of which vendor supplies the aqueous ammonia, delivery will be made in a tanker, which meets or exceeds the specifications described by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on six references and three federal government databases to assess the risks of a hazardous materials transportation accident.

Staff used the data from the Davies and Lees (1992) article, which references the 1990 Harwood et al. study, to determine that the frequency of release for transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per million miles traveled on well designed roads and highways. The maximum usage of aqueous ammonia each year of operation of the proposed Palomar Energy Project will require about five tanker truck deliveries of aqueous ammonia per month (approximately 60 per year). Each delivery will travel a little more than one mile (~1 and 1/8 miles) between Highway 78 and the facility per delivery along Nordahl Road and Citracado Parkway. The result is about 68 miles of delivery tanker truck travel in the project area per year. Staff finds that the risk over this distance is insignificant.

Staff therefore believes the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility are insignificant because of the remote possibility of accidental release of a sufficient quantity to present a danger to the public. The transportation of similar volumes of hazardous materials on the nation's highways is not unique nor an infrequent occurrence. Staff's analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is less than significant.

Based on the environmental mobility, toxicity, quantities present at the site and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with hazardous materials transportation and use at the proposed facility. Based on this, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility does not significantly increase the risk of impact beyond that associated with ammonia transportation.

Seismic Issues

The possibility exists that an earthquake would cause the failure of a hazardous materials storage tank and rupture of the natural gas pipeline. A quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves, pumps, neutralization systems and the foam vapor suppression system. The failure of all these preventive control measures might then

result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. The effects of the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan, in January 1995, heighten the concern regarding earthquake safety.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused to several large storage tanks and smaller tanks associated with the water treatment system of a cogeneration facility. Those tanks with the greatest damage, including seam leakage, were older tanks, while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards, which should be followed in adequately designing and building storage tanks and containment areas as well as the natural gas pipeline to withstand a large earthquake. Staff finds that the proposed facility will be designed and constructed to the applicable standards of the Uniform Building Code for Seismic Zone 4, CPUC General Order 112E, and the CFR Regulation 49 Part 192.

CUMULATIVE IMPACTS

Staff reviewed the potential for the Palomar Energy project, combined with existing facilities, to result in cumulative impacts on the population within the area. Facilities that could potentially contribute to cumulative impacts are the two operating small power plants, CalPeak and RAMCO, located under 0.5 miles north and northeast of the proposed Palomar project, and the planned ERTC industrial park (Palomar 2001a, AFC Section 5.12.6). The applicant will develop and implement a hazardous materials handling program for the Palomar project independent of the other projects considered for potential cumulative impacts (Palomar 2001a Page 5.12-13). Staff finds that the facility, as proposed by the applicant and with the additional mitigation measures proposed by the staff, poses a minimal risk of accidental release that could result in off-site impacts. It is unlikely that an accidental release that has very low probability of occurrence (about one in one million per year) would independently occur at the Palomar site and another facility at the same time. Therefore, staff concludes that the facility would not contribute to a significant cumulative impact.

APPLICANT'S PROPOSED MITIGATION

The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of both engineering and administrative controls. Elements of facility controls and the safety management plan are summarized below.

ENGINEERING CONTROLS

Engineering controls prevent accidents and releases (spills) from causing off-site impacts on surrounding communities by incorporating engineering safety design features into the design of the facility. The engineered safety features proposed by the applicant for use at this facility include:

- construction of curbs, berms, and/or catchment basins surrounding each of the hazardous materials storage areas to contain accidental releases that might happen during storage or delivery;

- physical separation of stored chemicals in separate containment areas in order to prevent accidental mixing of incompatible materials which may result in the evolution and release of toxic gases or fumes;
- paving the truck pad with concrete and with a sufficient berm to provide secondary containment for the entire contents of the tank truck plus 10 percent to account for precipitation, with drainage from the delivery pad berm to be directed to a covered concrete trench constructed next to the ammonia storage tank; and
- process protective systems including tank level monitors, automatic shut-off valves, double-wall piping, and fire protection systems.

ADMINISTRATIVE CONTROLS

Administrative controls also help to prevent accidents and releases (spills) from causing off-site impacts on communities by establishing worker training programs, process safety management programs and by complying with all applicable health and safety laws, ordinances and standards.

A worker health and safety program will be prepared by the applicant and will include (but is not limited to) the following elements:

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- procedures to ensure the proper use of personal protective equipment;
- safety operating procedures for operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and
- emergency response actions including facility evacuation, hazardous material spill cleanup, and fire prevention.

At the facility, the project owner will be required to designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety official will oversee the health and safety program and will have the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community in the event that the health and safety program is violated.

ON-SITE SPILL RESPONSE

In order to address the issue of spill response, the facility will prepare and implement an Emergency Response Plan which includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, prevention equipment and capabilities. Emergency procedures will be established which include evacuation; spill cleanup, hazard prevention, and emergency response.

Fire support services to the site will be provided by the City of Escondido Fire Department (EFD). Fire Station No. 1 is the closest station to the site and is located at 310 North Quince Street, approximately 3.5 miles from the project site. The response

time to the project site is estimated to be less than 6 minutes. Station 5 is located at 2319 Felicita, approximately 5.5 miles from the project site; would be the second responder with an estimated response time of less than 10 minutes (EFD 2002). In conversations with the Escondido Fire Department (EFD 2002), staff determined that Fire Station No. 1 is adequately equipped and manned. Staff further determined that the response time is adequate and consistent with the UFC and the NFPA.

The Escondido fire stations are considered first responders for hazardous materials (HazMat) incidents with backup service provided by the San Diego County HazMat Response Team (EFD 2002). Staff finds that the response time for hazardous materials response is excellent and that the County HazMat Response Team is adequately trained and equipped to respond in a timely manner (San Diego County 2002).

STAFF'S PROPOSED MITIGATION

Staff proposes eleven Conditions of Certification mentioned throughout the text (above) and listed below. **HAZ-1** ensures that no hazardous material would be used at the facility except those listed in the AFC unless there is prior approval by the County and the California Energy Commission Compliance Project Manager (CPM). **HAZ-2** requires that a Risk Management Plan (RMP) be prepared and submitted prior to the delivery of aqueous ammonia.

The worst-case accidental release scenario evaluated in the AFC assumed that accidental spills of aqueous ammonia would occur during transfer from the delivery tanker to the storage tank. Staff believes this accident scenario is the most probable, and therefore proposes a condition (**HAZ-3**) requiring development of a safety management plan for the delivery of aqueous ammonia. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures and the required RMP. **HAZ-4** & **HAZ-11** require that the aqueous ammonia storage tank be designed to certain rigid specifications and drain into a covered sump, **HAZ-5** addresses the storage of sulfuric acid, and **HAZ-6,** & **7** address the safety of the gas pipeline. The transportation of hazardous materials is addressed in **HAZ-8 and HAZ-9**. Hydrogen storage is addressed in **HAZ-10**.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed Palomar Energy project (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure 1**, there are several census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters. The nearest minority pocket is approximately 2 miles east of the project site. Staff also reviewed Census 1990 information that shows the low-income population is less than 50 percent within the same radius. Because staff has determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for **Hazardous Materials Management**.

With implementation of staff's proposed conditions of certification the proposed project will not cause significant direct or cumulative impacts resulting from the construction or operation and, therefore, there will be no impacts on minority populations from the use or transport of hazardous materials related to this project.

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, San Diego County Environmental Health Services Department, and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties.

CONCLUSIONS AND RECOMMENDATIONS

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose no significant potential for impacts on the public. With adoption of the proposed Conditions of Certification, the proposed project will comply with all applicable laws, ordinances, regulations and standards (LORS). In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop an RMP. To insure adequacy of the RMP, staff's proposed Condition of Certification **HAZ-2** requires that the RMP be submitted for concurrent review by U.S. EPA, San Diego County, and staff. In addition, staff's proposed Conditions of Certification require San Diego County's review, and staff's review and approval of the RMP prior to delivery of any hazardous materials to the facility. Other proposed Conditions of Certification address the issue of the transportation, storage, and use of aqueous ammonia.

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

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix C, below, or in greater quantities than those identified by chemical name in Appendix C, below, unless approved in advance by the CPM.

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

HAZ-2 The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) to the Certified Unified Program Authority – (CUPA) (San Diego County Environmental Health Services Department) and the CPM for review at the time the RMP is first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall reflect all recommendations of the CUPA and the CPM in the final documents. Copies of the final Business Plan and RMP, reflecting all comments, shall be provided to the CPM.

Verification: At least 60 days prior to receiving any hazardous material on the site, the project owner shall provide a copy of a final Business Plan to the CPM. At least 60 days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final EPA-approved RMP, to the CUPA and the CPM.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of aqueous ammonia with incompatible hazardous materials.

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

HAZ-4 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, a secondary containment basin capable of holding 125% of the storage volume shall protect the storage tank plus the volume associated with 24 hours of rain assuming the 25-year storm. The final design drawings and specifications for the ammonia storage tank and secondary containment basins shall be submitted to the CPM.

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

HAZ-5 The project owner shall ensure that no combustible or flammable material is stored within 100 feet of the sulfuric acid tank.

Verification: At least 60 days prior to receipt of sulfuric acid on-site, the Project Owner shall provide copies of the facility design drawings showing the location of the sulfuric acid storage tank and the location of any tanks, drums, or piping containing any combustible or flammable materials

HAZ-6 The project owner shall require that the gas pipeline undergo a complete design review and detailed inspection 30 years after initial startup and every 5 years thereafter.

Verification: At least 30 days prior to the initial flow of gas in the pipeline, the project owner shall provide outline of the plan to accomplish a full and comprehensive pipeline

design review to the CMP for review and approval. The full and complete plan shall be amended, as appropriate, and submitted to the CPM for review and approval, not later than one year before the plan is implemented by the project owner.

HAZ-7 After any significant seismic event in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline shall be inspected by the project owner.

Verification: At least 30 days prior to the initial flow of gas in the pipeline, the project owner shall provide a detailed plan to accomplish a full and comprehensive pipeline inspection in the event of an earthquake to the CPM for review and approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, at least every five years.

HAZ-8 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles which meet or exceed the specifications of DOT Code MC-307.

Verification: At least 60 days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-9 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM (Highway 78 to Nordahl Road to Citracado Parkway and then into the facility). The project owner shall obtain approval of the CPM if an alternate route is desired.

Verification: At least 60 days prior to receipt of any hazardous materials on site, the project owner shall submit copies of the required transportation route limitation direction to the CPM for review and approval.

HAZ-10 The project owner shall ensure that the hydrogen gas storage cylinders are stored in an area out of the plane of the turbines and that no combustible or flammable material is stored within 100 feet of the hydrogen cylinders.

Verification: At least 60 days prior to receipt of hydrogen gas on-site, the Project Owner shall provide copies of the facility design drawings showing the location of the hydrogen gas cylinders and the location of any tanks, drums, or piping containing any combustible or flammable material and the route by which such materials will be transported through the facility.

HAZ-11 The aqueous ammonia storage tank shall be protected by a surface secondary containment area designed in such a manner that in the event of a tank failure, the contents will flow into this surface containment area and then immediately into a subsurface “covered collection sump” with a drain opening no greater than 4 square feet.

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

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APPENDIX A

HAZARDOUS MATERIAL MANAGEMENT

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

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

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

HAZARDOUS MATERIAL MANAGEMENT
APPENDIX A TABLE 1

Acute Ammonia Exposure Guidelines

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

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)

* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

** The (NRC 1979) describes a study involving young animals, which suggests greater sensitivity to acute exposure in young animals. The (WHO 1986) warns that the young, elderly, asthmatics, those with bronchitis and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

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Abbreviations for Appendix A, Table 1

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

Appendix B

SUMMARY OF ADVERSE HEALTH EFFECTS OF AMMONIA

638 PPM

WITHIN SECONDS:

- Significant adverse health effects;
- Might interfere with capability to self rescue;
- Reversible effects such as severe eye, nose and throat irritation.

AFTER 30 MINUTES:

- Persistent nose and throat irritation even after exposure stopped;
- irreversible or long-lasting effects possible: lung injury;
- Sensitive people such as the elderly, infants, and those with breathing problems (asthma) experience difficulty in breathing;
- asthmatics will experience a worsening of their condition and a decrease in breathing ability, which might impair their ability to move out of area.

266 PPM

WITHIN SECONDS:

- Adverse health effects;
- Very strong odor of ammonia;
- Reversible moderate eye, nose and throat irritation.

AFTER 30 MINUTES:

- Some decrease in breathing ability but doubtful that any effect would persist after exposure stopped;
- Sensitive persons: experience difficulty in breathing;
- asthmatics: may have a worsening condition and decreased breathing ability, which might impair their ability to move out of the area.

64 PPM

WITHIN SECONDS:

- Most people would notice a strong odor;
- Tearing of the eyes would occur;
- Odor would be very noticeable and uncomfortable.
- Sensitive people could experience more irritation but it would be unlikely that breathing would be impaired to the point of interfering with capability of self rescue

- Mild eye, nose, or throat irritation
- Eye, ear, & throat irritation in sensitive people
- asthmatics might have breathing difficulties but would not impair capability of self rescue

22 or 27 PPM

WITHIN SECONDS:

- Most people would notice an odor;
- No tearing of the eyes would occur;
- Odor might be uncomfortable for some;
- sensitive people may experience some irritation but ability to leave area would not be impaired;
- Slight irritation after 10 minutes in some people.

4.0, 2.2, or 1.6 PPM

- No adverse effects would be expected to occur;
- doubtful that anyone would notice any ammonia (odor threshold 5 - 20 PPM);
- Some people might experience irritation after 1 hr.

APPENDIX C

[Attach AFC Table 3.4-7 here.]

LAND USE

Amanda Stennick

INTRODUCTION

This land use analysis of the Palomar Energy Project (PEP) 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 will be incompatible with existing and planned land uses if they create unmitigated noise, dust, health hazard, traffic, or visual impacts, or when they unduly restrict existing or planned future uses.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section describes federal, state, regional, and local land use laws, ordinances, regulations, or standards (LORS) applicable to the proposed project.

FEDERAL

There are no specific federal LORS associated with land use that apply to the project.

STATE

There are no specific state LORS associated with land use that apply to the project.

LOCAL

City of Escondido General Plan

State law requires that each city and/or county prepare and adopt a comprehensive General Plan for the physical development of the city or county. The General Plan must be internally consistent, and it must contain implementation measures to ensure its compliance.

There are seven mandated elements that must, by state law, be included in the General Plan: land use, circulation, housing, conservation, open space, noise and safety. The state also permits jurisdictions to adopt other elements, including but not limited to recreation, public services, scenic highways and historic preservation. California Government Code section 65302(a) mandates a land use element designating the proposed general distribution, general location, and extent of uses of the land. These state requirements are implemented through the Escondido General Plan and the Escondido Zoning Ordinance.

The City Council adopted the Escondido General Plan in June 1990 to guide the development and use of private and public lands within the community's boundaries. The Escondido General Plan Land Use Element designates the PEP site as Light Industrial. The Light Industrial land use designation provides for manufacturing, warehousing/distribution, assembling, and wholesaling (Escondido General Plan).

Goals and Objectives

The City has adopted a set of community goals and objectives as part of the General Plan. They provide the framework for establishing policies, standards, and guidelines for future growth in the City. The following Escondido General Plan goals are applicable to the PEP.

Goal 5: Encourage more high-quality industrial, retail, manufacturing, and service-oriented businesses that create and maintain a strong economic base and provide an environment for the full employment of a diverse set of skills.

A key objective of this goal, as it relates to the industrial sector, is to "value high technology, research and development, and various industrial uses as important integral parts of a sustainable economic base."

Goal 8: Preserve Escondido's natural and scenic resources

Relevant objectives of this goal are to "participate in efforts to attain state and federal air quality standards" and "to protect existing terrain, steep slopes, floodways, habitat areas and ridge lines, and to minimize visual impacts."

Goal 11: Provide a safe and healthy environment for Escondido residents

Relevant objectives include grading, drainage, and erosion control standards that "control surface runoff associated with new development while preserving natural resources," and "participate in local and regional programs to meet state and federal air quality standards."

Escondido Zoning Ordinance

While the General Plan designates the PEP site as Light Industrial, the site is zoned Specific Plan (SP) by the Escondido Zoning Code. Zoning Ordinance Article 18 Specific Plan (SP) Zone, section 33-393 specifies that permitted uses within the SP zone shall be fully defined through the adoption of a specific plan. General direction for permitted uses shall be established by the existing general plan designations. In addition, where the SP zone implements the "Specific Planning Area" (SPA) General Plan Overlay designation, permitted land uses shall be established in accordance with the policy direction provided in the Land Use Element text of the General Plan for that particular SPA. Zoning Ordinance Article 18 Specific Plan (SP) Zone, section 22-392 Development Regulations indicates that development standards for property zoned SP shall be established by a SP which shall be prepared and adopted pursuant to section 65450 of the Government Code. No property zoned SP can be developed without the adoption of a Specific Plan (Escondido Zoning Ordinance).

Escondido Research and Technology Center Specific Plan

The PEP site is also located within a Specific Plan (SP) land use and zoning designation, as identified by the Escondido General Plan and Zoning Ordinance. As stated in the Escondido General Plan Specific Planning Area Policy B7.1, Specific

Planning Areas (SPAs) are intended for areas which require submittal of specific plans prior to development, as described in Government Code sections 65450 through 65507.

The PEP site is part of what is currently designated by the General Plan as Specific Planning Area No. 8. Specific Planning Area No. 8, known as the Harmony Grove Specific Planning Area, or Quail Hills, was anticipated in the General Plan to be developed into "a high-quality industrial park, encouraging clean industrial uses to expand Escondido's industrial and employment base."

The Escondido Research and Technology Center Specific Plan (ERTCSP) currently under review by the City of Escondido, proposes to amend and supersede the Quail Hills Specific Plan, which was adopted in January 1988. The City of Escondido expects to adopt the ERTCSP in October 2002. If adopted, the ERTCSP will provide for orderly and coordinated development of the overall 208-acre ERTC property consistent with Section 65451 of the California Government Code and Article 18 of the City of Escondido Zoning Ordinance. The ERTCSP is a comprehensive zoning document which regulates development of the specialized industrial and office uses which will be included within the proposed project area (ERTCSP 2001). The proposed PEP would be a component of the proposed ERTC.

SETTING

SITE AND VICINITY DESCRIPTION

The PEP site is located within the northeast portion of the ERTCSP in the western portion of the City of Escondido. The ERTCSP encompasses approximately 208 acres, within which the PEP site is designated as Planning Area 1. Planning Area 1 consists of 20 gross acres.

The ERTCSP is located in a region of rapid urban growth, with industrial development occurring to the north and east. Land use in the project vicinity also includes commercial and residential development. The PEP site is essentially vacant and is bounded directly to the north by a vacant lot, on the east by existing industrial land uses, on the south by future industrial land uses within the SPA, and on the west by the existing San Diego Gas & Electric (SDG&E) 200-foot wide transmission corridor and future industrial land uses within the SPA. Significant portions of the ERTCSP, including the PEP site, have been disturbed by off-road vehicle activities and grading. A 200-foot-wide electrical transmission easement with steel lattice towers runs north-south through the center of the site. Numerous other utility easements, dirt roads, and trails traverse the site.

The site also has remnants of former agricultural uses. Specifically, the 20-acre PEP site includes a central graded area at an existing elevation of approximately 790 feet above mean sea level (msl), a largely cleared slope formerly used for agriculture located to the north of the graded area, and naturally vegetated slopes to the south of the graded area (ERTCSP 2001).

The PEP site contains approximately six acres of land classified as Farmland of Local Importance by the California Department of Conservation (DOC) of the California Resources Agency. The DOC had previously classified this land as Unique Farmland. No farming is occurring on this six-acre portion of the site, which contains the remnants of an abandoned avocado orchard.

Regional access to the PEP site is from State Route 78 (SR-78) and Interstate 15 (I-15). Local access is via the Nordahl Drive exit off SR-78, via the future Citracado Parkway, and the Ninth Avenue and Valley Parkway exits off I-15 to Vineyard Avenue from the southeast. The future Citracado Parkway is proposed as a "Major Road," and it will bisect the SPA traveling from north to south. Other streets in the area include Enterprise Street and Andreasen Drive, which serve the existing industrial park to the east, and Harmony Grove Road, which provides access from the south.

General Plan Designations and Zoning

The following section discusses the City of Escondido's land use designations, zoning, and land uses within one mile of the proposed PEP site.

North: General Plan land use designations to the north of the site are GI (General Industrial), LI (Light Industrial), E (Estate), and SP (Specific Plan). Zoning is M-1 (Light Industrial), M-2 (General Industrial), RE-20 (Residential Estates), and S-P (Specific Planning Area).

East: General Plan land use designations to the east of the site are GI (General Industrial), LI (Light Industrial), PC (Planned Commercial), and U (Urban). Zoning is M-1 (Light Industrial), M-2 (General Industrial), IP (Industrial Park), PD-C (Planned Development –Commercial), CG (General Commercial), R-1-6 (Single Family Residential), R-1-7 (Single Family Residential), PD-R (Planned Development – Residential), R-2-11 (Light Multiple Residential), and R-2-8 (Light Multiple Residential).

South: General Plan land use designations to the south of the site are SP (Specific Plan), E (Estate), U (Urban), and R(Rural). Zoning is S-P (Specific Planning Area), and RE-20 (Residential Estates).

West: General Plan land use designations to the west of the site are SP (Specific Plan), and E (Estate). Zoning is S-P (Specific Planning Area) and RE-20 (Residential Estates).

Surrounding Land Uses

As indicated by General Plan designations and zoning, lands within one mile of the PEP site are dominated by existing and planned urban and industrial uses. This urban landscape continues for several miles towards the center of the City of Escondido. The most notable urban feature in the project vicinity is the I-15/SR 78 interchange to the northeast. The areas to the north and northwest are also dominated by urban land uses. Property to the south is generally vacant, with sporadic single-family homes on large lots.

While industrial parks and other heavily urbanized landscapes occupy the area immediately to the east of the SPA, residences are interspersed within a one-mile

radius of the PEP site. Multi-family residential development is located in the southern portion of the study area, with the nearest residence being located approximately 2,800 feet from the PEP site. Residential development also exists directly west of the SPA. The closest residence to the site is located approximately 1,850 feet from the site. Further west of the SPA is vacant unincorporated County of San Diego land; however, it is currently designated and zoned for rural and large-lot residential development.

Existing land uses in the study area are primarily industrial; however two schools and one park are located at the edge of the one-mile radius. According to Section 5 of the General Plan, Community Open Space/Conservation, there are no prime agricultural lands within the study area.

AGRICULTURAL USES

As noted in the **SITE AND VICINITY** discussion, the PEP site contains about six acres of Farmland of Local Importance. Section 5.6 of the Application for Certification (AFC) states that the northern portion of the PEP site contains six acres of Unique Farmland, as shown in AFC Figure 5.6-1, and on the DOC's 1998 Important Farmland map for San Diego County (Palomar 2001a). Unique Farmland is considered a significant resource under the California Environmental Quality Act (CEQA).

In recent field visits to the site, staff has observed that the northern portion contains a number of tree stumps and a few abandoned avocado trees, which are the remnants of an avocado orchard. If the site contained an actively farmed avocado orchard, it would qualify for the Unique Farmland designation. However, since 1998, the DOC staff has updated the Important Farmland map to reflect the removal of most of the trees and the overall lack of farming. The map updating process has resulted in DOC downgrading the northern portion of the PEP site and the ERTC site to Farmland of Local Importance, which is not a significant resource under CEQA (DOC 2000). The PEP's conversion of six acres of Farmland of Local Importance is not a significant impact.

PLANNED LAND USES - ERTCSP

The ERTCSP, currently under review has been proposed to amend and supersede the Quail Hills Specific Plan. The ERTCSP encompasses approximately 208 acres including the Palomar Energy site. Of the 208 acres within the ERTCSP, approximately 186 acres are designated for industrial and urban uses, and the remaining 22 acres are proposed for residential development (ERTCSP 2001). The City of Escondido prepared a Notice of Preparation (NOP) on the project in December 2001, and the 2002 Draft Environmental Impact Report (DEIR) on the ERTCSP is currently under review by the City, Energy Commission staff, and other responsible agencies. The City of Escondido expects to adopt the ERTCSP in October 2002.

The ERTCSP will provide for orderly and coordinated development of the overall 208-acre business park property consistent with section 65451 of the Government Code and Article 18 of the City of Escondido Zoning Ordinance. The site and general surrounding area have been designated Light Industrial since adoption of the General Plan. The purpose of this designation is to provide sites for light industrial firms engaged in processing, assembling, manufacturing, warehousing and storage, research and

development, as well as for incidental service facilities and public facilities to serve the manufacturing area.

IMPACTS

THRESHOLDS OF SIGNIFICANCE

Significance criteria are based on the CEQA Guidelines, the CEQA Environmental Checklist Form (adopted January 1, 1999), and on performance standards or thresholds adopted by responsible agencies. An impact may be considered significant if the project results in:

- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- disruption or division of the physical arrangement of the established community;
- conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural uses.

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

A project may also have a significant impact on land use, in terms of environmental justice, if it would create significant unmitigated disproportionate impacts in an area with a population consisting of at least 50 percent minority or low-income residents.

PROJECT FEATURES

Sempra Energy Resources intends to develop the proposed PEP under the Alternative B use program for Planning Area 1 in the ERTCSP. Alternative B allows for an electrical power generating facility.

LINEAR FACILITIES

The PEP will be fueled with natural gas delivered via an (SDG&E) gas system. An existing 16-inch SDG&E natural gas pipeline, located immediately adjacent to the northeast corner of the project site at the end of Enterprise Street, has sufficient capacity to serve the project. However, SDG&E proposes to construct an upgrade consisting of approximately 2,600 feet of 16-inch pipeline in order to alleviate an existing deficiency in the gas system.

The City of Escondido Hale Avenue Resource Recovery Facility (HARRF) will supply reclaimed water for the project. Reclaimed water to the site will be conveyed via a new 1.1-mile, 16-inch supply pipeline extending from a connection point located on Harmony Grove Road. From this connection point, the pipeline will extend northwest along Harmony Grove Road to the existing transmission corridor located within the SPA, and

north either along the SDG&E transmission corridor or along the Citracado Parkway to the project site. The reclaimed water line will be underground for its entire length.

A new 1.1-mile, 8-inch return pipeline routed alongside the reclaimed water supply pipeline will be constructed to facilitate the transport of brine from the project to the City of Escondido HARRF. The brine return pipeline will connect to an existing City of Escondido brine return line. This line also will be underground.

Except for the segment of the water supply and brine return pipeline route that traverses the ERTC industrial park property, the pipelines all will be installed within the rights-of-way of existing roadways (Palomar 2001a).

CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding, including, but not limited to the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the Commission make any finding in conflict with applicable federal law or regulation.

When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity (Pub. Resources Code 25523(d)(1)). The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the project is consistent or at variance with each requirement or standard.

City of Escondido General Plan

Staff has reviewed the relevant goals and objectives of the Escondido General Plan, and has concluded that the Palomar Energy Project, including its linear facilities, is consistent with the General Plan, specifically Goal 5, "Encourage more high-quality industrial, retail, manufacturing, and service-oriented business that create and maintain a strong economic base and provide an environment for the full employment of a diverse set of skills." The project would assist in meeting the City's General Plan goal for this area. Development would not conflict with applicable environmental plans or policies, nor affect agricultural resources or operations, and would not disrupt or divide the physical arrangement of an established community. Impacts would be less than significant.

Escondido Research and Technology Center Specific Plan

The ERTCSP creates the regulatory processing and implementation framework to allow the PEP project (and the larger business park where it is situated) to develop. The PEP site is part of what is currently designated by the General Plan as Specific Planning Area No. 8. Specific Planning Area No. 8, known as the Harmony Grove Specific

Planning Area, or Quail Hills, was anticipated in the General Plan to be developed into a high-quality industrial park, encouraging clean industrial uses to expand Escondido's industrial and employment base.

The City of Escondido's Regulatory Procedure Under CEQA

The City of Escondido adopted the Quail Hills Specific Plan in January 1988, by Resolution 88-126. As indicated in the Quail Hills Specific Plan, land use designations within the project area were intended to include areas devoted to General Industrial, a Mixed-Use Activity Center, Business Commercial, and offices. The ERTCSP, which is currently under review, proposes to amend and supersede the Quail Hills Specific Plan.

As lead agency under CEQA, the City of Escondido has prepared a NOP and DEIR on the ERTCSP. The NOP was reviewed by the following agencies, which have approval authority over some aspect of the project: United States Army Corps of Engineers; United States Fish and Wildlife Service; California Department of Fish and Game; Regional Water Quality Control Board; Federal Communication Commission; Federal Energy Regulatory Commission; and the San Diego County Local Agency Formation Commission. Energy Commission staff also reviewed the NOP. The DEIR is currently being circulated to responsible agencies for review and comment.

In addition to the ERTCSP, the proposed ERTC business park will require the City to amend the Circulation Element and the Land Use Element of their General Plan, and review the Tentative Subdivision Map for approval in accordance with the State Subdivision Map Act, and the City of Escondido Subdivision Ordinance. All planning documents requiring environmental review under CEQA are being reviewed for approval concurrently with the ERTCSP by the City of Escondido. The City expects to have Planning Commission adoption of the ERTCSP, General Plan amendments, and Tentative Subdivision Map in late October (Delgadillo 2002). Energy Commission staff will then use the City of Escondido's Final Environmental Impact Report on the ERTCSP as part of our environmental analysis of the proposed PEP.

ERTCSP Components

As indicated previously, the PEP site is designated as Planning Area 1 within the draft ERTCSP, currently under City review. Chapter II of the ERTCSP provides a set of comprehensive policies and standards to govern various aspects of development within the SPA. It identifies land use, circulation, design, and planning area policies and general architectural and landscape standards for the overall 208-acre SPA to ensure community compatibility, adequacy of access, parking, landscaping and other features which are characteristic of a quality development.

Chapter III of the ERTCSP translates the policies and standards identified in Chapter II into use categories, design and development standards for each planning area. The following describes permitted uses, design and development standards for Planning Area 1 as identified in Chapter III of the ERTCSP.

ERTCSP Planning Area 1 Permitted Uses

According to Chapter III of the ERTCSP, two alternative permitted use programs are designated for Planning Area 1. Alternative A would allow for light industrial type uses,

while Alternative B would allow for the PEP. According to the ERTCSP, Alternative B would consist of a nominal 550-megawatt power generation facility to be fueled exclusively with natural gas. Support services for the power generation facility, including employee cafeteria, employee recreational facilities, storage buildings, or auditorium accessory with and incidental to a permitted use (intended primarily for the express use of those persons employed at the firm or use where such incidental use is applied). Accessory uses and structures are acceptable when related and incidental to a permitted use such as, but not limited to, food preparation, food service and eating facilities.

According to the ERTCSP, selection of Alternative A versus Alternative B shall be at the sole discretion of the developer. The PEP project is consistent with the permitted uses as described under the Alternative B permitted use program for Planning Area 1 of the ERTCSP.

Access

According to Chapter III of the ERTCSP, one location of primary private ingress and egress from the planned Citracado Parkway shall be paved to a minimum width of 30-foot apron with a 28-foot minimum driveway. A divider island may be provided to separate lanes. A second location of secondary, emergency ingress and egress from Citracado Parkway shall be paved to a minimum width of 22-foot apron with a 20-foot minimum driveway width.

Lot Size

According to Chapter III of the ERTCSP, under Alternative B, Planning Area 1 shall not be additionally subdivided beyond the Master Tentative Map subdivision.

Building Coverage

According to Chapter III of the ERTCSP, buildings may cover any area not required by this specific plan for setbacks, landscaping, or parking.

Building Height

Planning Area 1 is a significantly excavated area allowing extensive use of topography to provide visual screening of the structures.

For Alternative A, the maximum building height of the operations building shall be 60 feet from the finished floor elevation of the approved site plan, measured to the top of the parapet. Parapets extended to form tower or signage elements, architectural monuments and features, rooftop equipment and screening shall be allowed to extend 10 feet above the 60-foot building height.

In the event Planning Area 1 is developed pursuant to Alternative B, the height limitation specified for Alternative A shall be applied to the operations building only, and the maximum height of exhaust stacks shall be 120 feet above the finished floor elevation.

Building Setbacks

The following building setbacks for structures located within Planning Area 1 have been identified in Chapter III of the ERTCSP:

a. Front Yard – No building or structure shall be located less than 200 feet from the right of way line of Citracado Parkway.

b. Side Yard – Every lot and building shall maintain a side yard of not less than 10 feet of fully landscaped area on each side.

c. Rear Yard – 10-foot minimum.

d. Parking shall be located no closer than 200 feet measured from the right of way line of Citracado Parkway.

Parking

According to Chapter III of the ERTCSP, parking spaces shall be provided at the ratio of 2.0 spaces per 1,000 square feet of occupied gross floor area.

Architectural Standards

As indicated in the ERTCSP, the design of the power generating facility equipment structures, by virtue of their relatively small area coverage and isolated position within the overall plan can support more varied and functional architecture. The side of the operations building which is nearest to and facing the site perimeter shall conform to the Comprehensive Policies and Design Guidelines set forth in Chapter II of this specific plan.

Landscaping Requirements

The following landscaping requirements identified in the ERTCSP relate to Planning Area 1:

a. A dense landscape screen of trees and screening shrubs shall be planted and maintained along the property and planning area boundary lines except for the area required for street access. The depth of the landscaping shall be a minimum of 10 feet on all sides. All landscape planters shall be provided with permanent watering facilities. Landscaping shall not obstruct vehicular or pedestrian sight lines.

b. One 15-gallon tree shall be planted per every six parking spaces within parking areas. Tree location and design shall be per City of Escondido Landscape Standards.

c. A permanent underground irrigation system will maintain all plantings.

d. The utility easement shall be restored to natural upland habitat and receive temporary irrigation, except near Vineyard Avenue where entry monumentation and ornamental plantings will occur.

Lighting

All proposed lighting shall be in conformance with the requirements of Chapter II, Section K of the ERTCSP. Outdoor lighting used after 11:00 P.M. for security purposes to illuminate equipment yards, streets or roadways (public or private), parking lots, and similar facilities shall be illuminated by shielded low pressure sodium lighting fixtures only. In addition, the ERTCSP indicates that the requirements of Chapter II shall be adapted to address design issues particular to a power generating facility.

Walls/Fencing

According to the ERTCSP, the perimeter of Planning Area 1 shall be secured with aesthetic steel fencing or screen walls, selected as appropriate for specific visual settings along the perimeter. Access to the site(s) shall be restricted to specific entries, and gate guarded entries axe allowed. Fencing internal to the site may be galvanized steel chain link security fencing.

Loading Areas

According to the ERTCSP, the location of loading areas shall be screened from view from Citracado Parkway. Design of the loading/unloading areas shall not restrict on-site circulation, fire lane, or parking and shall include a ten (10) foot high solid wall at the loading ramp.

Summary – Consistency with ERTCSP

As described above, the proposed land uses within the ERTCSP are consistent with the City's General Plan. Implementation of the proposed project would not conflict with the proposed ERTCSP, as the PEP is consistent with the permitted land use as described as Alternative B Land Use Program identified for Planning Area 1. Development of the PEP would not result in a subdivision of Planning Area 1 beyond the Master Tentative Map subdivision; therefore, the PEP would be consistent with this standard. The PEP, as proposed, also would be consistent with the design guidelines and development standards identified for Planning Area 1, including height limitations for the PEP operations building and stacks. Given the expected PEP operation workforce of 20 people, the planned parking area will be sufficient. Energy Commission staff finds that once the ERTCSP is adopted by the City of Escondido, the proposed PEP would be in conformance with the design guidelines and development standards contained therein. Thus, impacts would be less than significant.

Escondido Zoning Ordinance

Staff has reviewed the relevant sections of the Zoning Ordinance. The Zoning Ordinance requires that permitted uses and development standards within an S-P zone shall be fully defined through the adoption of a specific plan. The ERTCSP will amend and supersede the existing Quail Hills Specific Plan (which includes the project site) that was adopted by the City of Escondido in January 1988, by adoption of Resolution 88-126. Development of the PEP and linear facilities would be consistent with the permitted uses, development standards, and design guidelines as identified in the ERTCSP and therefore, with adoption of that plan, the proposed project would not conflict with the Escondido Zoning Ordinance.

Except for the segment of the water supply and brine return pipeline route that traverses the ERTC industrial park property, the pipelines all will be installed within the rights-of-way of existing roadways. The Zoning Ordinance allows underground pipelines in all zones.

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

Construction Impacts

Construction impacts of the PEP will be temporary and are expected to last approximately 21 months. The major construction activities will occur on-site and will not disrupt or divide surrounding land uses. The power plant project's linear facilities (predominantly offsite) will also have no significant land use impacts. The water supply, brine return, and natural gas pipelines all will be installed below ground. Except for the segment of the water supply and brine return pipeline route that traverses the ERTC industrial park property, the various pipelines all will be installed within the rights-of-way of existing roadways. Based on these considerations, construction of the Palomar Energy Project would not result in significant impacts on adopted environmental plans or goals of the community, or to disruption or division of the physical arrangement of the community.

Project construction will not result in substantial growth and will not displace people. Because of the short-term nature of PEP construction and the labor force that exists in the area, staff does not expect that the construction work force would contribute to substantial urban growth.

Operational Impacts

Project operations would not result in substantial growth and will not displace people. The PEP will have a small operating workforce of 20 people, and thus produce minimal additional traffic volumes. The site is considered an in-fill project and the City of Escondido General Plan considered the growth impacts of industrial development when the area was designated for industrial uses. The siting of the project is therefore consistent with the General Plan. The industrial designation of the site vicinity is intended, in part, to identify areas appropriate for industrial development that will not cause land use conflicts with surrounding uses. Because of the small workforce, the project will have no significant land use impacts. Impacts related to noise, air quality, biological resources, and cultural resources are addressed in their respective sections.

Cumulative Impacts

Upon review of the project site in conjunction with other planned developments within the SPA, it is staff's opinion that, due to the industrial nature of the proposed ERTCSP, the proposed PEP in conjunction with other developments within the SPA would not result in cumulative land use compatibility impacts. Upon review of other projects in the City, it appears that the projects located within the City of Escondido are not proposing land use changes from the existing General Plan. The majority of the projects are in-fill projects and therefore would not have cumulative land use impacts (Brindle 2001).

The proposed project is not expected to make a significant contribution to regional impacts related to new development and growth, such as population in-migration, the

resultant increased demand for public services, and expansion of public infrastructure such as water pipelines to serve residential development.

ENVIRONMENTAL JUSTICE

Energy Commission staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed PEP (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters of minority population. Because Census 2000 information on poverty status is not yet available at the block level, staff reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because of existing pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for land use.

Based on the land use analysis, staff has not identified significant direct, disproportionate, or cumulative land use impacts resulting from the construction or operation of the project, and therefore there are no land use environmental justice issues related to this project.

FACILITY CLOSURE

At some point in the future, the proposed facility would cease operation and close down. At that time, it would be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The planned lifetime of the PEP is estimated at 30 years. At least 12 months prior to the initiation of decommissioning, the applicant would prepare a Facility Closure Plan for Energy Commission review and approval. This review and approval process would be public and allow participation by interested parties and other regulatory agencies. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning, restoration, and remediation activities with these LORS. All of these activities would fall under the authority of the Energy Commission.

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

CONCLUSIONS

1. If the ERTCSP is adopted as currently drafted, staff concludes that construction and operation of the PEP would be consistent with the applicable LORS of the City of Escondido.

2. The project would not disrupt or divide the physical arrangement of an established community. The Palomar Energy Project would be located within a designated Specific Plan Area.

3. The project would not preclude or unduly restrict existing or planned land uses and would be compatible with the surrounding existing residential uses, park, and school. The project would not preclude or unduly restrict the conducting of agricultural land uses on neighboring properties.

4. With mitigation, operation of the project would not cause any significant impacts to nearby land uses, nor would the operation of the PEP contribute substantially to any cumulative land use impacts.

5. Staff has concluded that the project is compatible with existing and planned land uses in the vicinity of the site.

PROPOSED CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall comply with the design and performance standards for Planning Area 1 as set forth in the City of Escondido Research and Technology Center Specific Plan.

Verification: At least 30 days prior to construction of the PEP, the project owner shall submit written evidence to the CPM that the project conforms to all applicable design and performance standards for Planning Area 1 as set forth in the City of Escondido Research and Technology Center Specific Plan. The submittal to the CPM shall include evidence of review and comment by the City of Escondido.

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LAND USE

Amanda Stennick

INTRODUCTION

This land use analysis of the Palomar Energy Project (PEP) 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 will be incompatible with existing and planned land uses if they create unmitigated noise, dust, health hazard, traffic, or visual impacts, or when they unduly restrict existing or planned future uses.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section describes federal, state, regional, and local land use laws, ordinances, regulations, or standards (LORS) applicable to the proposed project.

FEDERAL

There are no specific federal LORS associated with land use that apply to the project.

STATE

There are no specific state LORS associated with land use that apply to the project.

LOCAL

City of Escondido General Plan

State law requires that each city and/or county prepare and adopt a comprehensive General Plan for the physical development of the city or county. The General Plan must be internally consistent, and it must contain implementation measures to ensure its compliance.

There are seven mandated elements that must, by state law, be included in the General Plan: land use, circulation, housing, conservation, open space, noise and safety. The state also permits jurisdictions to adopt other elements, including but not limited to recreation, public services, scenic highways and historic preservation. California Government Code section 65302(a) mandates a land use element designating the proposed general distribution, general location, and extent of uses of the land. These state requirements are implemented through the Escondido General Plan and the Escondido Zoning Ordinance.

The City Council adopted the Escondido General Plan in June 1990 to guide the development and use of private and public lands within the community's boundaries. The Escondido General Plan Land Use Element designates the PEP site as Light Industrial. The Light Industrial land use designation provides for manufacturing, warehousing/distribution, assembling, and wholesaling (Escondido General Plan).

Goals and Objectives

The City has adopted a set of community goals and objectives as part of the General Plan. They provide the framework for establishing policies, standards, and guidelines for future growth in the City. The following Escondido General Plan goals are applicable to the PEP.

Goal 5: Encourage more high-quality industrial, retail, manufacturing, and service-oriented businesses that create and maintain a strong economic base and provide an environment for the full employment of a diverse set of skills.

A key objective of this goal, as it relates to the industrial sector, is to "value high technology, research and development, and various industrial uses as important integral parts of a sustainable economic base."

Goal 8: Preserve Escondido's natural and scenic resources

Relevant objectives of this goal are to "participate in efforts to attain state and federal air quality standards" and "to protect existing terrain, steep slopes, floodways, habitat areas and ridge lines, and to minimize visual impacts."

Goal 11: Provide a safe and healthy environment for Escondido residents

Relevant objectives include grading, drainage, and erosion control standards that "control surface runoff associated with new development while preserving natural resources," and "participate in local and regional programs to meet state and federal air quality standards."

Escondido Zoning Ordinance

While the General Plan designates the PEP site as Light Industrial, the site is zoned Specific Plan (SP) by the Escondido Zoning Code. Zoning Ordinance Article 18 Specific Plan (SP) Zone, section 33-393 specifies that permitted uses within the SP zone shall be fully defined through the adoption of a specific plan. General direction for permitted uses shall be established by the existing general plan designations. In addition, where the SP zone implements the "Specific Planning Area" (SPA) General Plan Overlay designation, permitted land uses shall be established in accordance with the policy direction provided in the Land Use Element text of the General Plan for that particular SPA. Zoning Ordinance Article 18 Specific Plan (SP) Zone, section 22-392 Development Regulations indicates that development standards for property zoned SP shall be established by a SP which shall be prepared and adopted pursuant to section 65450 of the Government Code. No property zoned SP can be developed without the adoption of a Specific Plan (Escondido Zoning Ordinance).

Escondido Research and Technology Center Specific Plan

The PEP site is also located within a Specific Plan (SP) land use and zoning designation, as identified by the Escondido General Plan and Zoning Ordinance. As stated in the Escondido General Plan Specific Planning Area Policy B7.1, Specific

Planning Areas (SPAs) are intended for areas which require submittal of specific plans prior to development, as described in Government Code sections 65450 through 65507.

The PEP site is part of what is currently designated by the General Plan as Specific Planning Area No. 8. Specific Planning Area No. 8, known as the Harmony Grove Specific Planning Area, or Quail Hills, was anticipated in the General Plan to be developed into "a high-quality industrial park, encouraging clean industrial uses to expand Escondido's industrial and employment base."

The Escondido Research and Technology Center Specific Plan (ERTCSP) currently under review by the City of Escondido, proposes to amend and supersede the Quail Hills Specific Plan, which was adopted in January 1988. The City of Escondido expects to adopt the ERTCSP in October 2002. If adopted, the ERTCSP will provide for orderly and coordinated development of the overall 208-acre ERTC property consistent with Section 65451 of the California Government Code and Article 18 of the City of Escondido Zoning Ordinance. The ERTCSP is a comprehensive zoning document which regulates development of the specialized industrial and office uses which will be included within the proposed project area (ERTCSP 2001). The proposed PEP would be a component of the proposed ERTC.

SETTING

SITE AND VICINITY DESCRIPTION

The PEP site is located within the northeast portion of the ERTCSP in the western portion of the City of Escondido. The ERTCSP encompasses approximately 208 acres, within which the PEP site is designated as Planning Area 1. Planning Area 1 consists of 20 gross acres.

The ERTCSP is located in a region of rapid urban growth, with industrial development occurring to the north and east. Land use in the project vicinity also includes commercial and residential development. The PEP site is essentially vacant and is bounded directly to the north by a vacant lot, on the east by existing industrial land uses, on the south by future industrial land uses within the SPA, and on the west by the existing San Diego Gas & Electric (SDG&E) 200-foot wide transmission corridor and future industrial land uses within the SPA. Significant portions of the ERTCSP, including the PEP site, have been disturbed by off-road vehicle activities and grading. A 200-foot-wide electrical transmission easement with steel lattice towers runs north-south through the center of the site. Numerous other utility easements, dirt roads, and trails traverse the site.

The site also has remnants of former agricultural uses. Specifically, the 20-acre PEP site includes a central graded area at an existing elevation of approximately 790 feet above mean sea level (msl), a largely cleared slope formerly used for agriculture located to the north of the graded area, and naturally vegetated slopes to the south of the graded area (ERTCSP 2001).

The PEP site contains approximately six acres of land classified as Farmland of Local Importance by the California Department of Conservation (DOC) of the California Resources Agency. The DOC had previously classified this land as Unique Farmland. No farming is occurring on this six-acre portion of the site, which contains the remnants of an abandoned avocado orchard.

Regional access to the PEP site is from State Route 78 (SR-78) and Interstate 15 (I-15). Local access is via the Nordahl Drive exit off SR-78, via the future Citracado Parkway, and the Ninth Avenue and Valley Parkway exits off I-15 to Vineyard Avenue from the southeast. The future Citracado Parkway is proposed as a "Major Road," and it will bisect the SPA traveling from north to south. Other streets in the area include Enterprise Street and Andreasen Drive, which serve the existing industrial park to the east, and Harmony Grove Road, which provides access from the south.

General Plan Designations and Zoning

The following section discusses the City of Escondido's land use designations, zoning, and land uses within one mile of the proposed PEP site.

North: General Plan land use designations to the north of the site are GI (General Industrial), LI (Light Industrial), E (Estate), and SP (Specific Plan). Zoning is M-1 (Light Industrial), M-2 (General Industrial), RE-20 (Residential Estates), and S-P (Specific Planning Area).

East: General Plan land use designations to the east of the site are GI (General Industrial), LI (Light Industrial), PC (Planned Commercial), and U (Urban). Zoning is M-1 (Light Industrial), M-2 (General Industrial), IP (Industrial Park), PD-C (Planned Development –Commercial), CG (General Commercial), R-1-6 (Single Family Residential), R-1-7 (Single Family Residential), PD-R (Planned Development – Residential), R-2-11 (Light Multiple Residential), and R-2-8 (Light Multiple Residential).

South: General Plan land use designations to the south of the site are SP (Specific Plan), E (Estate), U (Urban), and R(Rural). Zoning is S-P (Specific Planning Area), and RE-20 (Residential Estates).

West: General Plan land use designations to the west of the site are SP (Specific Plan), and E (Estate). Zoning is S-P (Specific Planning Area) and RE-20 (Residential Estates).

Surrounding Land Uses

As indicated by General Plan designations and zoning, lands within one mile of the PEP site are dominated by existing and planned urban and industrial uses. This urban landscape continues for several miles towards the center of the City of Escondido. The most notable urban feature in the project vicinity is the I-15/SR 78 interchange to the northeast. The areas to the north and northwest are also dominated by urban land uses. Property to the south is generally vacant, with sporadic single-family homes on large lots.

While industrial parks and other heavily urbanized landscapes occupy the area immediately to the east of the SPA, residences are interspersed within a one-mile

radius of the PEP site. Multi-family residential development is located in the southern portion of the study area, with the nearest residence being located approximately 2,800 feet from the PEP site. Residential development also exists directly west of the SPA. The closest residence to the site is located approximately 1,850 feet from the site. Further west of the SPA is vacant unincorporated County of San Diego land; however, it is currently designated and zoned for rural and large-lot residential development.

Existing land uses in the study area are primarily industrial; however two schools and one park are located at the edge of the one-mile radius. According to Section 5 of the General Plan, Community Open Space/Conservation, there are no prime agricultural lands within the study area.

AGRICULTURAL USES

As noted in the **SITE AND VICINITY** discussion, the PEP site contains about six acres of Farmland of Local Importance. Section 5.6 of the Application for Certification (AFC) states that the northern portion of the PEP site contains six acres of Unique Farmland, as shown in AFC Figure 5.6-1, and on the DOC's 1998 Important Farmland map for San Diego County (Palomar 2001a). Unique Farmland is considered a significant resource under the California Environmental Quality Act (CEQA).

In recent field visits to the site, staff has observed that the northern portion contains a number of tree stumps and a few abandoned avocado trees, which are the remnants of an avocado orchard. If the site contained an actively farmed avocado orchard, it would qualify for the Unique Farmland designation. However, since 1998, the DOC staff has updated the Important Farmland map to reflect the removal of most of the trees and the overall lack of farming. The map updating process has resulted in DOC downgrading the northern portion of the PEP site and the ERTC site to Farmland of Local Importance, which is not a significant resource under CEQA (DOC 2000). The PEP's conversion of six acres of Farmland of Local Importance is not a significant impact.

PLANNED LAND USES - ERTCSP

The ERTCSP, currently under review has been proposed to amend and supersede the Quail Hills Specific Plan. The ERTCSP encompasses approximately 208 acres including the Palomar Energy site. Of the 208 acres within the ERTCSP, approximately 186 acres are designated for industrial and urban uses, and the remaining 22 acres are proposed for residential development (ERTCSP 2001). The City of Escondido prepared a Notice of Preparation (NOP) on the project in December 2001, and the 2002 Draft Environmental Impact Report (DEIR) on the ERTCSP is currently under review by the City, Energy Commission staff, and other responsible agencies. The City of Escondido expects to adopt the ERTCSP in October 2002.

The ERTCSP will provide for orderly and coordinated development of the overall 208-acre business park property consistent with section 65451 of the Government Code and Article 18 of the City of Escondido Zoning Ordinance. The site and general surrounding area have been designated Light Industrial since adoption of the General Plan. The purpose of this designation is to provide sites for light industrial firms engaged in processing, assembling, manufacturing, warehousing and storage, research and

development, as well as for incidental service facilities and public facilities to serve the manufacturing area.

IMPACTS

THRESHOLDS OF SIGNIFICANCE

Significance criteria are based on the CEQA Guidelines, the CEQA Environmental Checklist Form (adopted January 1, 1999), and on performance standards or thresholds adopted by responsible agencies. An impact may be considered significant if the project results in:

- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- disruption or division of the physical arrangement of the established community;
- conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural uses.

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

A project may also have a significant impact on land use, in terms of environmental justice, if it would create significant unmitigated disproportionate impacts in an area with a population consisting of at least 50 percent minority or low-income residents.

PROJECT FEATURES

Sempra Energy Resources intends to develop the proposed PEP under the Alternative B use program for Planning Area 1 in the ERTCSP. Alternative B allows for an electrical power generating facility.

LINEAR FACILITIES

The PEP will be fueled with natural gas delivered via an (SDG&E) gas system. An existing 16-inch SDG&E natural gas pipeline, located immediately adjacent to the northeast corner of the project site at the end of Enterprise Street, has sufficient capacity to serve the project. However, SDG&E proposes to construct an upgrade consisting of approximately 2,600 feet of 16-inch pipeline in order to alleviate an existing deficiency in the gas system.

The City of Escondido Hale Avenue Resource Recovery Facility (HARRF) will supply reclaimed water for the project. Reclaimed water to the site will be conveyed via a new 1.1-mile, 16-inch supply pipeline extending from a connection point located on Harmony Grove Road. From this connection point, the pipeline will extend northwest along Harmony Grove Road to the existing transmission corridor located within the SPA, and

north either along the SDG&E transmission corridor or along the Citracado Parkway to the project site. The reclaimed water line will be underground for its entire length.

A new 1.1-mile, 8-inch return pipeline routed alongside the reclaimed water supply pipeline will be constructed to facilitate the transport of brine from the project to the City of Escondido HARRF. The brine return pipeline will connect to an existing City of Escondido brine return line. This line also will be underground.

Except for the segment of the water supply and brine return pipeline route that traverses the ERTC industrial park property, the pipelines all will be installed within the rights-of-way of existing roadways (Palomar 2001a).

CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the [Energy] commission determines that such a facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity. In making the determination, the commission shall consider the entire record of the proceeding, including, but not limited to the impacts of the facility on the environment, consumer benefits, and electric system reliability." In no event shall the Commission make any finding in conflict with applicable federal law or regulation.

When determining if a project is in conformance with state, local or regional ordinances or regulations, the Energy Commission typically meets and consults with applicable agencies to determine conformity (Pub. Resources Code 25523(d)(1)). The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the project is consistent or at variance with each requirement or standard.

City of Escondido General Plan

Staff has reviewed the relevant goals and objectives of the Escondido General Plan, and has concluded that the Palomar Energy Project, including its linear facilities, is consistent with the General Plan, specifically Goal 5, "Encourage more high-quality industrial, retail, manufacturing, and service-oriented business that create and maintain a strong economic base and provide an environment for the full employment of a diverse set of skills." The project would assist in meeting the City's General Plan goal for this area. Development would not conflict with applicable environmental plans or policies, nor affect agricultural resources or operations, and would not disrupt or divide the physical arrangement of an established community. Impacts would be less than significant.

Escondido Research and Technology Center Specific Plan

The ERTCSP creates the regulatory processing and implementation framework to allow the PEP project (and the larger business park where it is situated) to develop. The PEP site is part of what is currently designated by the General Plan as Specific Planning Area No. 8. Specific Planning Area No. 8, known as the Harmony Grove Specific

Planning Area, or Quail Hills, was anticipated in the General Plan to be developed into a high-quality industrial park, encouraging clean industrial uses to expand Escondido's industrial and employment base.

The City of Escondido's Regulatory Procedure Under CEQA

The City of Escondido adopted the Quail Hills Specific Plan in January 1988, by Resolution 88-126. As indicated in the Quail Hills Specific Plan, land use designations within the project area were intended to include areas devoted to General Industrial, a Mixed-Use Activity Center, Business Commercial, and offices. The ERTCSP, which is currently under review, proposes to amend and supersede the Quail Hills Specific Plan.

As lead agency under CEQA, the City of Escondido has prepared a NOP and DEIR on the ERTCSP. The NOP was reviewed by the following agencies, which have approval authority over some aspect of the project: United States Army Corps of Engineers; United States Fish and Wildlife Service; California Department of Fish and Game; Regional Water Quality Control Board; Federal Communication Commission; Federal Energy Regulatory Commission; and the San Diego County Local Agency Formation Commission. Energy Commission staff also reviewed the NOP. The DEIR is currently being circulated to responsible agencies for review and comment.

In addition to the ERTCSP, the proposed ERTC business park will require the City to amend the Circulation Element and the Land Use Element of their General Plan, and review the Tentative Subdivision Map for approval in accordance with the State Subdivision Map Act, and the City of Escondido Subdivision Ordinance. All planning documents requiring environmental review under CEQA are being reviewed for approval concurrently with the ERTCSP by the City of Escondido. The City expects to have Planning Commission adoption of the ERTCSP, General Plan amendments, and Tentative Subdivision Map in late October (Delgadillo 2002). Energy Commission staff will then use the City of Escondido's Final Environmental Impact Report on the ERTCSP as part of our environmental analysis of the proposed PEP.

ERTCSP Components

As indicated previously, the PEP site is designated as Planning Area 1 within the draft ERTCSP, currently under City review. Chapter II of the ERTCSP provides a set of comprehensive policies and standards to govern various aspects of development within the SPA. It identifies land use, circulation, design, and planning area policies and general architectural and landscape standards for the overall 208-acre SPA to ensure community compatibility, adequacy of access, parking, landscaping and other features which are characteristic of a quality development.

Chapter III of the ERTCSP translates the policies and standards identified in Chapter II into use categories, design and development standards for each planning area. The following describes permitted uses, design and development standards for Planning Area 1 as identified in Chapter III of the ERTCSP.

ERTCSP Planning Area 1 Permitted Uses

According to Chapter III of the ERTCSP, two alternative permitted use programs are designated for Planning Area 1. Alternative A would allow for light industrial type uses,

while Alternative B would allow for the PEP. According to the ERTCSP, Alternative B would consist of a nominal 550-megawatt power generation facility to be fueled exclusively with natural gas. Support services for the power generation facility, including employee cafeteria, employee recreational facilities, storage buildings, or auditorium accessory with and incidental to a permitted use (intended primarily for the express use of those persons employed at the firm or use where such incidental use is applied). Accessory uses and structures are acceptable when related and incidental to a permitted use such as, but not limited to, food preparation, food service and eating facilities.

According to the ERTCSP, selection of Alternative A versus Alternative B shall be at the sole discretion of the developer. The PEP project is consistent with the permitted uses as described under the Alternative B permitted use program for Planning Area 1 of the ERTCSP.

Access

According to Chapter III of the ERTCSP, one location of primary private ingress and egress from the planned Citracado Parkway shall be paved to a minimum width of 30-foot apron with a 28-foot minimum driveway. A divider island may be provided to separate lanes. A second location of secondary, emergency ingress and egress from Citracado Parkway shall be paved to a minimum width of 22-foot apron with a 20-foot minimum driveway width.

Lot Size

According to Chapter III of the ERTCSP, under Alternative B, Planning Area 1 shall not be additionally subdivided beyond the Master Tentative Map subdivision.

Building Coverage

According to Chapter III of the ERTCSP, buildings may cover any area not required by this specific plan for setbacks, landscaping, or parking.

Building Height

Planning Area 1 is a significantly excavated area allowing extensive use of topography to provide visual screening of the structures.

For Alternative A, the maximum building height of the operations building shall be 60 feet from the finished floor elevation of the approved site plan, measured to the top of the parapet. Parapets extended to form tower or signage elements, architectural monuments and features, rooftop equipment and screening shall be allowed to extend 10 feet above the 60-foot building height.

In the event Planning Area 1 is developed pursuant to Alternative B, the height limitation specified for Alternative A shall be applied to the operations building only, and the maximum height of exhaust stacks shall be 120 feet above the finished floor elevation.

Building Setbacks

The following building setbacks for structures located within Planning Area 1 have been identified in Chapter III of the ERTCSP:

a. Front Yard – No building or structure shall be located less than 200 feet from the right of way line of Citracado Parkway.

b. Side Yard – Every lot and building shall maintain a side yard of not less than 10 feet of fully landscaped area on each side.

c. Rear Yard – 10-foot minimum.

d. Parking shall be located no closer than 200 feet measured from the right of way line of Citracado Parkway.

Parking

According to Chapter III of the ERTCSP, parking spaces shall be provided at the ratio of 2.0 spaces per 1,000 square feet of occupied gross floor area.

Architectural Standards

As indicated in the ERTCSP, the design of the power generating facility equipment structures, by virtue of their relatively small area coverage and isolated position within the overall plan can support more varied and functional architecture. The side of the operations building which is nearest to and facing the site perimeter shall conform to the Comprehensive Policies and Design Guidelines set forth in Chapter II of this specific plan.

Landscaping Requirements

The following landscaping requirements identified in the ERTCSP relate to Planning Area 1:

a. A dense landscape screen of trees and screening shrubs shall be planted and maintained along the property and planning area boundary lines except for the area required for street access. The depth of the landscaping shall be a minimum of 10 feet on all sides. All landscape planters shall be provided with permanent watering facilities. Landscaping shall not obstruct vehicular or pedestrian sight lines.

b. One 15-gallon tree shall be planted per every six parking spaces within parking areas. Tree location and design shall be per City of Escondido Landscape Standards.

c. A permanent underground irrigation system will maintain all plantings.

d. The utility easement shall be restored to natural upland habitat and receive temporary irrigation, except near Vineyard Avenue where entry monumentation and ornamental plantings will occur.

Lighting

All proposed lighting shall be in conformance with the requirements of Chapter II, Section K of the ERTCSP. Outdoor lighting used after 11:00 P.M. for security purposes to illuminate equipment yards, streets or roadways (public or private), parking lots, and similar facilities shall be illuminated by shielded low pressure sodium lighting fixtures only. In addition, the ERTCSP indicates that the requirements of Chapter II shall be adapted to address design issues particular to a power generating facility.

Walls/Fencing

According to the ERTCSP, the perimeter of Planning Area 1 shall be secured with aesthetic steel fencing or screen walls, selected as appropriate for specific visual settings along the perimeter. Access to the site(s) shall be restricted to specific entries, and gate guarded entries axe allowed. Fencing internal to the site may be galvanized steel chain link security fencing.

Loading Areas

According to the ERTCSP, the location of loading areas shall be screened from view from Citracado Parkway. Design of the loading/unloading areas shall not restrict on-site circulation, fire lane, or parking and shall include a ten (10) foot high solid wall at the loading ramp.

Summary – Consistency with ERTCSP

As described above, the proposed land uses within the ERTCSP are consistent with the City's General Plan. Implementation of the proposed project would not conflict with the proposed ERTCSP, as the PEP is consistent with the permitted land use as described as Alternative B Land Use Program identified for Planning Area 1. Development of the PEP would not result in a subdivision of Planning Area 1 beyond the Master Tentative Map subdivision; therefore, the PEP would be consistent with this standard. The PEP, as proposed, also would be consistent with the design guidelines and development standards identified for Planning Area 1, including height limitations for the PEP operations building and stacks. Given the expected PEP operation workforce of 20 people, the planned parking area will be sufficient. Energy Commission staff finds that once the ERTCSP is adopted by the City of Escondido, the proposed PEP would be in conformance with the design guidelines and development standards contained therein. Thus, impacts would be less than significant.

Escondido Zoning Ordinance

Staff has reviewed the relevant sections of the Zoning Ordinance. The Zoning Ordinance requires that permitted uses and development standards within an S-P zone shall be fully defined through the adoption of a specific plan. The ERTCSP will amend and supersede the existing Quail Hills Specific Plan (which includes the project site) that was adopted by the City of Escondido in January 1988, by adoption of Resolution 88-126. Development of the PEP and linear facilities would be consistent with the permitted uses, development standards, and design guidelines as identified in the ERTCSP and therefore, with adoption of that plan, the proposed project would not conflict with the Escondido Zoning Ordinance.

Except for the segment of the water supply and brine return pipeline route that traverses the ERTC industrial park property, the pipelines all will be installed within the rights-of-way of existing roadways. The Zoning Ordinance allows underground pipelines in all zones.

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

Construction Impacts

Construction impacts of the PEP will be temporary and are expected to last approximately 21 months. The major construction activities will occur on-site and will not disrupt or divide surrounding land uses. The power plant project's linear facilities (predominantly offsite) will also have no significant land use impacts. The water supply, brine return, and natural gas pipelines all will be installed below ground. Except for the segment of the water supply and brine return pipeline route that traverses the ERTC industrial park property, the various pipelines all will be installed within the rights-of-way of existing roadways. Based on these considerations, construction of the Palomar Energy Project would not result in significant impacts on adopted environmental plans or goals of the community, or to disruption or division of the physical arrangement of the community.

Project construction will not result in substantial growth and will not displace people. Because of the short-term nature of PEP construction and the labor force that exists in the area, staff does not expect that the construction work force would contribute to substantial urban growth.

Operational Impacts

Project operations would not result in substantial growth and will not displace people. The PEP will have a small operating workforce of 20 people, and thus produce minimal additional traffic volumes. The site is considered an in-fill project and the City of Escondido General Plan considered the growth impacts of industrial development when the area was designated for industrial uses. The siting of the project is therefore consistent with the General Plan. The industrial designation of the site vicinity is intended, in part, to identify areas appropriate for industrial development that will not cause land use conflicts with surrounding uses. Because of the small workforce, the project will have no significant land use impacts. Impacts related to noise, air quality, biological resources, and cultural resources are addressed in their respective sections.

Cumulative Impacts

Upon review of the project site in conjunction with other planned developments within the SPA, it is staff's opinion that, due to the industrial nature of the proposed ERTCSP, the proposed PEP in conjunction with other developments within the SPA would not result in cumulative land use compatibility impacts. Upon review of other projects in the City, it appears that the projects located within the City of Escondido are not proposing land use changes from the existing General Plan. The majority of the projects are in-fill projects and therefore would not have cumulative land use impacts (Brindle 2001).

The proposed project is not expected to make a significant contribution to regional impacts related to new development and growth, such as population in-migration, the

resultant increased demand for public services, and expansion of public infrastructure such as water pipelines to serve residential development.

ENVIRONMENTAL JUSTICE

Energy Commission staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed PEP (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters of minority population. Because Census 2000 information on poverty status is not yet available at the block level, staff reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because of existing pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for land use.

Based on the land use analysis, staff has not identified significant direct, disproportionate, or cumulative land use impacts resulting from the construction or operation of the project, and therefore there are no land use environmental justice issues related to this project.

FACILITY CLOSURE

At some point in the future, the proposed facility would cease operation and close down. At that time, it would be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The planned lifetime of the PEP is estimated at 30 years. At least 12 months prior to the initiation of decommissioning, the applicant would prepare a Facility Closure Plan for Energy Commission review and approval. This review and approval process would be public and allow participation by interested parties and other regulatory agencies. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning, restoration, and remediation activities with these LORS. All of these activities would fall under the authority of the Energy Commission.

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

CONCLUSIONS

1. If the ERTCSP is adopted as currently drafted, staff concludes that construction and operation of the PEP would be consistent with the applicable LORS of the City of Escondido.

2. The project would not disrupt or divide the physical arrangement of an established community. The Palomar Energy Project would be located within a designated Specific Plan Area.

3. The project would not preclude or unduly restrict existing or planned land uses and would be compatible with the surrounding existing residential uses, park, and school. The project would not preclude or unduly restrict the conducting of agricultural land uses on neighboring properties.

4. With mitigation, operation of the project would not cause any significant impacts to nearby land uses, nor would the operation of the PEP contribute substantially to any cumulative land use impacts.

5. Staff has concluded that the project is compatible with existing and planned land uses in the vicinity of the site.

PROPOSED CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall comply with the design and performance standards for Planning Area 1 as set forth in the City of Escondido Research and Technology Center Specific Plan.

Verification: At least 30 days prior to construction of the PEP, the project owner shall submit written evidence to the CPM that the project conforms to all applicable design and performance standards for Planning Area 1 as set forth in the City of Escondido Research and Technology Center Specific Plan. The submittal to the CPM shall include evidence of review and comment by the City of Escondido.

REFERENCES

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NOISE AND VIBRATION

Jim Buntin

INTRODUCTION

The construction and operation of any power plant creates noise or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction practices, such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the Palomar Energy Project (PEP), and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS). For an explanation of technical terms employed in this testimony, please refer to **NOISE Appendix A** immediately following.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time to which the worker is exposed (see **NOISE Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

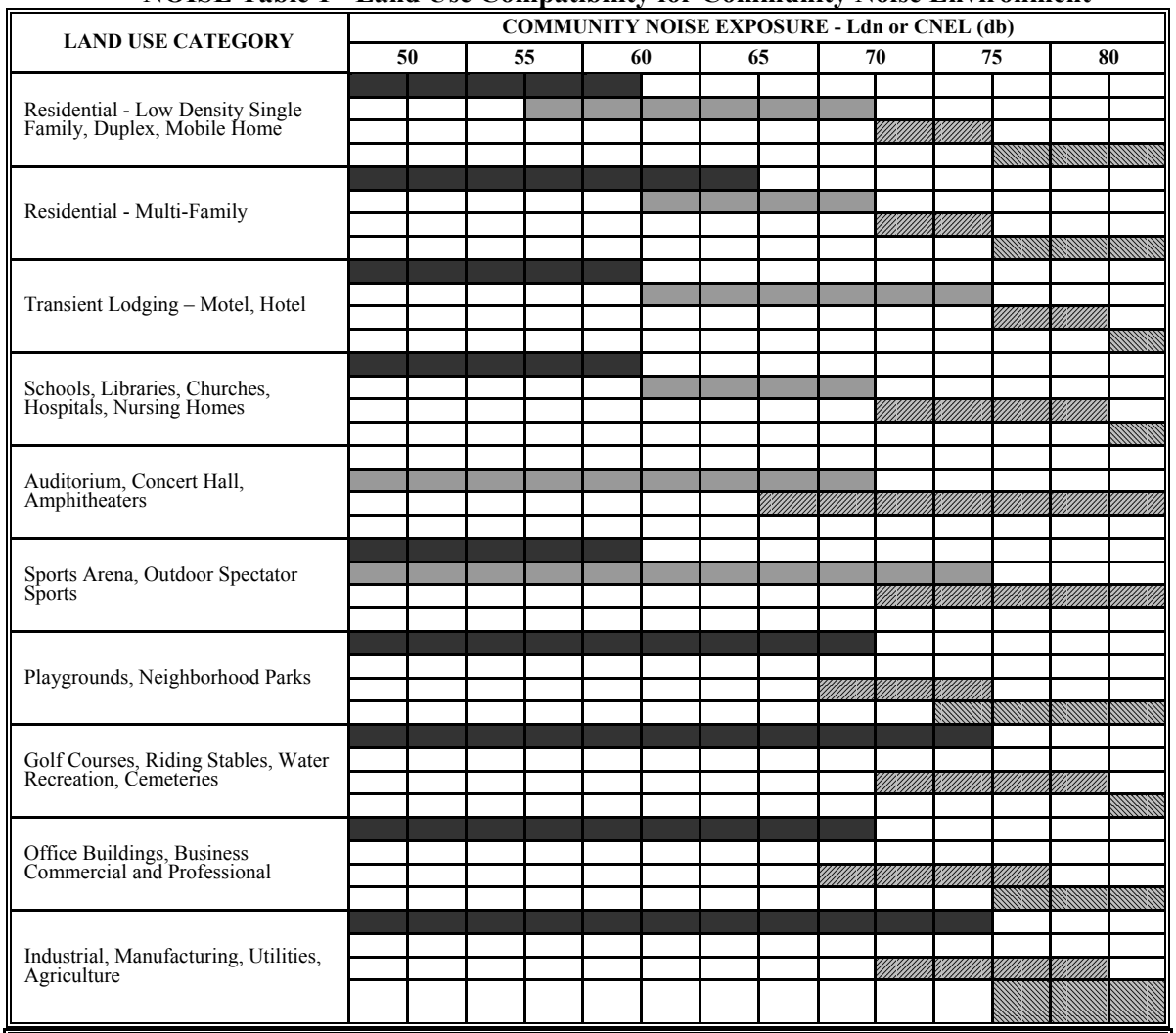
There are no federal laws governing off-site (community) noise.

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code section 65302(f) encourages each local governmental entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in **NOISE Table 1**.

NOISE Table 1 - Land Use Compatibility for Community Noise Environment



	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence

of local noise standards. The Model also contains a definition of a simple tone, or "pure tone," in terms of one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by five dBA.

Other State LORS include the California Environmental Quality Act (CEQA) and the 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. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

a) exposure of persons to, or generation of, noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

b) exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

c) a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

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

The Energy Commission staff, in applying item c) above to the analysis of this and other projects, has concluded that a potential for a significant noise impact exists where the noise of the project plus the background exceeds the background by five dBA L_{90} or more at the nearest sensitive receptor.

Staff considers it reasonable to assume that an increase in background noise levels up to 5 dBA in a residential setting is insignificant; an increase of more than 10 dBA is clearly significant. An increase between 5 and 10 dBA should be considered adverse, but may be either significant or insignificant, depending on the particular circumstances of a case.

Factors to be considered in determining the significance of an adverse impact as defined above include:

1. the resulting noise level[1];
2. the duration and frequency of the noise;
3. the number of people affected;
4. the land use designation of the affected receptor sites;
5. public reactions or controversy as demonstrated at workshops or hearings, or by correspondence; and
6. prior CEQA determinations by other agencies specific to the project.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

1. the construction activity is temporary;
2. use of heavy equipment and noisy activities is limited to daytime hours; and
3. all industry-standard noise abatement measures are implemented for noise-producing equipment.

Cal-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards (**see NOISE Appendix A, Table A4**).

LOCAL

City of Escondido General Plan Community Protection and Safety Element

The Community Protection and Safety Element of the City of Escondido General Plan contains provisions and policies that are intended to minimize noise impacts to the community. Policy E1.2 of this Element states that the goal for outdoor noise levels in residential areas is 60 dB CNEL. Policy E1.4 states that the City shall enforce its noise ordinance to protect the noise environment in residential areas.

City of Escondido Municipal Code

The City of Escondido has adopted specific noise standards for stationary sources in Article XI, Sections 17-226 through 17-260 of the Municipal Code. The maximum permissible noise levels are described by **NOISE Table 2**.

[1] For example, a noise level of 40 dBA would be considered quiet in many locations. A noise limit of 40 dBA would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments, and with industrial noise regulations adopted by European jurisdictions. If the project would create an increase in ambient noise no greater than 10 dBA at nearby sensitive receptors, and the resulting noise level would be 40 dBA or less, the project noise level would likely be insignificant.

NOISE Table 2 – City of Escondido Noise Standards

Zone	Time	Hourly Leq Limit, dBA
Residential	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
Multi-Residential	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
Commercial	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
Light Industrial	Anytime	70
General Industrial	Anytime	75

Each of the above standards is reduced by 10 dBA when applied to a steady audible sound such as a whine, screech, or hum, or to sound that contains a repetitive impulsive noise.

Sound levels may be measured at the property line of the receiving land use, or at any point within the boundary of the affected property.

Construction noise due to grading, compacting, drilling, rock crushing, bulldozing, clearing, digging, filling and blasting is exempt from the above noise standards between the hours of 7:00 a.m. to 6:00 p.m. on weekdays, and 10:00 a.m. to 5:00 p.m. on Saturdays. The equipment used for these activities may not be operated so as to exceed a one hour average sound level limit of 75 dBA at any time when measured at or within the property lines of a residential use.

Section 33-570(1) of the Zoning Regulations stipulates that no vibration which causes a public nuisance shall be discernable at the property line of the parcel in which the vibration-producing activity is located.

SETTING

PROJECT BACKGROUND

The Palomar Energy Project (PEP) involves the construction and operation of a 500 megawatt (MW) power plant, which is proposed to be located in a business park in the City of Escondido.

The new units would consist of two natural gas combustion turbines with heat recovery steam generators, and a condensing steam turbine. The PEP would have a 230 kV switchyard, and would connect to the SDG&E substation using a new 0.5 mile-long 230 kV transmission line.

The equipment that has the greatest potential to generate significant noise levels includes the gas turbines, steam turbine generator, pumps, motors, main transformers, and a wet cooling tower. No pile driving is planned. During development of the project site, blasting would have the potential to produce significant ground-borne vibration levels.

Power Plant Site

This site is located within the City of Escondido in San Diego County. Land uses in the project vicinity include residential and industrial developments.

The PEP would be constructed on currently vacant land, in a newly-developed business park, the Escondido Research and Technology Center (ERTC). The nearest noise sensitive uses are homes located south and southwest of the project site, and a mobile home park located east of the site.

Escondido Research and Technology Center Review

The ERTC project and a draft Specific Plan for the ERTC are currently undergoing a CEQA review, with the City of Escondido (City) as Lead Agency. The City released a Draft Environmental Impact Report (DEIR) on July 26, 2002. The City's Planning Commission and City Council are expected to consider a final EIR for the project in early October. A decision on the ERTC Specific Plan is expected in November.

The City and the Energy Commission staff have executed a Memorandum of Understanding to coordinate the environmental and permitting reviews of the PEP and the ERTC Specific Plan. The ERTC Specific Plan includes modifications necessary for the PEP to comply with local LORS. Because the PEP is physically dependent on the development of the ERTC, the approval of the PEP by the Energy Commission cannot occur until the City completes its EIR process and approves the ERTC Specific Plan.

Linear Facilities

The PEP would include a new 230 kV switchyard connecting with an existing SDG&E electric transmission line located immediately adjacent to the project site.

An existing SDG&E natural gas line is located immediately adjacent to the project site.

Reclaimed water would be supplied via a new, 1.1-mile supply pipeline. Brine would be returned via an adjacent new 1.1-mile pipeline.

EXISTING NOISE LEVELS

In order to predict the likely noise effects of the project on adjacent sensitive receptors, the applicant commissioned ambient noise surveys of the area. The surveys were conducted on April 23-25, and September 24-25, 2001. The noise surveys were conducted using acceptable sound level measurement systems.

The applicant's noise survey monitored existing noise levels at the following four off-site monitoring locations, which are shown by **NOISE Figure 1**:

1. Location 1: Single-family residences along Live Oak Road, Chardonney Way and Allenwood Lane west of the project site, about 1,800 feet distant.
2. Location 2: Single-family residences on elevated lots along Oak View Way southwest of the project site, about 2,300 feet distant.
3. Location 3: Mobile homes located along Via Chardonnay southeast of the project site, about 2,800 feet distant.

4. Location 4: Industrial land uses adjacent to the east project site boundary.

NOISE Table 3 summarizes the ambient noise measurement results (Palomar 2001a, AFC § 5.9.1.1).

NOISE Table 3: Summary of Measured Noise Levels

Measurement Sites	Measured Noise Levels, dBA		
	Average During Quietest Nighttime Hours		Community Noise Equivalent Level (CNEL)
	L_{eq}	L_{90}	
1 – Live Oak Area	43	34	53*
2 – Oak View Way	45	36	57*
3 – Mobile Homes	51	40	58*
4 – Industrial Area	53	44	61*
*Energy Commission staff calculation			

Two other power plants are located near the project site, the RAMCO and CalPeak peaking plants. Although these facilities were not in operation at the time of the noise survey, the applicant estimated the noise exposures due to their operation from the noise level data contained in the CalPeak AFC. The applicant's worst-case noise level projection for the combined operation of the two peaking power plants is a cumulative noise level of 23 dBA at the nearest sensitive receptor.

In general, the noise environment in the immediate vicinity of the existing plant can be described as moderately quiet in residential areas, especially at night.

The noise environment in the immediate vicinity of the project site is dominated by noise from local and distant traffic, and from industrial activities.

Insert **NOISE Figure 1** here.

Use AFC Figure 5.9-1

IMPACTS

Noise impacts associated with the project can be created by short-term construction activities, and by normal long-term operation of the power plant.

PROJECT SPECIFIC IMPACTS — CONSTRUCTION

Community Effects

General Construction Noise

Construction noise is usually considered a temporary phenomenon. Grading of the ERTC site, as well as blasting, would occur before the beginning of PEP construction. The construction of the PEP is expected to occur over a two-year period. Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances. The City of Escondido regulates the permissible hours of construction, and applies specific noise limits during those hours.

The applicant has prepared an analysis of construction noise impacts, listing predicted noise levels due to specific types of equipment and of generalized construction activities. The construction noise analysis results are summarized for the most-affected receptor locations during the busiest periods of construction in **NOISE Table 4**.

NOISE Table 4 - Construction Noise Level Predictions

Location	Distance, feet, from noise sources	Predicted Sound Level, dBA
Site Boundary	245	74
Residences near Site 1	1,800	57
Residences near Site 2	2,300	55
Mobile Home Park	2,800	53

The noise level at the project boundary would comply with the City of Escondido construction noise standard of 75 dBA. The predicted construction sound levels at the above sensitive receptor locations would be within the range of the ambient daytime noise level conditions. The increases would be perceptible during normally quiet hours, and would be of a temporary nature. The unmitigated increases in ambient noise levels due to construction are potentially significant. However, because construction will be restricted to daytime hours by Condition of Certification **NOISE-8**, the noise effect of construction is considered to be insignificant.

The noise levels shown in **NOISE Table 4** do not include the contribution of pile driving, as the applicant has indicated that pile driving will not be needed.

Based upon the potential noise impacts of construction, the Energy Commission staff has recommended the inclusion of three Conditions of Certification (**NOISE-1**, **NOISE-2**,

and **NOISE-8**) to monitor and mitigate potential construction and closure related demolition noise impacts.

Because construction activity and related traffic are regulated by the proposed Conditions of Certification, and are of limited duration, potential construction noise impacts to receptors in the PEP project area (following site development for the ERTC) are considered to be less than significant.

Blasting

Blasting would be required to create the building pads for the project and for the other uses in the planned ERTC business park. The EIR for the business park is expected to address the potential noise and vibration effects of the blasting required to create the building pads. The mitigation measures for blasting in the EIR are expected to ensure that blasting will not result in any significant noise or vibration impacts. As noted above, the Energy Commission will coordinate the review of the PEP with review of the DEIR, which is currently underway.

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 feed water and steam systems, the piping and tubing that comprises the steam path has accumulated dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. Traditionally, high pressure steam was then raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, was quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, was performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line was connected to the steam turbine, which was then ready for operation.

These high-pressure steam blows could produce noise as loud as 130 dBA at a distance of 100 feet. In order to reduce disturbance from steam blows, the steam blow piping could be equipped with a silencer that would reduce noise levels by 20 to 30 dBA, still an annoying noise level.

In recent years, a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™, has become popular. This method utilizes lower pressure steam over a continuous period of 36 hours or so. Resulting noise levels reach about 80 dBA at 100 feet. Noise levels at nearby receptors are typically similar to the ambient background noise level, and thus barely noticeable. Even more recently, compressed air has been substituted for steam in the continuous blow process, with resulting noise levels that are similar.

Based upon Energy Commission staff estimates, unsilenced steam blow noise levels could be as high as 105 dBA at the nearest receiver. With an appropriate silencer, such as a Fluid Kinetics Model TBS 16-AC, or similar, the noise levels could be reduced by 30 dBA, or to a level of 75 dBA at the nearest residence. Steam blow noise levels at the adjacent industrial land uses would be in the range of 80 dBA, as buildings could be as close as about 1,000 feet. The resulting noise levels could result in a significant impact at the adjacent land uses. The applicant has not addressed mitigation for the noise generated from construction steam blows.

In order to minimize annoyance due to steam or air blows, staff proposes Conditions of Certification to limit noise from steam blows by requiring the use of a temporary silencer to achieve the noise level cited above, and to implement a notification process to make neighboring land uses aware of impending steam blows (see proposed Conditions of Certification **NOISE-4** and **NOISE-5** below). This should ensure the process is tolerable to residents and adjacent land uses.

Linear Facilities

New off-site linear facilities will include reclaimed water and brine lines. Portions of these lines will be constructed within existing roadways in urban residential areas. Noise from these activities will be limited by adhering to the allowable hours of construction as cited in proposed Condition of Certification **NOISE-8**.

Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards, and has recognized those applicable LORS that would protect construction workers (Palomar 2001a, AFC § 5.9.2.1). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-3**.

PROJECT SPECIFIC IMPACTS — OPERATION

Community Effects

The applicant has incorporated some noise reduction measures into the design of the project. The applicant intends to achieve compliance with the noise performance standards of the City of Escondido Municipal Code. Compliance with LORS will not necessarily prevent a significant impact, since the allowable noise levels could be substantially higher than existing background noise levels.

Power Plant Operation

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

The primary noise sources anticipated from the facility include the combustion turbines, steam turbine, heat recovery steam generators, relief valves, main step-up

transformers, boiler feed pumps, cooling towers, and condensate pumps. The noise emitted by power plants during normal operations is generally broadband, steady state in nature. The resulting hourly average noise levels are typically dominated by the steady-state noise sources.

The applicant performed acoustical calculations to determine the facility noise emissions, and to develop noise mitigation measures. The calculations were based on typical manufacturer noise data for the major equipment planned for the facility (Palomar 2001a, AFC § 5.9.2). Specific noise mitigation measures evaluated in the AFC included:

- requiring combustion turbines to achieve 85 dBA at 3 feet;
- requiring the steam turbine generator to achieve 90 dBA at 3 feet;
- requiring exhaust stack silencers to achieve 56 dBA at 100 feet;
- providing a large berm to separate the west edge of the industrial park from the single-family residences to the west and southwest; and
- placement of the operations building to provide acoustical shielding for receptors east of the project site.

NOISE Table 5 lists the predicted project noise levels at the nearest receptors in terms of the ambient background noise level (L_{90}). The quietest four contiguous hours of the noise level measurement periods were used to represent ambient noise levels. The predicted noise levels include the applicant's proposed mitigation measures.

NOISE Table 5 – Summary of Predicted Operational Noise Levels

Receptor Sites	Nighttime L_{90}, dBA			
	Ambient	Project	Cumulative	Change
1 – Live Oak Area	34	30	36	+2
2 – Oak View Way	36	37	39	+3
3 – Mobile Homes	40	41	44	+4
4 – Industrial Area	44	64	64	+20

Based upon the predicted noise levels at the nearest receptors, Energy Commission staff believes that the operation of the PEP, as proposed, will not result in any substantial increases in background noise levels at the nearest sensitive receptors. The noise levels due to power plant operation would also comply with the standards of the City of Escondido Municipal Code for residential land uses.

Based upon the predicted noise levels, Energy Commission staff believes that the operation of the PEP, as proposed, will result in a substantial increase in background noise levels at the nearest industrial land uses. However, the noise levels produced by the project would comply with the provisions of the City of Escondido Municipal Code.

Although the increase in ambient noise levels will be substantial, the affected land uses are not considered to be noise sensitive, so no significant noise impact is expected.

The proposed Condition of Certification **NOISE-6** would require that the average noise level produced by the plant operation not exceed 37 dBA at any residence southwest of the project site, 41 dBA at any residence west of the project site, or 43 dBA at any sensitive receptor east of the project site. These standards would ensure that the nighttime background noise level (L_{90}) at the most-affected residential receptors would not increase by more than five dBA, and that noise due to the plant operations would not exceed the standards of the City of Escondido Municipal Code at those receptors.

The permitted changes in ambient noise levels of five dBA would be noticeable, but not necessarily annoying. The worst-case changes in ambient noise levels would affect only the homes closest to the project site. Power plant noise levels would be lower at all other receivers due to their greater distances from the project site, or to shielding provided by intervening topography or buildings.

Energy Commission staff believes that achieving the noise standards as required by **NOISE-6** will ensure that noise impacts will be less than significant.

Specifically, implementation of the proposed Condition of Certification **NOISE-6** would result in the noise levels shown in **NOISE Table 6**.

NOISE Table 6 - Conditioned Plant Operational Noise Levels and Resulting Ambient Noise Levels

Site	Noise Level, dBA			
	4-Hour Background Noise Level	Permitted Plant Noise Level	Cumulative	Resulting Increase in Ambient Noise Levels
1 – Live Oak Area	34	37	39	+5
2 – Oak View Way	36	41	41	+5
3 – Mobile Homes	40	43	45	+5

Tonal and Intermittent Noises

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. The applicant has stated that no strong tonal noises will be generated during the operation of the project.

The applicant has not addressed noise from steam relief vents, which may be silenced to mitigate the intermittent noise from pressure relief valves. Although these noise

sources, if mitigated, are expected to be in compliance with the LORS, their noise effects may be significant in the context of the quiet ambient noise environment.

To ensure that no strong tonal noises are present and that intermittent noises are mitigated, Energy Commission staff has included in proposed Condition of Certification **NOISE-6** a requirement that the applicant mitigate pure tones and the noise from steam relief valves.

Linear Facilities

The electrical output of the plant would be connected to the existing 230 kV transmission line adjacent to the project site (Palomar 2001a, AFC § 5.9.2.2). Noise from the transmission lines would include a corona discharge hum, which was found to be inaudible at the base of the power lines. The proposed 230 kV switchyard would be located on the project site, and would be at least 0.3 miles from the nearest residence. As a result of the large setbacks of the linear facilities from residences, no operational noise impacts would occur from linear facilities.

Worker Effects

The applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and has committed to comply with applicable LORS (Palomar 2001a, AFC § 5.9.2.2). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. The applicant would implement a comprehensive hearing conservation program. To ensure that workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-7**, below.

CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

The AFC evaluated the operational noise effects of other expected activities at the ERTC industrial park, and the applicant stated that noise impacts would be minimal (Palomar 2001a, AFC § 5.9.5). Energy Commission staff will independently evaluate the noise and vibration effects of the ERTC site development, and will report the relevant conclusions in the Final Staff Assessment.

Two energy-producing facilities (the RAMCO and CalPeak peaker plants) are in the immediate vicinity of the project, but the predicted noise levels from those facilities would not add to the noise levels produced by the project, as received at the nearest sensitive receptors. Traffic and industrial noise sources are present in the vicinity of the project site that could contribute to the cumulative noise levels at sensitive receptors. The effects of noise produced by those sources have been accounted for in part by the ambient noise level measurements, and the resulting noise levels are described in the noise level predictions listed above.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than fifty percent within a six-mile radius of the proposed PEP (please refer to **SOCIOECONOMICS Figure 1** in this Staff Analysis) . However, as indicated in **SOCIOECONOMICS Figure 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters. Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Based on the noise analysis, staff has identified a potentially significant direct impact resulting from the operation of the project, but with the mitigation proposed in the Conditions of Certification, this impact will be reduced to less than significant. Therefore, there is no potential disparate impact on the minority population, and there are no noise environmental justice issues related to this project.

FACILITY CLOSURE

In the future, upon closure of the PEP, all operational noise from the project would cease, and no further adverse noise impacts from operation of the PEP would be possible. The remaining potential temporary noise source is the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of the PEP, it can be treated similarly. That is, noisy work could be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that were in existence at that time would apply. Applicable Conditions of Certification included in the Energy Commission Decision would also apply unless modified.

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff concludes that the PEP, with the recommended mitigation, can be built and operated to comply with all applicable noise laws, ordinances, regulations, and standards. Energy Commission staff further concludes that if the PEP facility were designed as described above, and further mitigated as described below in the proposed Conditions of Certification, it is not expected to produce significant adverse noise impacts. To ensure compliance with all applicable noise LORS and mitigation of noise impacts to less than significant levels, Energy Commission staff recommends adoption of the following Conditions of Certification.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE- At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the CPM in the first Monthly Compliance Report following the start of ground disturbance, a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

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

- Use the Noise Complaint Resolution Form (below), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- If the noise is project related, take all feasible measures to reduce the noise at its source; and
- Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within 5 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, with the local jurisdiction and the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE-3 Prior to the start of ground disturbance, the project owner shall submit to the CPM for review a construction noise control program. The noise control

program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to Cal-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 75 dBA measured at the nearest sensitive receptor. The project owner shall conduct steam blows only during the hours of 7 a.m. to 6 p.m., Monday through Friday, unless the CPM agrees to longer hours based on a demonstration by the project owner that offsite noise impacts will not cause annoyance.

If a low-pressure continuous steam blow or air 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, who shall review the proposal with the objective of ensuring that the resulting noise levels will not exceed 45 dBA at any sensitive receptor. If the low-pressure process is approved by the CPM, the project owner shall implement it in accordance with the requirements of the CPM.

Verification: At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer and the noise levels expected, and a description of the steam blow schedule.

At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 Prior to the first steam or air blow(s), the project owner shall notify all residents and business owners within one mile of the site of the planned activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam or air blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: The project owner shall notify residents and business owners at least 15 days prior to the first high pressure steam blow(s). 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 or air blow activities, including a description of the method(s) of that notification.

NOISE-6 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the noise level produced by operation of the project will not exceed an hourly average noise level of:

- 37 dBA at any residence in the vicinity of Site 1 (Live Oak Road Neighborhood)
- 41 dBA at any residence in the vicinity of Site 2 (Oak View Way)
- 43 dBA at any residence east of the project site.

No new pure tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints, as determined by the CPM. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints, as determined by the CPM.

A. Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at Sites 1, 2, and 3. The noise surveys shall also include short-term measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced.

B. If the results from the operational noise survey indicate that the noise level due to the plant operations exceeds the noise standards cited above, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

C. If the results from the operational noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: Within 15 days after completing the post-construction survey, the project owner shall submit a summary report of the survey to the City of Escondido Planning Department, and to the CPM. Included in the survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 15 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

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

NOISE-8 Heavy equipment operation and noisy construction or demolition work shall be restricted to the times of day delineated below:

Weekdays	7 a.m. to 6 p.m.
Saturdays	10 a.m. to 5 p.m.

Noise produced by heavy equipment shall not exceed an hourly L_{eq} of 75 dBA measured at or within any residential property. Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

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

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Palomar Energy Project
(01-AFC-24)

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

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NOISE APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **Noise Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (Leq), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (Ldn). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical Ldn values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (Effects of Noise on People, U.S. Environmental Protection Agency, December 31,1971).

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

Noise Table A1 Definition of Some Technical Terms Related to Noise	
Terms	**Definitions**
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level, L_{eq}	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L_{dn} or DNL	The Average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.

Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Control Ordinance, California Department of Health Services 1976, 1977.

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

Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980

SUBJECTIVE RESPONSE TO NOISE

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

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

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

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

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

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a three dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. A ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response. (Kryter, Karl D., The Effects of Noise on Man, 1970)

COMBINATION OF SOUND LEVELS

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

Noise Table A3
Addition of Decibel Values

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

Source: Architectural Acoustics, M. David Egan, 1988

SOUND AND DISTANCE

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source 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: 29 C.F.R. § 1910.95

PUBLIC HEALTH

Alvin J. Greenberg, Ph.D.

INTRODUCTION

The purpose of the public health analysis is to determine if toxic emissions from the proposed Palomar Energy Project will have the potential to cause significant adverse public health impacts or to violate standards for public health protection. If potentially significant health impacts are identified, staff will evaluate mitigation measures to reduce such impacts to insignificant levels.

Staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section of this Preliminary Staff Assessment (PSA). Impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** section. Health effects from electromagnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams to the public sewer system are discussed in the **Soils and Water Resources** section. Plant releases in the form of hazardous and nonhazardous wastes are described in the **Waste Management** section.

The following sections describe staff's method of analyzing potential health impacts and the criteria used to determine their significance.

METHOD OF ANALYSIS

Staff is concerned about toxic emissions to which the public could be exposed during project construction and routine operation. Following the release of toxic contaminants into the air or water, people may come into contact with them through inhalation, dermal (skin) contact, or ingestion via contaminated food or water.

Toxic pollutants which are emitted to the atmosphere and for which no ambient (outdoor) air quality standards have been established are called noncriteria pollutants. Such noncriteria pollutants, such as benzene, formaldehyde, and ammonia are included in this **Public Health** analysis. Noncriteria pollutants differ from criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide, for which federal and state ambient air quality standards have been established that specify levels considered safe for everyone. Criteria pollutants are considered in staff's **Air Quality** analysis.

Since noncriteria pollutants do not have such standards, a process known as health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment procedure consists of the following steps:

1. Identify the types and amounts of hazardous substances that the Palomar Energy Project could emit to the environment;
2. Estimate worst-case concentrations of project emissions in the environment using dispersion modeling;

3. Estimate amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact; and
4. Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Initially, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to project emissions. In reality, it is likely that the actual risks from the power plant will be much lower than the risks which are estimated by the screening level assessment. If the screening analysis predicts no significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic site-specific assumptions would be performed to obtain a more accurate assessment of potential public health risks.

This is accomplished by examining conditions that would lead to the highest, or worst-case risks, and then using those in the study. Such conditions include:

- using the highest levels of pollutants that could be emitted from the plant;
- assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- using the type of air quality computer model which predicts the greatest plausible impacts;
- calculating health risks at the location where the pollutant concentrations are calculated to be the highest;
- using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
- assuming that an individual's exposure to cancer-causing agents occurs for 70 years.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances which could present a health hazard from noninhalation pathways of exposure (see CAPCOA 1993, Table III-5). When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA 1993, p. III-19).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) noncancer effects, and cancer risk (also long-term). Acute health effects result from short-term (one-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those which arise from long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from ten to one hundred percent of a lifetime (from seven to seventy years). Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called “reference exposure levels” or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects (CAPCOA 1993, p. III-36). These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease that makes them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature, and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available when the standard was developed and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformance with California Air Pollution Control Officers Association (CAPCOA) guidelines, the health risk assessment assumes that the effects of each substance are additive for a given organ system (CAPCOA 1993, p. III-37). In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact.

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions. In reality, the risk is generally too small to actually be measured. For example, the one-in one-million risk level represents a one-in-one million increase in the normal risk of developing cancer over a lifetime, at whatever location is estimated to have the worst-case risk.

Cancer risk is expressed in chances per million, and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called “potency factors,” and established by the California Office of Environmental Health Hazard Assessment), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be lower, or even considerably lower, than those estimated.

SIGNIFICANCE CRITERIA

Energy Commission staff determines the health effects of exposure to toxic emissions based on impacts to the maximum exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions, as described above.

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. Significance of project health impacts is determined separately for each of the three categories.

Acute and Chronic Noncancer Health Effects

Staff assesses the significance of non-cancer health effects by calculating a "hazard index." A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance which has the same type of health effect is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels (safe levels). Under these conditions, health protection is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant non-cancer project-related public health impacts.

Cancer Risk

Staff relies upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance to determine a cancer risk significance level. Title 22, California Code of Regulations, § 12703(b) states that "the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure." This level of risk is equivalent to a cancer risk of ten in one million, or 10×10^{-6}. An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than that which applies to Proposition 65.

The significant risk level of ten-in-one million is consistent with the level of significance adopted by the various air districts in California pursuant to Health and Safety Code § 44362(b), which requires notification of nearby residents when an air district determines that there is a significant health risk from a facility. In addition, the San Diego Air Pollution Control District's Risk Management Policy states that a project with an incremental cancer risk of between one and ten in a million is acceptable if best available control technology has been applied to reduce risk. In general, the San Diego Air Pollution Control District would not approve a project with a cancer risk exceeding ten in one million.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows cancer risks above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. If facility risk, based on refined assumptions, exceeds the significance level of ten in one million, staff would require appropriate measures to reduce risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than ten in one million, staff would deem such risk to be significant, and would not recommend project approval.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Clean Air Act section 112 (42 U.S. Code section 7412)

Section 112 requires new sources which emit more than ten tons per year of any specified hazardous air pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology (MACT).

STATE

California Health and Safety Code sections 39650 et seq.

These sections mandate the California Air Resources Board (CARB) and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.

California Health and Safety Code section 41700

This section states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

LOCAL

San Diego Air Pollution Control District (SDAPCD) rule 1200(d)(i) requires safe exposure limits for Toxic Air Contaminants (TACs), use of Best Available Control Technology (BACT), and New Source Review (NSR).

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as

meteorology and terrain, affect the project's potential for causing impacts on public health. For example, an emissions plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influence the surrounding population distribution and density, which, in turn, affects public exposure to project emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The proposed site is located on approximately 20 acres of a planned 186-acre industrial park in the City of Escondido, San Diego County. The site lies west of Interstate 15 and south of State Highway 78, about 600 feet southwest of the intersection of Vineyard Avenue and Enterprise Street. The site is currently vacant and part of it was formerly an avocado and citrus grove. The site topography is sloped, with an elevation from 740 to 826 feet above sea level.

The project area is zoned Specific Plan and the existing and planned land uses in the project area are primarily industrial. No prime agricultural lands are present within the study area. Adjacent to the property to the north exists a new 49 MW gas-fired combustion turbine plant that is now operating. Adjacent to the property to the west are San Diego Gas and Electric Company's transmission corridor and areas planned for future industrial development.

The nearest residence is about 1800 feet to the west of the project site. A residential area is located about 2800 feet southeast of the project site. The nearest local community is the City of Escondido. As mentioned above, the location of sensitive receptors near the proposed site is an important factor in considering potential public health impacts. The nearest schools are Del Dios Middle School, located about 1 mile southeast of the project site, and Little Country Preschool, located about 1 mile south of the site.

METEOROLOGY

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. Pollutant dispersion and transport, in turn, affect the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposure may be increased.

San Diego County has five distinct climate zones that run nearly parallel to the coast, just as the mountains of California do. Each climatic zone has its own characteristic climatology. The City of Escondido lies in the transitional climate zone of San Diego County. The transitional zone includes communities about 20 to 25 miles inland from the Pacific Ocean. Normally these areas have warm, dry climate but may also experience brief periods of coastal climate conditions with morning fog, clouds and moderate humidity. In the summertime, temperatures may reach 100 degrees F. Daytime winter temperatures are milder, around 70 degrees F, with cooler temperatures

in the mornings (SDAPCD 2002). Wind direction is predominately from the west-northwest during the months of February through October and from the northeast during November through January.

Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. Mixing heights (the height above ground level through which the air is well mixed and in which pollutants can be dispersed) are lower during mornings due to temperature inversions and increase during the warmer afternoons. Staff's **Air Quality** section presents more detailed meteorological data.

EXISTING AIR QUALITY

The proposed site is within the jurisdiction of San Diego Air Pollution Control District. By examining average toxic concentration levels from representative air monitoring sites in California with cancer risk factors specific to each contaminant, lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air. For comparison purposes, it should be noted that the overall lifetime cancer risk for the average individual is about one-in-four, or 250,000 in one million.

The toxic air monitoring stations closest to the Palomar Energy Project are in Chula Vista and El Cajon, approximately 40 and 30 miles south of the Palomar Energy Project site, respectively. Based on levels of toxic air contaminants measured at these monitoring stations in 2000, the background cancer risk calculated is 170-in-one million at Chula Vista and 208-in-one million at El Cajon (CARB 2002). The pollutants 1,3-butadiene and benzene, emitted primarily from mobile sources, were the two highest contributors to risk and together accounted for over half of the total. At El Cajon the risk from 1,3-butadiene was about 68 in one million, while the risk from benzene was about 69 in one million. Risk from benzene and 1,3-butadiene at Chula Vista was 51 in one million for each substance. Formaldehyde accounts for about nine percent of the ambient cancer risk determined for Chula Vista, with a risk of about 16 in one million and about eight percent of ambient risk at El Cajon, with a risk of about 17 in one million. Formaldehyde is emitted directly from vehicles and other combustion sources, such as the proposed Palomar project.

The use of reformulated gasoline, beginning in the second quarter of 1996, as well as other toxics reduction measures, have led to a decrease of ambient levels of toxics and associated cancer risk during the past few years. For example, at the El Cajon monitoring station, cancer risk was 366 in one million based on 1993 data and 257 in one million based on 1996 data. At the Chula Vista monitoring station, cancer risk was 251 in one million based on 1993 data and 240-in-one million based on 1995 data.

SITE CONTAMINATION

Site disturbances will occur during facility construction from excavation, grading, and earth moving. Such activities have the potential to adversely affect public health through various mechanisms, such as the creation of airborne dust, material being carried off-site through soil erosion, and uncovering buried hazardous substances.

On behalf of Sempra, a Phase I Environmental Site Assessment (ESA) was conducted by ENSR in accordance with American Society for Testing and Materials Standard E 1527-00, Standard Practice for Environmental Site Assessments (Palomar 2001a, Appendix H). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities. The results of the ESA, the database search for potentially contaminated sites which may be encountered during construction of the linear facilities, and other waste management issues are summarized in staff's **Waste Management** section.

IMPACTS

CONSTRUCTION

Potential risks to public health during construction may be associated with exposure to toxic substances in contaminated soil disturbed during site preparation, as well as from heavy equipment operation. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are examined in staff's **Air Quality** analysis.

As described in the **Waste Management** section, a Phase I Environmental Site Assessment (ESA) has been performed. The ESA shows no evidence of significant site contamination. However, to ensure that pesticides are not present, staff requested that limited sampling and analysis (conducted pursuant to DTSC guidelines) be conducted on the northern end of the site. The result will be described in the **Waste Management** section of the Final Staff Assessment.

The **Waste Management** section also discusses potentially contaminated sites which may be encountered during construction of the linear facilities. As noted in the **Waste Management** section, Palomar Energy Project has proposed procedures to ensure proper management of soil that might be contaminated when construction occurs in areas near suspected contamination.

The operation of construction equipment will result in air emissions from diesel-fueled engines. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust contains over 40 substances that are listed by the U.S. EPA as hazardous air pollutants and by the Air Resources Board (ARB) as toxic air contaminants. Because of the many constituents in diesel exhaust as well as evidence that the particles themselves may have intrinsic toxic and carcinogenic properties, many researchers have used the particles to quantify exposure to whole diesel exhaust, including the Scientific Review Panel on Toxic Air Contaminants (SRP) as noted below.

Exposure to diesel exhaust causes both short- and long-term adverse health effects. Short-term effects can include increased cough, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased

coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Based on a number of health effects studies, the SRP recommended a chronic REL (see REL discussion in Method of Analysis section above) for diesel exhaust particulate matter of 5 $\mu g/m^3$ and a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$ (SRP 1998, p. 6). The SRP did not recommend a value for an acute REL, since available data in support of a value was deemed insufficient. On August 27, 1998, the ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved SRP's recommendations regarding health effect levels.

Construction of Palomar Energy Project is anticipated to take place over a period of twenty-one months. As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from seven to seventy years.

AFC Section 5.2 and Appendix E.2 present diesel exhaust emissions from engines and fugitive dust from construction activities (Palomar 2001a). Worst-case daily emissions of 56.6 and 53.3 lb/day PM10 are expected to occur in months eleven and twelve, respectively (Table E.2-5) from on-site construction equipment, motor vehicles and fugitive dust emissions. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Worst-case exhaust emissions of 0.31 lb/hr PM10 were modeled based on diesel emissions from on-site construction vehicles (Table E.2-30). Modeling construction activities, which are assumed to occur for eight hours per day, gives a 24-hour maximum total predicted concentration of 86 $\mu g/m^3$ (20.7 $\mu g/m^3$ calculated project impact added to a background of 65 $\mu g/m^3$). Worst-case individual cancer risk due to diesel exhaust emissions during project construction is estimated to be 0.33 per million at the site of the maximum exposed individual resident (MEIR). Risk to the maximum exposed individual worker (MEIW) at the commercial building nearest to the project site is 3.9 per million, while risk at the point of maximum impact, located at the project property line, is 8.6 per million. Mitigation measures are proposed to reduce the maximum calculated PM10 concentrations. These include the use of extensive fugitive dust control measures. The fugitive dust control measures are assumed to result in 90 percent reductions of emissions.

In order to mitigate potential impacts from particulate emissions during the operation of diesel-powered construction equipment, staff recommends the use of ultra low sulfur diesel fuel and the installation of soot filters on stationary diesel equipment (see proposed **Air Quality** Conditions of Certification). The catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is comparable for both mitigation measures in the range of approximately 85-92 percent. Such filters will reduce diesel emissions during construction and reduce any potential for significant health impacts.

OPERATION

Emissions Sources

The emissions sources at the proposed Palomar Energy Project include two combustion turbine generators and one steam turbine-generator, two heat recovery steam generators, a diesel engine-driven fire pump engine, and a wet cooling tower. During operation, potential public health risks are related to diesel exhaust emissions from testing the diesel engine-driven fire pump engine, natural gas combustion emissions from the gas turbines and duct burners, and combustion emissions from the auxiliary boiler.

As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted from the facility.

Tables 5.15-3 and 5.15-4 of the AFC lists non-criteria pollutants that may be emitted from the project turbines as combustion byproducts, along with their anticipated amounts (emission factors). Emission factors are from the California Air Toxics Emission Factors (CATEF II) database (CARB 2002). Table 5.15-5 lists the emission rates from operation of the cooling tower. Table 5.15-7 of the AFC lists toxicity values used to characterize cancer and noncancer health impacts from project pollutants. The toxicity values include reference exposure levels, which are used to calculate short-term and long-term noncancer health effects, and cancer unit risks, which are used to calculate the lifetime risk of developing cancer, as published in the CAPCOA Guidelines (CAPCOA 1993). **Public Health** Table 1 lists toxic emissions and shows how each contributes to the health risk analysis. For example, the first row shows that oral exposure to acetaldehyde is not of concern, but if inhaled, may have cancer and chronic (long-term) noncancer health effects, but not acute (short-term) effects.

Emissions Levels

Once potential emissions are identified, the next step is to quantify them by conducting a “worst case” analysis. Maximum hourly emissions are required to calculate acute (one hour) noncancer health effects, while estimates of maximum emissions on an annual basis are required to calculate cancer and chronic (long-term) noncancer health effects.

AFC Tables 5.15-3 and 5.15-4 show maximum hourly and annual emissions for the gas turbines and Table 5.15-5 shows maximum hourly and annual emissions for the cooling tower. The maximum fuel use is combined with the emission factor for each toxic air contaminant to estimate hourly and maximum annual emissions for the operational conditions described in Section 5.2. Emission factors are estimates of the amounts of toxic substances released per unit of fuel burned and are from the California Air Toxic Emission Factors (CATEF II) database maintained by the California Air Resources Board.

The next step in the health risk assessment process is to estimate the ambient concentrations of toxic substances. This is accomplished by using a screening air dispersion model and assuming conditions that result in maximum impacts. The

screening analysis was performed using the U.S. EPA approved ISCST3 dispersion modeling program and the AERMOD dispersion modeling program (please see staff's

Public Health Table 1
Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Noncancer (Chronic)	Noncancer (Acute)
Acetaldehyde			✔	✔	
Acrolein				✔	✔
Ammonia				✔	✔
Arsenic	✔	✔	✔	✔	✔
Benzene			✔	✔	✔
1,3-Butadiene			✔	✔	
Cadmium			✔	✔	
Chromium			✔	✔	
Copper				✔	✔
Ethylbenzene				✔	
Formaldehyde			✔	✔	✔
Hexane				✔	
Lead			✔	✔	
Mercury				✔	✔
Napthalene		✔		✔	
Nickel			✔	✔	✔
Polynuclear Aromatic Hydrocarbons (PAHs)	✔		✔		
Propylene				✔	
Propylene oxide			✔	✔	✔
Toluene				✔	✔
Xylene				✔	✔
Zinc				✔	

Source: AFC Table 5.15-7 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993 and SRP 1998.

Air Quality section for a detailed discussion of the modeling methodology). In order to identify sites of maximum impact, two receptor domains were identified and evaluated. For nearfield impacts at or below stack height, the simple terrain (MainISC) receptor domain was evaluated using the ISCST3 model. For elevated terrain impacts above stack height, the West Hills receptor domain, located west-southwest of the project site, was evaluated using the AERMOD model. Finally, ambient concentrations were used in conjunction with RELs and cancer unit risk factors to estimate health effects that might

occur from exposure to facility emissions. Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

The above method of assessing health effects is consistent with the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spot" Program Revised 1992 Risk Assessment Guidelines (October 1993) referred to earlier, and results in the following health risk estimates.

Impacts

The screening health risk assessment for the project, including combustion and non-combustion emissions, resulted in a maximum acute hazard index of 0.30 at the western fenceline of the Palomar facility based on simple terrain modeling (MainISC receptor domain). The chronic hazard index at the point of maximum impact is 0.05. The location of the maximum chronic hazard is about two miles west-southwest of the Palomar project site, predicted using the West Hills domain (elevated) (Palomar 2001a, Table 5.15-8). As **Public Health Table 2** shows, both acute and chronic hazard indices are under the REL of 1.0, indicating that no short- or long-term adverse health effects are expected.

Public Health Table 2
Operation Hazard/Risk

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
ACUTE NONCANCER	0.30	1.0	No
CHRONIC NONCANCER	0.05	1.0	No
INDIVIDUAL CANCER	0.92×10^{-6}	10.0×10^{-6}	No

Source: Palomar 2001a, Section 5.15.2.3 and Table 5.15-8.

Cancer Risk

As shown in **Public Health Table 2**, total worst-case individual cancer risk is calculated to be 0.92 in one million at a location approximately two miles west-southwest of the Palomar project site, predicted using the West Hills domain (elevated). The peak sensitive receptor cancer risk is 0.1 in one million.

CUMULATIVE IMPACTS

The maximum impact location occurs where pollutant concentrations from the Palomar Energy Project would theoretically be the highest. Even at this location, staff does not expect any significant change in lifetime risk to any person, and the increase of 0.92 in one million does not represent any real contribution to the average lifetime cancer risk of 250,000 in one million. Modeled facility-related residential risks are lower at more distant locations, and actual risks are expected to be much lower, since worst-case estimates are based on conservative assumptions, and overstate the true magnitude of the risk expected. Therefore, staff does not consider the incremental impact of the

additional risk posed by the Palomar Energy Project to be either significant or cumulatively considerable.

The worst-case long-term noncancer health impact from the project (0.05 hazard index) is well below the significance level of 1.0 at the location of maximum impact. At this level, staff does not expect any cumulative health impacts to be significant. As with cancer risk, long-term hazard would be lower at all other locations, and cumulative impacts at other locations would also be less than significant.

Even in the unlikely event that worst-case emissions from an existing facility were to coincide both geographically and temporally with Palomar Energy emissions at the location of maximum impact, the overall long-term health outlook would not change for anyone. Thus, the Palomar Energy Project will not result in any significant cumulative cancer or chronic noncancer health impacts.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed Palomar Energy project (please refer to **Socioeconomics Figure 1** in this Staff Assessment). However, as indicated in **Socioeconomics Figure 1**, there are five census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters. The nearest minority pocket is approximately two miles east of the project site (Palomar 2001a Figure 5.8-2). Staff also reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because staff have determined there to be pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for **Public Health**.

Based on the **Public Health** analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project and, therefore, there are no public health environmental justice issues related to this project.

COMPLIANCE WITH LORS

Staff concludes that construction and operation of the Palomar Energy Project will be in compliance with all applicable LORS regarding long-term and short-term project impacts.

FACILITY CLOSURE

The scope of staff's public health analysis is limited to routine releases of harmful substances to the environment. During either temporary or permanent facility closure, the major concern would be from accidental or non-routine releases from either hazardous materials or wastes which may be onsite. These are discussed in the sections **Hazardous Materials** and **Waste Management**, respectively. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the environment, since the facility would not be operating. For permanent closure, the only

routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

CONCLUSIONS

Staff has analyzed potential public health risks associated with construction and operation of the Palomar Energy project, and does not expect there to be any significant adverse cancer, or short- or long-term noncancer health effects from project emissions if the mitigation proposed by the applicant and recommended by staff in the Air Quality section of this assessment is implemented.

The health risk assessment performed by the applicant has been reviewed by staff and was found to be in accordance with guidelines adopted by OEHHA (Office of Environmental Health Hazard Assessment), CARB and CAPCOA. Pursuant to the SDAPCD Risk Management Policy, the increased carcinogenic risk attributed to this project is considered to be not significant since it is less than 1.0 in one million. The chronic hazard index attributed to the emission of non-carcinogenic air contaminants is considered to be not significant since it is less than 1.0. Therefore, the Palomar Energy Project complies with the SDAPCD Toxic Risk Management Policy.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions are proposed.

REFERENCES

BAAQMD. 1993. Bay Area Air Quality Management District. Cumulative Air Toxics Modeling Study. Staff Report. July.

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San Diego Air Pollution Control District (SDAPCD). 2002. Climate & Smog Fact Sheet, http://www.sdapcd.co.san-diego.ca.us.

SRP. 1998. Scientific Review Panel on Toxic Air Contaminants. Findings of the Scientific Review Panel on The Report On Diesel Exhaust as adopted at the Panel’s April 22, 1998 Meeting.

SOCIOECONOMICS

James Adams

INTRODUCTION

This staff socioeconomic impact analysis evaluates the potential project-induced changes on community services and/or infrastructure including schools, medical and protective services and related community issues such as environmental justice. The analysis discusses the potential direct, secondary (indirect and induced) and cumulative impacts of the proposed Palomar Energy Project (PEP) on local communities, community resources, and public services.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

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

Civil Rights Act of 1964, Public Law 88-352, 78 Stat. Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national origin in all programs or activities receiving federal financial assistance.

STATE

California Government Code, Sections 65996 and 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 Government Code Section 65996(a). The relevant provisions restrict fees for the development of commercial and industrial space to approximately $0.31 per square foot of "chargeable covered and enclosed space." (Govt. Code 65995 (b)(2))

14 California Code of Regulations, Section 15131

In accordance with the California Environmental Quality Act Guidelines (Section 15131):

(a) Economic or social effects of a project shall not be treated as significant effects on the environment.

(b) Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.

(c) Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

LOCAL

City of Escondido

City of Escondido General Plan

Goal 5: Encourage more high quality industrial, retail, manufacturing and service oriented business that create and maintain a strong economic base and provide an environment for the full employment of a diverse set of skills (City of Escondido 1990).

Economic Policy B3.2: The City will encourage a variety of economic activities in Escondido that:

(a) diversify and balance the economic base and cushion the City's economy against a downturn in any one sector and against cyclical fluctuations,

(b) provide a broad spectrum of employment opportunities ranging from semi-skilled to high-technology positions,

(c) reduce the need for Escondido residents to commute out of the area,

(d) improve the City's fiscal stability,

(e) encourage all property development in office, commercial and industrial sectors to enhance property values,

(f) maintain workable and effective environmental regulations and standards,

(g) provide support products and services for local businesses.

Escondido Research and Technology Center Specific Plan

This Specific Plan replaces the Quail Hills Specific Plan that was adopted by the City of Escondido in 1988 (Palomar 2001a, page 5.7-2). It encompasses an area of approximately 208 acres of essentially vacant land located in western Escondido. The area is divided into ten planning areas, with planning area 1 allowing for developing either a light industrial park (Alternative A), or a power generating facility (Alternative B). The plan is currently being reviewed by the City of Escondido. A Final Environmental Impact Report is expected in November 2002.

SETTING

POPULATION

The Cities of Escondido, San Marcos, and the County of San Diego are considered areas that may be affected by potential population inmigration resulting from the proposed project. Historic, recent, and projected population figures for San Diego County, the City of Escondido, and the City of San Marcos are summarized in **SOCIOECONOMICS TABLE 1**.

SOCIOECONOMICS TABLE 1
Recent and Projected Population Figures for the Study Area

Area	Year				
	1980	1990	2000	2010	2020
San Diego County	1,873,300[1]	2,511,400[1]	2,813,833[2]	3,437,700[1]	N/A
City of Escondido	64,355[3]	108,635[3]	133,559[1]	N/A	N/A
City of San Marcos	17,250[4]	37,900[4]	54,977[2]	N/A	N/A

Sources:
1 SANDAG, 2020 Regionwide Forecast, 1998
2 U.S. Census Bureau, Census 2000
3..SANDAG, Fast Facts-City of Escondido, 2002
4..San Marcos Chamber of Commerce, 2002
N/A Not Available

Demographic Characteristics

SOCIOECONOMICS TABLE 2 provides minority population percentages for the State of California, County of San Diego, City of Escondido, and a six-mile radius of the proposed project. The six-mile radius is used in staff's Environmental Justice screening analysis, described in the Impacts section of this analysis. The six-mile radius includes an area larger than the City of Escondido, and encompasses part of the jurisdictions of San Diego County and the City of San Marcos. The ethnic/racial profile is based on 2000 Census data. **SOCIOECONOMICS FIGURE 1** presents the percent of people of color by census blocks within a six-mile radius of the proposed project. Within the six-mile radius, 44.4 percent of the population are people of color. There are several census blocks within the Cities of San Marcos and Escondido that have a people of color population greater than 75 percent. These occur in two pockets or clusters. One is located in Escondido within three miles (east) of the proposed PEP; the other is located in San Marcos approximately four miles west of the PEP.

INSERT SOCIOECONOMICS – FIGURE 1

SOCIOECONOMICS TABLE 2

Demographic Profile of Proposed Project Area, 2000

Race/Ethnicity	Population
State of California	
Total Population	**33,871,648**
White Population	**20,170,059 (59.5%)**
People of Color* (Minority Population)	**13,701,589 (40.5%)**
San Diego County	
Total Population	**2,813,833**
White Population	**1,871,839 (66.5%)**
People of Color* (Minority Population)	**941,994 (33.5%)**
City of Escondido	
Total Population	**133,559**
White Population	**90,578 (68%)**
People of Color* (Minority Population)	**42,981 (32%)**
Six-Mile Radius of PEP Site	
Total Population	**212,643**
White Population	**118,166 (55.6%)**
People of Color* (Minority Population)	**94,477 (44.4%)**
***People of Color includes Black, Asian, Hispanic, and American Indian Source: 2000 US Census Data, SANDAG 2001, Based on census blocks**	

Low-Income Population

Within the local project area, a household is considered low-income if its income is less than 80 percent of the median for that area (California Department of Finance, 2000). **SOCIOECONOMICS TABLE 3** summarizes the low-income population for 1990 Census block groups within a six-mile radius of the proposed project.

SOCIOECONOMICS TABLE 3

Low-Income Population Within Six-Mile Radius of Proposed Project, 1990

	Six-Mile Radius
Total Population	**167,941**
Low-Income Population*	**17,268 (10.3%)**
***Low-Income defined as a household of four with annual income less than $17,030 (US Census, 2000), based on census block groups**	

Based on the 2000 Census, the median household income for the City of Escondido in 2000 was $42,567, $45,908 for the City of San Marcos, and $47,067 for San Diego County (U.S. Census Bureau, 2000).

In 1990, approximately 10.3 percent of the population within a six-mile radius of the proposed power plant site were living in poverty. Applicable data from the 2000 census is not yet available; however, data is available for cities and counties. In December of 1999, approximately 12.5 percent of the individuals living in San Diego County were living in poverty. The corresponding numbers for the City of Escondido and San Marcos are 13.4 and 12.0 percent respectively (U.S. Census Bureau, Census 2000).

EMPLOYMENT

As noted above, staff has determined that the potentially affected area includes the Cities of Escondido, San Marcos and the County of San Diego. The area was identified per the Electric Power Research Institute's report titled "Socioeconomic Impacts of Power Plants," which states that construction workers will commute as much as two hours to construction sites from their homes rather than relocate. Additionally, the

report states operational workers will commute as much as one hour to a power plant site from their homes rather than relocate. Although portions of Orange, San Bernadino, and Riverside Counties are within a one- to two-hour commute of the project site, and can provide a potential source of labor, they have been excluded from this analysis because San Diego County has a sufficient labor pool for construction and operation of the project.

SOCIOECONOMICS TABLE 4 identifies labor force characteristics for the Cities of Escondido and San Marcos and for San Diego County in the year 2000. The civilian labor force represents all residents between 18-55 years of age and currently employed. **TABLE 4** also indicates that services, manufacturing, retail trade, education, health and social services are the major sources of employment. The construction sector employs approximately 82,281 workers in San Diego County, 5,374 workers within the City of Escondido, and 2,039 within the City of San Marcos (U.S. Census Bureau, Census 2000).

The February 2001 unemployment rate for the City of Escondido was 3.3 percent (California Employment Development Department, 2001), slightly higher than the San Diego County-Wide average rate of 3.2 percent during the same time period. Since 1990, the unemployment rate for the City of Escondido has decreased overall. Historically, the unemployment rate for the City of Escondido has ranged between 4.8 (1990) and 6.6 percent (1995), with a steady decrease in the unemployment rate since 1995 (California Employment Development Department, 2001).

SOCIOECONOMICS TABLE 4
Labor Force Characteristics of San Diego County and the Cities of San Marcos and Escondido, 2000

	San Diego County	City of San Marcos	City of Escondido
Civilian labor force	1,319,517	25,956	61,197
Unemployment	78,259 5.9%	1,453 5.6%	3,371 3.9%
Agriculture, forestry, fishing, hunting, mining	8,604 0.7%	345 1.4%	1,069 1.9%
Construction	82,281 6.6%	2,039 8.3%	5,374 9.4%
Manufacturing	136,486 11.0%	4,551 18.6%	8,366 14.6%
Wholesale trade	40,357 3.3%	1,275 5.2%	2,086 3.6%
Retail trade	139,743 11.3%	3,025 12.3%	7,362 12.8%
Professional, scientific, management, etc.	164,882 13.3	2,945 12.0%	7,466 13.0%
Transportation/ utilities, warehousing	47,610 3.8%	843 3.4%	1,954 3.4%
Education, health & social services	239,756 19.3%	3,449 14.1%	8,737 15.2%
Finance/insurance	88,285 7.1%	1,403 5.7%	3,216 5.6%
Services	183,020 14.8%	3,324 13.6%	8,416 14.6%
Public Administration	67,054 5.4%	643 2.6%	1,866 3.2%

Source: U.S. Bureau of the Census, Census 2000

HOUSING

As of January 2000, there were approximately 1.04 million total housing units in San Diego County, with about 45,500 houses vacant, or 4.4 percent of the total housing units. These totals include single-family, multi-family, and mobile home residences. The City of Escondido had about 45,000 total housing units with a vacancy rate of 2.7 percent, while the City of San Marcos had almost 19,000 total housing units with a 4.0 percent vacancy rate. The vacancy rate for both cities and San Diego County is below the federal housing standard of 5 percent. Vacancy rates below 5 percent indicate a shortage in available housing. In addition, there are approximately 14,400 housing units (motels, hotels, rentals, trailer parks, etc.) available for seasonal, recreational, or occasional use in San Diego County. The corresponding figures for the Cities of Escondido and San Marcos are 110 and 62 respectively (U.S. Census Bureau, Census 2000).

UTILITIES, EMERGENCY, AND OTHER PUBLIC SERVICES

Natural Gas

The project will be fueled by natural gas delivered at the site by the San Diego Gas and Electric Company (SDG&E), a California Public Utility. Once system upgrades in process are completed, there will be sufficient in-line capacity to serve the projects needs (see **Power Plant Reliability** section of this PSA for further information).

Electricity

Electricity is delivered to the project site and the City of Escondido via the existing electricity grid. The project will connect to an existing 230 kV transmission line which runs along the western boundary of the proposed site. No major upgrades or new transmission lines will be needed.

Sewer & Water

Reclaimed water will be supplied by the City of Escondido's Hale Avenue Resource Recovery Facility. Potable water will be provided by the Rincon del Diablo Municipal Water District. Wastewater from the PEP will be returned to the Hale Avenue Resource Recovery Facility (see the **Project Description** and **Water Resources** section of the PSA for further details).

Police Protection

The Escondido Police Department (EPD) has primary responsibility for policing a fifty-square mile area, which includes the proposed project site. The EPD (located on Grand Avenue) is approximately three miles from the PEP site, and has 255 sworn, non-sworn, and civilian employees. In addition, the California Highway Patrol (CHP) can assist in an emergency situation. The nearest CHP station is in Oceanside, approximately 20 miles west of Escondido. According to the Police Services division, the EPD projects a two to three minute response time to the proposed PEP site (City of Escondido, 2002a).

Schools

Within the City of Escondido, there are 14 elementary schools, five middle schools, three high schools, one continuation school and one adult education school (Palomar 2001a, pg. 5.8-4, City of Escondido 2002b). Total enrollment in the fall of 1999 was approximately 27,000. Enrollment is expected to increase 1-2 percent annually, although some schools within the Escondido High School District have increased by eight percent since 1998 (Palomar 2001a, page 5.8-5).

Other Public Services

Other public services in a community include hospitals, and emergency medical care. The primary hospital serving the project site within the City of Escondido is Palomor Hospital, which has 323 beds and a 24-bed emergency room. Emergency medical service (i.e., ambulance) is provided by several private companies (Palomar Hospital, 2002; Palomar 2001a, page 5.8-6).

FISCAL

The PEP will be owned by Palomar Energy, LLC, a private company. The proposed project will supply power under contract to the California Department of Water

Resources. The applicable local agencies with taxing powers include the City of Escondido and San Diego County. Their current and projected revenues are indicated in **SOCIOECONOMICS TABLE 5** below.

SOCIOECONOMICS TABLE 5
Escondido and San Diego County Annual Budget

	2000-2001	2001-2002
City of Escondido	$54.1 Million	$57.5Million
San Diego County	$3.03 Billion	$3.77 Billion
Sources: City of Escondido Operating Budget, 2002; County of San Diego-Operational Plan, 2000-2001, 2002-2003		

IMPACTS

Staff reviewed the PEP Application for Certification (AFC) 2001, and three sets of data responses in 2002 (Palomar 2001a, 2002a-c). The applicant used appropriate public databases in the analysis contained in the AFC. Staff's analysis is based on verified information from the AFC and independent research.

EMPLOYMENT AND ECONOMY

During the engineering, procurement, and construction periods extending 21 months, peak employment at the proposed project site would be 321 workers, including 283 craft workers and 28 contractor staff. The peak construction employment of 321 represents a small proportion of all construction jobs in San Diego County (.004 percent), and within the City of Escondido (.06 percent). Staff does not expect any difficulty in finding a construction labor force within commute distance for the proposed project, and few if any workers would be expected to relocate to the Escondido area or San Diego County as a result of the project. Estimated construction payroll would be $67 million. Secondary jobs for local workers in other services and trades would likely be created during the construction period (Palomar 2001a, page 5.8-13). The applicant utilized the IMPLAN Input-Output economic model to determine secondary employment that would be generated during construction and operation of the PEP. It is estimated that 490 and 3 secondary jobs would be generated during construction and operation respectively (Palomar 2001a, pages 5.8-14& 5.8-15). Staff concurs with the use of the IMPLAN model and the resulting employment estimates.

SOCIOECONOMICS TABLE 6 shows the maximum number of craftworkers who would be employed at one time by the proposed project during construction. The maximum number of workers for all trades would not occur on-site simultaneously. During the site preparation and construction periods of approximately 21 months, average employment at the proposed project site would be 227 workers, consisting of craft workers and contractor staff.

TABLE 6
NUMBER OF WORKERS, BY CRAFT

Trade	Total Workers Available In San Diego County – (1997)	Total # of Projected Workers in San Diego County (2004)	Maximum # of Workers Needed for the Project
Welders	1,980	2,210	40
Carpenters, Bricklayers, and Masons	8,450	10,790	35
Electricians	4,890	6,240	36
Ironworkers	NA	NA	23
Laborers	19,650	24,150	48
Millwrights	140	150	22
Equipment Operators	23,870	28,760	17
Plasterers/ Cement Masons	700	970	6
Pipe Fitters	3,970	4,870	48
Sprinklerfitters	NA	NA	9
Sheetmetal Workers	1,640	1,710	14
Surveyors	990	1,230	8
Teamsters	NA	NA	2
TOTAL	66,280	81,693	308
Source: Adapted from Palomar 2002a, Table 5.8-8			

SOCIOECONOMICS TABLE 4, above, shows a strong construction sector and labor force in San Diego County as a whole.

The permanent employment associated with operation of the proposed project is approximately 20 full-time workers, with an estimated annual operational payroll of $2 million. Twenty workers from the large labor force within San Diego County will not have a significant impact on unemployment or the availability of labor. Approximately $3 million would be spent locally on operating supplies generating $350,000 to 400,000 in sales tax that would go to San Diego County, state and local jurisdictions, and special districts (Palomar 2001a, page 5.8-16). The proposed project would not result in any permanent long-term employment generation, which could result in population increase. Staff concludes that there would be no project-induced population growth impacts. In addition, staff recommends Condition of Certification **SOCIO-1** to ensure that local labor is employed for the proposed project.

HOUSING

A small percentage of construction workers may choose to commute on a weekly basis and would require temporary housing. There is a 2.7 percent vacancy rate in the City of Escondido, and a 4.4 percent vacancy rate in San Diego County. There are approximately 1,233 housing units within the City of Escondido should the need arise. As noted earlier, there are adequate hotel/motel and recreational vehicle parks and campgrounds within the local project vicinity to accommodate these workers. It is not anticipated that project construction activities would contribute to a significant increase in the population of the project area during the 21 month period.

Construction of the proposed PEP will not displace existing housing. Construction and operation would occur at the existing Palomar Energy Plant site. No residences are located on the project site. In addition, no replacement housing would have to be constructed as a result of the proposed project. No additional land would be required and no displacement of the occupants of existing residential properties would occur.

Staff concludes that the proposed project would not result in displacement or replacement housing impacts.

SCHOOLS

Because of the large resident labor force available for construction and small permanent labor force that will operate the proposed project, there will be little if any enrollment impacts on the Escondido School Districts. Based on a total of 18,000 square feet of covered and enclosed space and an assessment of $0.33 per square foot, a one-time school impact fee of $5,940 will be generated by the project (Palomar 2001a, page 5.8-15). See Condition of Certification **SOCIO-2**.

UTILITIES, EMERGENCY AND OTHER SERVICES

SDG&E will provide natural gas via an existing distribution line, as well as electricity to the PEP for initial start-up. Once the facility is operating, it will use some of the power generated to run the facility. Reclaimed Water for the proposed facility will be provided by the City of Escondido's Hale Avenue Resource Recovery Facility. Potable water for the project will be provided by the Rincon del Diablo Municipal Water District. Wastewater for sanitary purposes will be treated at the Hale Avenue Resource Recovery Facility. New pipelines will be needed to provide reclaimed water to and remove wastewater from the PEP to the Hale Avenue Facility.

The project owner will provide on-site security. Project construction and operation may result in a small number of increased calls to the Escondido Police and Fire Departments (see **Worker Safety and Fire Protection** section of the PSA for more information). The Police Department staff does not expect the PEP will require any additional officers or equipment, and consequently, there will not be a significant impact on law enforcement services and response times (City of Escondido 2002a).

FISCAL

The construction cost for plant and equipment for the PEP is estimated to be $350 million (Palomar 2001a, AFC, page 8.8-9-). Construction of the proposed project will entail the purchase of $40 million worth of materials and equipment in the local area, which will generate about $2 million in annual sales tax revenue during the construction period (Palomar 2001a, page 5.8-14).

The annual operation payroll would be approximately $1.7 million a year. In addition, the annual maintenance budget would be approximately $3 million (PEP 2001a). The applicant has yet to provide staff an estimate of the assessed value of the PEP after operation has begun. However, based on a 1.0 percent property tax rate, plus any existing bonds or special assessments, and assuming a facility assessed value of $230 million, the tax rate area where the plant is located would receive approximately $2.3 million annually in property tax revenues.

Under a law recently signed by the Governor, AB 81, the responsibility for property tax assessment of the PEP property and other large power plant properties will shift from the County Assessor to the State Board of Equalization (BOE) by making them "state assessed properties." This will require annual reassessment at fair market value, and provide that property tax collected be distributed exclusively to the taxing jurisdictions

within the Tax Rate Area in which the facility is located. (A "Tax Rate Area" is a grouping of properties within a county wherein each parcel is subject to the taxing powers of the same combination of taxing agencies). While AB 81 could substantially increase total property tax revenue derived from the PEP over its lifespan, local governments, schools and other special districts in the PEP Tax Rate Area will continue to receive the property tax revenue from the property at the same percentage of the total that they currently receive from property that is locally assessed by the County Assessor in that same Tax Rate Area.

The BOE's has amended its Rule 905 (Assessment of Electric Generation Facilities) to provide that, as of January 1, 2003, and commencing with the lien date for the 2003-04 fiscal year, electric generation facilities 50 megawatts or larger, owned or used by an electrical corporation, as defined in the Public Utilities Code, will be assessed by the State.

CUMULATIVE IMPACT

Prior to the construction of the PEP, a significant amount of grading, blasting and fill removal will take place throughout the Escondido Research and Technology Center (ERTC) industrial park area. Earthmoving activities are expected to begin in 2003 with full build-out of the Technology Center expected by 2008. Approximately 35 to 40 workers would be involved in the grading and related work on the PEP site, which is expected to last about three months. The local work force in Escondido and San Diego County should be adequate for these activities. The construction payroll is estimated at $500,000 and approximately 100 short-term indirect jobs would be generated (Palomar 2001a, page 5.8-19). Since the earthmoving activities are labor intensive, materials and equipment purchases will be minimal. Staff believes there will be some overlap with the construction of the PEP and the ERTC. However, the large local labor force will be able to provide workers for both projects. Ultimately, the construction of the industrial park could have direct and indirect impacts on population, schools, housing supply, and other socioeconomic factors.

The only other projects in the local area involve the construction of two small gas turbine power plants, one of which is located adjacent to the PEP site while the other is about 0.5 mile northwest. Both plants are operating at this time. Staff does not anticipate any operational impacts from the PEP and ERTC.

Since the proposed project would not result in any significant adverse socioeconomic impacts on population, housing and public services, it is not expected to contribute to cumulative socioeconomic impacts in the Southern California region.

ENVIRONMENTAL JUSTICE SCREENING ANALYSIS

The purpose of the environmental justice screening analysis is to determine whether there exists a low-income and/or minority population within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with the “Final Guidance for Incorporating Environmental Justice Concerns in EPA’s NEPA Compliance Analysis” (Guidance Document) dated April 1998. Minority (people of color) populations, as defined by this Guidance Document, are identified where either:

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

Energy Commission staff has determined the potential affected area as a six-mile radius of the proposed PEP site. The six-mile radius is consistent with the radius used for staff's cumulative air quality analysis. When a people of color and/or low-income population is identified per the above, staff in the technical areas of air quality, public health, hazardous materials, noise, water, waste, traffic and transportation, visual resources, land use, socioeconomics and transmission line safety and nuisance consider possible impacts on the people of color/low-income population as part of their analysis. This "environmental justice" (EJ) analysis consists of identification of significant impacts (if any), identification of mitigation, and determination of whether there is a disproportionate impact if an unmitigated significant impact has been identified. Staff's environmental justice approach includes providing notice (in appropriate languages) of the proposed project and opportunities for participation in public workshops to people of color and/or low-income communities, and providing information on staff's EJ approach to minority and/or low-income persons who attend staff's public workshops.

SOCIOECONOMICS FIGURE 1 identifies census blocks within six miles of the proposed project that had people of color populations greater than 50 percent. Census 2000 data indicate that the minority population within the six-mile radius of the project site is 44 percent. However, there are several census blocks with a people of color population greater than 75 percent. Staff considers these areas to be pockets of predominately people of color populations, therefore various technical staff have considered environmental justice impacts in their analyses.

In 1990, the percentage of the population living below the poverty level was 10.3 percent within a six-mile radius of the PEP. As noted above, comparable data from the 2000 census is not yet available. However, 2000 data for counties and cities show that In December of 1999, the number of individuals living in poverty in San Diego County, the City of Escondido, and the City of San Marcos were approximately 12.5, 13.4, and 12.0 percent respectively (U.S. Census Bureau, Census 2000). These numbers are well below the 50 percent threshold discussed above.

Although people of color and low-income populations exist in the vicinity of the proposed power plant site, staff has not identified any significant unmitigated adverse socioeconomic effects associated with the proposed project. Therefore, there are no socioeconomic environmental justice issues.

MITIGATION

Energy Commission staff has identified economic and fiscal benefits to the project area such as employment, project expenditures and sales and property tax revenues. To ensure that the local area benefits from the project, staff is proposing a condition of

certification that will lead to local employment and project-related expenditures (Condition of Certification **SOCIO- 1**). A condition is proposed to ensure that the project owner pays the City of Escondido School District a one-time school impact fee, estimated to be $5,940 (Condition of Certification **SOCIO-2**).

CONCLUSIONS AND RECOMMENDATIONS

Staff believes that the PEP would not cause a significant adverse direct or cumulative impact on housing, schools, employment, public finance, or public services. The proposed project would not induce significant population growth in the area, nor would it involve the displacement of housing or people. In addition, the project will not significantly impact schools or public services. Therefore, the project will not result in any significant socioeconomic impacts to population, housing, schools, or public services. In addition, the PEP is compatible with the City of Escondido General Plan and, in particular, the Escondido Research and Technology Center Specific Plan (See the **Land Use** section of this assessment for more detail).

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 San Diego County unless:

a) to do so will violate federal and/or state statutes;

b) the materials and/or supplies are not available;

c) 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 CPM copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM by letter of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months.

SOCIO-2: The project owner shall pay the one-time statutory school facility development fee as required at the time of filing for the in-lieu building permit with the City of Escondido 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.

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SOIL & WATER RESOURCES

Joe Crea and Richard Latteri

INTRODUCTION

This section analyzes the potential effects on soil and water resources by the Palomar Energy Project (PEP) as proposed by Palomar Energy, LLC (Applicant). The analysis specifically focuses on:

- whether construction or operation will lead to accelerated wind or water erosion and sedimentation;
- whether the project will exacerbate flood conditions in the vicinity of the project;
- whether the project's demand for water will adversely affect surface or groundwater supplies;
- whether project construction or operation will lead to degradation of surface or groundwater quality; and
- whether the project will comply with all applicable laws, ordinances, regulations and standards.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Clean Water Act (CWA)

The Clean Water Act (33 U.S.C. Section 1251 et seq.) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCBs).

Section 401 of the Clean Water Act requires that any activity that may result in a discharge into a water body must be certified by the Regional Water Quality Control Board so that the proposed activity will not violate state and federal water quality standards.

Section 403 of the Clean Water Act establishes responsibilities of Federal, State, and local government, industry and the public to implement National Pretreatment Standards to control pollutants which pass through or interfere with treatment processes in Publicly Owned Treatment Works (POTWs) or which may contaminate sewage sludge.

Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers (ACOE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. The ACOE issues site-specific or general (Nationwide) permits for such discharges.

Section 423 of the Clean Water Act is applicable to discharges resulting from the operation of a generating unit by an establishment primarily engaged in the generation of electricity for distribution and sale which results primarily from a process using fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium.

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. Those criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures. Water quality criteria for the project area are contained in the Water Quality Control Plan for the San Diego Basin (1994 update to the *San Diego Region Basin Plan*). This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes to the state's waters and land. Those standards are applied to the proposed project through the Waste Discharge Requirements (WDRs) permit.

California Water Code

Section 13552.6 of the Water Code specifically identifies that the use of potable domestic water for cooling towers, if suitable reclaimed water is available, is an unreasonable use of water. The availability of reclaimed water is determined by the SWRCB based on criteria listed in Section 13550. Those criteria include provisions that the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and will not impact downstream users or biological resources.

Section 13552.8 of the Water Code states that any public agency may require the use of reclaimed water in cooling towers if reclaimed water is available, meets the requirements set forth in Section 13550, that there will be no adverse impacts to any existing water right, and that if public exposure to cooling tower mist is possible, appropriate mitigation or control is provided.

STATE POLICIES

State Water Resources Control Board (SWRCB)Resolution 75-58

The SWRCB has adopted policies that provide guidelines for water quality protection. The principal policy of the SWRCB which specifically addresses the siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (adopted by the Board on June 19, 1975, as Resolution 75-58). This policy states that fresh inland waters should only be used for power plant

cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy requires that power plant cooling water should come from, in order of priority: wastewater being discharged to the ocean; ocean water; brackish water from natural sources or irrigation return flow; inland waste waters of low total dissolved solids; and other inland waters. The policy also addresses cooling water discharge prohibitions such as land application.

Tertiary Wastewater Treatment permit

Under Title 22 of the California Code of Regulations, the California Department of Health Services (DHS) reviews and approves wastewater treatment systems to ensure they meet tertiary treatment standards allowing use of recycled water for industrial processes such as steam production and cooling water.

LOCAL

City of Escondido

The City of Escondido, in accordance with Ordinance 95-8, requires that industrial dischargers obtain an Industrial User Permit, develop a Management Plan for toxic and prohibited organic chemicals, and complete a Baseline Monitoring Report. In addition, the power plant is subject to the wastewater pretreatment standards defined in 40 CFR Part 403 (general pretreatment standards) and Part 423 (categorical standard).

The City of Escondido requires Grading and Erosion Control (Chapter 33, Article 55) permits that include stormwater design standards and encroachment permits for construction of reclaimed water, brine return, and natural gas pipelines.

ENVIRONMENTAL SETTING

SITE AND VICINITY DESCRIPTION

Palomar Energy, LLC proposes to build the Palomar Energy Project, a nominal 500 MW combined cycle power plant, on a vacant 20-acre site within the planned 186-acre Escondido Research and Technology Center (ERTC) in the city of Escondido, California. The ERTC Specific Plan is currently undergoing CEQA review by the City of Escondido and is expected to be considered by the City this fall. Approval of the Specific Plan is a prerequisite for Energy Commission approval of the PEP.

Development of the ERTC site will result in eight planning areas each on a graded pad as shown in Project Description Figure 3. Existing elevations on the undeveloped site range from approximately 630 feet to 880 feet above mean sea level (msl) sloping downward towards the southwest (Palomar 2001a).

The proposed PEP site, which is within the ERTC, is designated as Planning Area 1, a 20-acre parcel that subsumes a 14.1-acre pad. Existing elevations of Planning Area 1 range from approximately 740 feet to 820 feet msl and consist of three contiguous areas: a central graded area at an existing elevation of about 790 feet msl; a cleared slope that was formerly an avocado and citrus grove to the north; and naturally vegetated slopes to the south. The site is bounded on the north by the 49 MW CalPeak

Powerplant; on the east by existing industrial land uses; on the south by future industrial land uses within the planned ERTC industrial park; and on the west by an existing San Diego Gas and Electric (SDG&E) transmission corridor (Appendix A, Escondido Research and Technology Center Specific Plan, 2001).

The project vicinity is dominated by urban development. Industrial parks and other heavily urbanized landscapes occupy the area immediately to the east of the ERTC site and extends for several miles towards the center of the City of Escondido. Rural development, eucalyptus groves, and fallow agricultural fields dominate land uses to the south and southwest of the site. The most prominent drainage feature within the vicinity of the ERTC site is Escondido Creek which traverses areas to the southeast and south of the site. Most of Escondido Creek to the southeast of the ERTC is concrete lined.

The PEP site is located is northwestern San Diego County, an area of warm, dry summers and mild winters. The topography of this region consists of narrow winding valleys and rolling to hilly uplands that are traversed by several rivers and small creeks. Most precipitation occurs during the months of December through April and is infrequent in summer. Precipitation reported by the Miramar Naval Air Station, approximately 15 miles south of Escondido, averages about 10.6 inches per year. The flow of surface water and groundwater in the area is in an east-to-west direction toward the Pacific Ocean. Temperatures in the project area range from an average low of 43ºF during December and January to an average high of 82ºF in August (The Weather Channel 2002).

SOILS

Soils in the vicinity of the project site have been formed from the decomposition of the bedrock and are soft and easily eroded. The bedrock in the area is a granitic rock identified as Green Valley Tonalite and occurs as fractured blocks 2 to 10 feet across. After weathering, the bedrock leaves a bouldery surface surrounded by weathered and decomposed granitic material. Soil on the PEP site is comprised of Vista coarse sandy loam, a moderately erodible soil that has a moderate infiltration rate. Vista coarse sandy loam is moderately to well drained, exhibits low shrink-swell behavior and is of low fertility.

Soil types present along the proposed gas and water pipeline routes include Vista course sandy loam, Fallbrook sandy loam, Cinebac rocky coarse sandy loam, Placenta sandy loam, Ramona sandy loam, and Visalia sandy loam. The depths, permeability, erosion potential, and shrink-swell behavior of those soils are described in Table 5.6-1 of the AFC and their locations identified on Figure 5.6-2 (Palomar 2001a).

SURFACE WATER

The PEP site lies within the San Diego Hydrologic Basin and is located within the Carlsbad Hydrologic Unit as part of the Escondido Creek Hydrologic Area. The Carlsbad Hydrologic Unit comprises a 210-square-mile area, which includes unique coastal lagoons, lakes, creeks, and urban and natural drainages which support native vegetation, open spaces, agriculture and fisheries (Palomar 2001a).

Local Surface Water

Escondido Creek flows through Lake Wohlford, which is northeast of Escondido, and then through the City of Escondido. This watercourse eventually discharges into the Pacific Ocean at San Elijo Lagoon. Most of Escondido Creek within the City of Escondido has been concrete-lined since the late 1960s. In the project area, the concrete lined creek extends in a northeasterly to southwesterly direction approximately 0.75-miles south of the site.

Existing beneficial uses for Escondido Creek include municipal and domestic supply, agricultural supply, contact water recreation, non-contact water recreation, warm freshwater habitat, cold freshwater habitat, and wildlife habitat (Palomar 2001a).

Imported Water

Depending on local weather conditions, typically 75 to 95 percent of San Diego County's water is imported. In 2000, imported water sources provided 84 percent of the total water used. Imported water is currently obtained by the Metropolitan Water District of Southern California (MWDSC) from the Colorado River through their 242-mile Colorado River Aqueduct. Water from northern California is imported by MWDSC via the 444-mile California Aqueduct (Palomar 2001a).

Reclaimed Water

Reclaimed water is an important and growing component of the area's water supply. Reclaimed water is obtained through treatment of municipal wastewater to produce a safe and reliable water supply for nonpotable uses. The San Diego County Water Authority (SDCWA) currently provides 12,000 acre-feet of reclaimed water for use in their service area. SDCWA estimates that the total reclaimed water use in their service area will increase to 50,000 acre-feet per year when planned water reclamation projects are completed in the year 2020 (San Diego County Water Authority 2002).

GROUNDWATER

The PEP site is located in the San Diego Hydrologic Basin, which occupies approximately 3,900 square miles of San Diego County and portions of Orange and Riverside counties in southwestern California. This hydrologic basin lies within the Peninsular Ranges physiographic province. This geographic area is characterized by a relatively narrow coastal plain and east to westward trending inland mountains and steep-walled, narrow valleys.

All major drainage basins within the San Diego Hydrologic Basin contain groundwater. The groundwater basins are relatively small in area and usually shallow. Although the basins are limited in size, their groundwater yield has been historically important to the development of the area. However, most of the groundwater in the area has been extensively developed and the availability of potential future uses is limited.

Beneficial uses for the groundwater in the Escondido Creek Hydrologic Area include municipal and domestic, agricultural, and industrial service supply. Unless otherwise designated by the San Diego Regional Water Quality Control Board (SDRWQCB), all groundwater in the area is considered suitable or potentially suitable as sources of drinking water (Palomar 2001a).

According to the applicant, groundwater could be encountered approximately 20 feet below ground surface (bgs). During a site-specific geotechnical investigation, bedrock was encountered 6 to 11 feet below ground surface at which excavations/borings were terminated and no groundwater was encountered. Groundwater flows to the southwest in the general direction of Escondido Creek (Palomar 2001a).

PROJECT WATER SOURCES

PEP Water Supply

The Palomar Energy Project proposes to use reclaimed water supplied by the City of Escondido for process water and wet cooling. Approximately 3.6 million gallons per day (mgd) of tertiary treated reclaimed water will be provided by the City's Hale Avenue Resource Recovery Facility (HARRF). The constituents of the reclaimed water are shown below in **Soil and Water Resources Table 1**. Environmental reviews for upgrading and expansion of the HARRF for production of 18.0 mgd of secondary treated wastewater have been completed. As part of the HAARF upgrade, the Escondido Regional Recycled Water Project (ERRWP), currently under construction, will have the capacity to provide 9.0 mgd of tertiary treated reclaimed water. The proposed startup date for the ERRWP is projected to occur during the second half of calendar year 2002.

Soil & Water Resources Table 1
HARRF Reclaimed Water Quality

Constituents	*Average Concentration*
Calcium	229 mg/L
Magnesium	118 mg/L
Sodium	384 mg/L
Potassium	21 mg/L
Total Alkalinity	246 mg/L
Sulfate	254 mg/L
Chloride	326 mg/L
Nitrate	2 mg/L
Silica	5 mg/L
Total Dissolved Solids	973 mg/L

Source: Palomar 2001a, AFC Table 2.4-3,

The PEP's various water uses include makeup water for the circulating water system, the steam generators, and the evaporative coolers. Additional water is required for service water, potable water, and fire protection. The average annual water requirements are presented in **Soil and Water Resources Table 2** based on 16 hours of peak load operation per day for the four month period of June through September and base load operations during all other hours. The small quantity of potable water proposed by the project will be provided by the Rincon del Diablo Municipal Water District.

Soil and Water Resources Table 2
Daily and Annual Water Requirements of the Palomar Energy Project

Water Use	***Daily Requirements (gallons)***	***Annual Requirements (acre-feet)***
Circulating Water System Makeup	3,498,700	3,516
Demineralized Steam Generator Makeup	41,100	41
Evaporative Cooler Makeup	45,800	49
Service Water	14,400	16
Potable Water	1,400	2
TOTAL	**3,601,400**	**3,624**

Source: Palomar 2001a, AFC Table 2.4-2

As proposed, the PEP will have a 730,000 gallon raw water storage tank. A dedicated supply of 200,000 gallons will be available for fire protection with the remaining 530,000 gallons available for emergency plant operation and peak demand regulation. The 530,000 gallons is sufficient to cover a 4-hour water supply interruption at maximum plant load. The Applicant proposes no back-up water source (Palomar 2001a).

Staff's Soil and Water Resources Data Request 48 asked the Applicant to provide a discussion of their contingency plan in the event of a disruption of reclaimed water supply longer than four hours. The Applicant responded with "the Palomar project does not have a backup cooling water supply source. Thus, if a HARRF outage lasts longer than four hours, the Palomar plant would have to shut down when the on-site water supply is exhausted. However, because of the importance of protecting public health and safety municipal waste water treatment plants, such as the HARRF, are designed to provide reliable service" (Palomar 2002c).

PROJECT RELATED IMPACTS

DIRECT AND INDIRECT IMPACTS

Project Description

The Palomar Energy Project consists of a proposed 500 MW natural gas-fired combined cycle power plant and associated natural gas, reclaimed water supply, and brine return pipelines. Major components of the plant include two Combustion Turbine Generators (CTGs), one Steam Turbine-Generator (STG), two Heat Recovery Steam Generators (HRSGs), one plume-abated wet cooling tower, operations building, and a new 230 kV switchyard. The switchyard will be connected to an existing SDG&E transmission line located to the west of the project site. No new transmission lines will be required.

Primary access to the site is provided by a new 30-foot wide, 200-foot long paved road extending across the SDG&E transmission corridor from the future Citracado Parkway at the south end of the site. Secondary access to the site is provided by a new 20-foot wide, 200-foot long paved road also extending across the SDG&E transmission corridor

from the future Citracado Parkway but at the north end of the site. The site access roads are shown in Project Description Figure 2.

Natural gas will be delivered to the site by SDG&E from a gas pipeline located immediately adjacent to the project site. The reclaimed water supply pipeline, as shown on Project Description Figure 2, will connect with the ERRWP pipeline at Harmony Grove Road just north of Escondido Creek. The pipeline will be a new 1.1- mile, 16-inch supply pipeline extending from an existing 24-inch reclaimed water supply main extending northeast from the HARRF along Escondido Creek. Brine from the project will be returned to the HARRF via a new 1.1-mile, 8-inch return pipeline routed alongside the reclaimed water supply pipeline and connecting to an existing brine return line at the same location as the reclaimed water supply line.

Upon full completion of the ERRWP, it is expected that the HARRF will have a total capacity of approximately 9.0 mgd of reclaimed water. HARRF effluent is discharged to the Pacific Ocean via a 14-mile pipeline that connects to an ocean outfall pipeline near San Elijo Lagoon. The effluent exits the outfall pipeline approximately 2.0 miles offshore through diffuser ports 132 feet deep. The PEP site, the route of the reclaimed water supply pipeline, and brine return pipeline are shown on Project Description Figure 2 (Palomar 2001a, & App. A, Escondido Research and Technology Center Specific Plan).

SOIL

Erosion Control and Stormwater Management

Power Plant Construction and Operation

Following completion of mass grading of the Escondido Research and Technology Center, on-site construction of the PEP will begin. The PEP site will be located on a 20-acre parcel of the ERTC. As noted above, the ERTC Specific Plan is currently undergoing a separate CEQA review by the City of Escondido.

In creating the pad for Planning area 1, approximately 735,000 cubic yards of material (rock and soil) will be excavated and 2,000 cubic yards of material filled resulting in a 14.1-acre power plant pad at an elevation of about 750 feet msl. The net excavated materials from Planning Area 1 will be used as fill in other portions of the ERTC. The power plant pad will sit in a bowl surrounded on three sides by earthen berms with heights ranging from 20 to 70 feet. South of the project site (unbermed side) in Planning Area 2, an additional 18 acres will be used as the laydown and staging area for PEP construction (Appendix A, Escondido Research and Technology Center Specific Plan).

It is expected that portions of the excavated site will consist of exposed bedrock with loose soil remaining in the low areas and at the base of the berms. In this disturbed condition, accelerated wind and water-induced erosion may result from the earthmoving activities associated with the PEP construction. Without stabilization, physical erosion related to wind and water may continue to erode unprotected surfaces during project operation.

Earthwork at the site will consist of excavation for foundations and underground systems as well as final grading of the site. Subsequent soil disturbances during construction are expected to result in short-term increases in water and wind erosion. Project design and the Storm Water Pollution Prevention Plan (SWPPP) will include measures to stabilize cut and fill slopes and to control drainage and erosion. The SWPPP is discussed under Proposed Mitigation later in this section (Appendix A, Escondido Research and Technology Center Specific Plan; Palomar 2001a; and Palomar 2002c).

Pipeline Construction

Temporary disturbances related to construction of the water pipelines are expected to occur but will be minimal and short-term. The reclaimed water and brine return pipelines will use the same trench and be installed underground. Approximately half of the proposed 1.1-mile pipeline route will be along existing roadways resulting in no new soil disturbances. The remaining portion of the pipeline route will be located within the 186-acre Escondido Research and Technology Center, which will be disturbed prior to PEP construction if the City of Escondido approves the ERTC. Trenching for pipeline installation and vehicular travel within the construction right-of-way will temporarily disturb soils and potentially increase wind and water erosion. Appropriate erosion and fugitive dust control measures will be implemented during construction; therefore, no significant soil impacts are expected (Palomar 2001a; and Palomar 2002c).

Roads

Impervious surfaces can cause increased runoff that may eventually lead to accelerated erosion in unprotected areas. Construction of the proposed project would result in soil compaction from paving and from vehicle traffic along access roads and equipment storage areas. Access to the site is provided by two new access roads. The primary access road crosses the SDG&E transmission corridor from the future Citracado Parkway, entering the site at the south end. The secondary access road also crosses the SDG&E transmission corridor from the future Citracado Parkway, entering the site at the north end. A 20-foot wide paved loop road provides access to the power plant facilities. Paving also includes a parking lot and roads encircling the turbine-generator and HRSG areas.

The Applicant has provided a draft SWPPP that identifies potential temporary and permanent Best Management Practices (BMPs). This plan and its provisions are discussed under Proposed Mitigation later in this section (Appendix A, Escondido Research and Technology Center Specific Plan; Palomar 2001a; and Palomar 2002c).

SPILL PREVENTION

The PEP draft Spill Prevention Control and Countermeasure (SPCC) Plan covers chemical spill control and management of the hazardous materials that will be stored and used on-site. As described in the draft SWPPP, hazardous materials at the PEP would be stored indoors in watertight containers and/or surrounded by secondary containment structures. Bermed containment will be used in areas used for bulk hydrocarbon storage. Some of the hazardous materials used during construction include petroleum hydrocarbons, cleaning fluids and solvents. For more information on

hazardous materials, please see the **Hazardous Materials Management** section of this Preliminary Staff Assessment.

Acutely hazardous materials stored on-site during operation of the proposed PEP facility include sulfuric acid and aqueous ammonia. Those materials would be stored in above ground storage tanks that would be surrounded by curbed concrete containment basins. Other containment/treatment facilities include berms, concrete sumps, and an oil/water separator. Staff does not expect significant impacts to result from on-site spills (Palomar 2001a; and Palomar 2002b).

STORMWATER RUNOFF

Prolonged periods of precipitation, or high-intensity, short-duration runoff events coupled with earth disturbance activities can cause on-site erosion resulting in an increased sediment load to the City of Escondido's stormwater drains and/or Escondido Creek. The PEP will contribute water to downstream drainage facilities; however, those facilities were sized to accommodate the drainage from the Palomar project.

Proposed surface drainage systems for the project are designed for stormwater runoff resulting from a 50-year, six-hour rainfall event. The project site will drain in a southerly direction, and non-contact stormwater will be directed and discharged to the City of Escondido's storm drain system. The plant drainage systems also will prevent flooding of permanent plant facilities.

The PEP is required to implement drainage control measures to ensure the velocity and volume of water discharged during a storm event does not exceed the City's existing storm drain capacity. Those requirements are incorporated into the design plan and the draft SWPPP, and no significant impacts from soil erosion or sediment loading to surface waters are expected (Palomar 2001a; and Palomar 2002c).

GROUNDWATER

According to the geotechnical study within Appendix C of the AFC, excavation cuts during earthmoving will occur to approximately 60 feet below existing grade. As mentioned earlier, groundwater may be encountered within 20 feet of the ground surface but the borings taken during the geotechnical investigation were terminated at approximately 11-feet bgs when bedrock was encountered. Phase I Environmental Site Assessment (ESA) results do not identify any contamination, so existing groundwater contamination appears unlikely. Therefore, no handling and storage of contaminated groundwater are anticipated. Since potential groundwater encountered during excavation could impact construction activities via runoff and seepage, staff has provided a mitigation measure for proper handling and storage of any groundwater. Please refer to the Staff Recommended Mitigation Measures section.

WATER SUPPLY

The PEP proposes to use reclaimed water supplied by the City of Escondido for process water and wet cooling. Approximately 3.6 million gallons per day (mgd) of tertiary treated reclaimed water will be provided by the City's Hale Avenue Resource Recovery Facility (HARRF). As part of an ongoing upgrade to the HAARF, the

Escondido Regional Recycled Water Project (ERRWP) will have the capacity to provide 9.0 mgd of tertiary treated reclaimed water.

The PEP's various water uses include makeup water for the circulating water system, the steam generators, and the evaporative coolers. Additional water is required for service water, potable water, and fire protection. The average annual water requirements are presented in **Soil and Water Resources Table 2**. With completion of the ERRWP in the second half of 2002, the HARRF will have ample capacity to provide tertiary treated source water to the project. As the expected ultimate capacity of the ERRWP will be approximately 9.0 MGD of reclaimed water, the power plant's requirements will not impact other potential users of ERRWP reclaimed water.

The 1,400 gallons per day of potable water supplied to the project by the Rincon del Diablo Municipal Water District will have no impact on the availability of water for other users (Palomar 2001a;and Palomar 2002c).

WASTEWATER DISCHARGE

Water Quality and Wastewater Discharges

Wastewater is segregated into two separate collection systems. The first is the brine system which collects process wastewater produced from the plant equipment including the cooling tower, HRSGs, CTG evaporative coolers, and demineralization system and delivers it to the circulating water system in the cooling tower basin. The concentrated cooling tower blowdown (brine) is then delivered to the City of Escondido's HARRF. The second system is the sanitary system, which collects wastewater from the sanitary facilities and combines it with effluent from the plant's neutralization tank and general plant drainage and delivers it to the City of Escondido's sewer system. **Soil & Water Resources Table 3** summarizes the types and quantities of operational wastewater to be generated by the power plant. There will be no discharge of wastewater from the power plant to surface waters or groundwater.

Soil & Water Resources Table 3
Project Wastewater Volumes

Wastewater Type	***Estimated Quantity (gallons per day)***	***Operational Process***
Cooling Tower Blowdown	889,000	Blowdown from cooling tower, evaporative cooler, HRSG units, and deionization system
Sanitary Wastewater	15,840	Sanitary wastewater, potable water drains, and discharge from oil/water separator

Source: Appendix A, Escondido Research and Technology Center Specific Plan

The City of Escondido, in accordance with Ordinance 95-8, requires that industrial dischargers obtain an Industrial User Permit, develop a Management Plan for toxic and prohibited organic chemicals, and complete a Baseline Monitoring Report. In addition to Ordinance 95-8, the PEP is subject to the wastewater pretreatment standards defined in

40 CFR Part 403 (general pretreatment standards) and Part 423 (categorical standard). The general standards in 40 CFR Part 403 prohibit introducing:

- pollutants that create a fire or explosion hazard;
- pollutants that may cause corrosive structural damage to a publicly owned treatment works (POTW), but in no case discharges with a pH lower than 5.0, unless the POTW is specifically designed to accommodate such discharges;
- solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW;
- any pollutant, including oxygen-demanding pollutants, released at a flow rate and/or pollutant concentration which will cause interference with the POTW (in this case the HARRF);
- heat in amounts that will inhibit biological activity in the POTW;
- petroleum oil; and
- pollutants that result in the presence of toxic gases, vapors, or fumes.

The standards defined in 40 CFR 423 are applicable to facilities primarily engaged in the generation of electricity for distribution and sale, whose wastewater results from a process using fossil fuel in conjunction with a thermal cycle employing a steam water system as the thermodynamic medium. For new sources discharging to a publicly owned treatment works, those standards require that:

- there be no discharges of polychlorinated biphenyl compounds;
- discharges of chemical metal cleaning wastes (wastewater resulting from cleaning any metal process equipment, including boiler tube cleaning) may not contain total copper in concentrations that exceed 1.0 mg/L maximum for one day; and
- the quantity of pollutants discharged in cooling tower blowdown may not exceed the concentrations listed in **Soil and Water Resources Table 4**.

Soil & Water Resources Table 4
Pretreatment and Categorical Standard

Pollutant	*Pretreatment Standards Maximum for 1 Day (mg/L)*
126 Priority Pollutants[1] contained in chemicals added for cooling tower maintenance, except:	Nondetectable
total Chromium	0.2
total Zinc	1.0

(1)Contained in 40 CFR 423.

Soil & Water Resources Table 5 describes the concentration of brine blowdown returned to Hale Avenue Resource Recovery Facility. The reclaimed water constituents in the cooling and process water supplied by the HARRF are concentrated by the cooling cycle and do not contain any of the 126 priority pollutants identified in 40 CFR 423 and will have no impact on surface waters or groundwater. The values shown below are average concentrations for the planned PEP operation at base and peak loads representing approximately four cycles of concentration (Palomar 2001a; and Appendix A, Escondido Research and Technology Center Specific Plan).

Soil & Water Resources Table 5
Quality of Brine Return to the HARRF

Constituents	*Average Concentration @ Base Load*	*Average Concentration @ Peak Load*
Calcium	924 mg/L	923 mg/L
Magnesium	476 mg/L	475 mg/L
Sodium	1548 mg/L	1547 mg/L
Potassium	93 mg/L	92 mg/L
Total Alkalinity	150 mg/L	150 mg/L
Sulfate	1314 mg/L	1313 mg/L
Carbon Dioxide	1 mg/L	1 mg/L
Nitrate	8 mg/L	8 mg/L
Silica	20 mg/L	20 mg/L
Total Dissolved Solids	3923 mg/L	3920 mg/L

Source: Appendix A, Escondido Research and Technology Center Specific Plan

CONSTRUCTION WASTEWATER

Project construction activities will generate a one-time use of approximately 400,000 gallons of reclaimed water for hydrostatic testing of plant pipelines. This water will be collected in the cooling tower basin and subsequently used in the plant's cooling system and returned to HARRF. Equipment wash water will be discharged at designated wash areas. The wash water will be transported to a wastewater treatment facility by a licensed vacuum truck hauler, and no significant impacts are expected (Palomar 2001a).

Surface Water Quality and Flooding

The project site is composed of several small drainage areas. Approximately 14.1 acres will be used for the PEP generating facilities, with an additional six acres of bermed and landscaped area surrounding the facilities. Design of the 14.1-acre pad will divert stormwater flows from the north end of the site to the south. This diversion is not considered a substantial alteration of existing drainage patterns, nor will it significantly change the amount of surface water runoff to Escondido Creek. An on-site detention basin will store stormwater runoff to mitigate the increase in peak flows. This diversion does not significantly alter the current regional and local drainage patterns. PEP flood-related impacts of the proposed linear facilities are not expected to be significant (Palomar 2001a & Palomar 2002c).

CUMULATIVE IMPACTS

The projects considered in this cumulative impacts assessment consists of the CalPeak Powerplant adjacent to the northern boundary of the PEP site, the RAMCO Powerplant 0.5-miles northwest of the PEP site, and the ERTC Industrial site which includes the PEP site.

The following sections discuss the relevant issue areas and their cumulative impacts.

Erosion Control and Stormwater Management

Construction and operation activities related to the PEP may cause accelerated wind and water erosion. Projects in the vicinity of the PEP include the Calpeak Powerplant, the RAMCO Powerplant, and the remainder of the ERTC site. Implementation of the proposed mitigation measures (including the SWPPP) will ensure that erosion and potential sedimentation would be minimized.

Stormwater runoff typically increases with urbanization and new construction activities. The PEP will cause an increase in stormwater runoff; and accordingly, the proposed stormwater management system has been designed to accept the increased volume. Prior to off-site discharge, all site stormwater will be routed to a detention basin where it will be temporarily stored and released at a rate equal to or less than pre-existing conditions. The applicant is also proposing to minimize off-site run-on by constructing diversion swales. Staff's preliminary determination indicates that project-related flood impacts are not expected, nor are project related cumulative impacts from flooding expected. Therefore, provided the SWPPP is implemented, the PEP project is not expected to cause any significant cumulative erosion or stormwater impacts.

Water Supply

The Palomar Energy Project proposes to use approximately 3.6 mgd of tertiary treated reclaimed water for plant processes and wet cooling. The City of Escondido is expected to have a reclaimed water capacity of approximately 9.0 mgd after completion of the ERRWP, expected later this year. The CalPeak and RAMCO power plants are less than 50-MW, simple-cycle facilities that do not require wet cooling. Water supply for the ERTC construction phases is expected to total five million gallons (25,000 gallons per day) and approximately 2,000 gallons per day during operations. Therefore, the addition of the PEP to the City of Escondido's reclaimed water customers will not contribute cumulative impacts to the City's reclaimed water supply.

Water Quality and Wastewater Discharge

All process water will be delivered to the City's HARRF through the brine return line. Sanitary waste will be discharged to the City of Escondido's sewer system. All processes must comply with Industrial Wastewater Discharge permits and pre-treatment standards. Therefore, the PEP will not contribute to cumulative impacts in the area of water quality or wastewater discharge.

ENVIRONMENTAL JUSTICE

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

Based on the Soil and Water Resources analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project. Therefore there are no Soil and Water Resources environmental justice issues related to this project.

FACILITY CLOSURE

The PEP is expected to operate for a minimum of 30 years depending on its economic viability. An early decommissioning and/or mothballing is also possible. Decommissioning may involve mothballing or removal of all equipment and appurtenant facilities. A decommissioning plan will be submitted to the Energy Commission for approval prior to decommissioning. This plan would comply with all applicable soil and water resources LORS (Palomar 2001a).

COMPLIANCE WITH LORS

Based on staff's preliminary analysis, the proposed PEP will comply with all applicable LORS regarding soil and water resources if the applicant implements staff's recommended mitigation measures and the Conditions of Certification set forth in this assessment.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

Erosion and Sediment Control

The Applicant provided a draft SWPPP that identifies temporary and permanent erosion control and stormwater Best Management Practices (BMPs).

The draft SWPPP identified a number of potential BMPs for the construction and operation of the PEP. The BMPs identified are:

- temporary and permanent diversion strategies;
- temporary and permanent vegetation strategies;
- use of soil stabilizers (i.e. water) as appropriate to minimize dust;
- installation of a sediment/retention basin to minimize off-site discharge of sediments;
- storm drain inlet protection to prevent sediment-laden runoff from entering inlets or catch basins;
- the use of silt fences, straw bale barriers, and fiber rolls to intercept sediment-laden runoff from disturbed soil;
- secondary containment for hazardous material delivery and storage areas to prevent spills or leakage of liquid materials from contaminating soil or soaking into the ground;
- designated storage areas for construction wastes, hazardous materials, paints, and related products along with covered dumpsters and containers for waste and recyclables;
- training of employees on stormwater quality management;
- implementation of a spill prevention and control plan;
- timely removal of construction wastes;
- storage of all liquid wastes in covered containers;
- emergency spill containment kits and materials in areas of potential hazardous materials release; and
- routine maintenance of the oil/water separator system.

STAFF PROPOSED MITIGATION

Erosion and Sediment Control

Energy Commission Staff recommends specific timeframes for submittal of the final SWPPP and Erosion and Sediment Control plan in staff's proposed Conditions of Certification 1 through 4. Erosion control and stormwater management drawings must accompany the narrative portion of the SWPPP. Both the drawings and the narrative

must be detailed, specific, consistent, and include the following elements for the proposed PEP project.

- The topographic features of the proposed project including areas involving all proposed pipeline construction, the 18-acre laydown area, and stockpile location(s). The mapping scale should be 1”= 100’ or less (1”=50’ recommended). The drawings should depict the surrounding area (south and east of site) including the topography and existing features. The drawings should also show existing structures, drainage pipes, and diversion swale(s).
- Soil use limitations associated with construction and revegetation must be acknowledged and resolutions provided to assist the contractor in overcoming any limitation with the soil’s low fertility characteristics. Soil types and other relevant information can be located in the Natural Resources Conservation Services (NRCS) County Soil Survey.
- Proposed contours should be shown tying in with existing ones. All proposed utilities including stormwater facilities should be shown on the plan drawings. All erosion and sedimentation control facilities should be shown on the mapping. The drawings should contain a complete mapping symbols legend that identifies all existing and proposed features including the soil boundary(s) and a limit of construction. The limit of construction boundary should include the project facility, pipeline areas, stockpile areas and laydown areas. The limit of construction ensures all work is confined to the proposed PEP in order to protect all surrounding areas not involved in construction or operation of the proposed project.
- A detailed and specific construction sequence that addresses the entire sequence of events from initial mobilization until final stabilization (e.g. vegetation/asphalt) is achieved.
- Silt fence and haybales, installed on level grade and parallel to the existing contour. If the slope length to the silt fence and haybales exceeds 250 feet, other erosion and sediment control facilities should be used. Silt fence and haybales should be used to trap sediment and not as runoff conveyance or control facilities. Staff highly recommends temporarily converting the stormwater management basin into a sediment basin. The basin would need to be temporarily enlarged to account for sediment and stormwater storage. All site and laydown runoff can be intercepted and diverted into the basin.
- All site-specific BMPs need to be depicted on the erosion and sediment control plan and the stormwater management plan and discussed in the narrative. Details of each BMP facility need to be provided on the drawings.
- Provide all proposed vegetative areas on the drawings and soil amendment specifications with regard to excessive drainage, low pH, and high salinity characteristics of the site soil types.
- All final plans approved for adequacy are to be implemented by the contractor. The Compliance Project Manager (CPM) should be contacted before any revisions are made to the approved plans.
- Dewatering facilities, in the event of groundwater contact during excavation activities.

- Stormwater inlet protection needs to be implemented during construction.
- The erosion control drawings and narrative need to be designed and sealed by a professional engineer/erosion control specialist and not by the contractor.

CONCLUSIONS AND RECOMMENDATIONS

Staff commends the Applicant for proposing the use of reclaimed water that will minimize the use of fresh water during construction and operation of the PEP. Staff has determined that the PEP would result in less than significant impacts regarding soil and water resources if the following conditions of certification are implemented.

CONDITIONS OF CERTIFICATION

SOIL&WATER 1: Prior to site mobilization, the project owner shall comply with all the requirements of the National Pollutant Discharge Elimination System (NPDES) general permit for stormwater discharge associated with PEP construction activities. The project owner, as required under the General Construction Activity Storm Water Permit, will develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for construction of the entire project.

Verification: No later than sixty days prior to site mobilization for any project element, the project owner shall submit a copy of the SWPPP to the Compliance Project Manager (CPM) for review and approval. The SWPPP will include copies of any local permits that specify requirements for the protection of stormwater or water quality. The General Construction SWPPP shall address all staff comments and the final design of the project. Approval of the plan by the CPM must be received prior to site mobilization.

SOIL&WATER 2: Prior to the start of site mobilization for any project element, the project owner shall obtain CPM approval for a site specific Erosion and Sediment Control Plan that addresses all project elements throughout construction and operation of the PEP project.

Verification: No later than sixty days prior to the start of site mobilization for any project element, the Erosion and Sediment Control Plan shall be submitted to the CPM. The plan shall comply with City of Escondido and San Diego County requirements. The plan must be approved by the CPM prior to site mobilization for any project element.

SOIL&WATER 3: The project owner shall comply with all requirements of the NPDES general permit for stormwater discharge associated with industrial activities of the PEP. The project owner, as required under the General Industrial Activity Storm Water Permit, will develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of the power plant. The project owner must obtain approval of the General Industrial Activities SWPPP from the CPM prior to commercial operation of the PEP.

Verification: No later than sixty days prior to the start of commercial operation, the project owner shall submit to the CPM a copy of the SWPPP prepared under

requirements of the General Industrial Activity Storm Water Permit. The operational SWPPP shall be approved by the CPM prior to the start of commercial operation.

SOILS&WATER 4: Prior to site mobilization for any project element, the project owner shall submit a Stormwater Management plan consistent with the City of Escondido's Drainage Design Standards.

Verification: No later than sixty days prior to site mobilization for any project element, the Stormwater Management plan shall be submitted to the CPM for review and approval and to the City of Escondido's Public Works Department for review and comment.

SOILS&WATER 5: As proposed, the PEP does not have a backup cooling water source. In the event an outage at the HARRF is longer than the emergency supply capacity of the on-site water tank, the PEP will shut down or operate only those generation facilities that do not require cooling water -- the combustion turbine generators. Potable water will not be used for the wet cooling system or for any purpose other than those proposed in the AFC and shall not exceed 2.0 acre-feet in any calendar year.

Verification: The project owner shall submit a water use summary report to the CPM in the annual compliance report for the life of the project. The annual summary report shall be based on recorded use of reclaimed water from the City of Escondido's HARRF and potable water from the Rincon del Diablo Municipal Water District. The report will include daily hydrographs of water use, including calculated monthly range, monthly average, daily range, daily average and annual use by the project in both gallons per minute and acre-feet. For subsequent years, this information shall also include the annual range and annual average water used by the project.

REFERENCES

Appendix A, Escondido Research and Technology Center Specific Plan dated June 27, 2001.

Palomar Energy, LLC, San Diego, California (Palomar) 2001a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 28, 2001.

Palomar Energy, LLC, San Diego, California (Palomar) 2002b. Responses to CEC Staff's Data Requests 1-117. Submitted to the California Energy Commission on April 8, 2002.

Palomar Energy, LLC, San Diego, California (Palomar) 2002c. Applicant's Supplemental Responses to CEC Staff Data Requests. Submitted to the California Energy Commission on May 8, 2002.

San Diego County Water Authority, 2002. http://sdcwa.org. Page viewed by Joe Crea, July 26, 2002.

The Weather Channel, 2001. http://weather.com. Page viewed by Joe Crea, July 26, 2002.

San Diego Regional Water Quality Control Board, 2002. September 1994 Update to the Water Quality Control Plan for the San Diego Basin.

TRAFFIC AND TRANSPORTATION

Steven J. Brown, P.E.

INTRODUCTION

The Traffic and Transportation section of the Preliminary Staff Assessment (PSA) addresses the extent to which the project may impact the transportation system within the vicinity of the proposed Palomar Energy Project (PEP). The influx of large numbers of construction workers can, over the course of the construction phase, increase roadway congestion and also affect traffic flow. In addition, the transportation of large pieces of equipment can impact roadway congestion and safety. The construction of linear facilities (such as water service) can temporarily disrupt traffic flows when trenching across roadways. Potential impacts related to traffic operations and safety hazards resulting from the construction and operation of the project are discussed below.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Federal, state, and local laws, ordinances, regulations, and standards (LORS) that are applicable to the proposed project are listed below. Included are regulations related to the transportation of hazardous materials, which are designed to control and mitigate for potential impacts. The Applicant has indicated its intent to comply with all federal, state, and local regulations related to the transport of hazardous materials.

FEDERAL

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

- Title 49, Code of Federal Regulations, sections 171 through 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 through 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. The California Health and Safety Code addresses the transportation of hazardous materials. Specific provisions include:

- California Vehicle Code, section 353 defines hazardous materials.
- California Vehicle Code, sections 31303 through 31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- California Vehicle Code, sections 31600 through 31620, regulates the transportation of explosive materials.

- California Vehicle Code, sections 32000 through 32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.
- California Vehicle Code, sections 32100 through 32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.
- California Vehicle Code, sections 34000 through 34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-. 7, 34506, 34507.5 and 34510-11, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- California Health and Safety Code, sections 25160 et seq., addresses the safe transport of hazardous materials.
- California Vehicle Code, sections 2500 through 2505 authorizes the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.
- California Vehicle Code, sections 13369, 15275, and 15278 address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.
- California Streets and Highways Code, sections 117 and 660 through 72, and California Vehicle Code sections 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Vehicle Code, Section 35550 through 35559 imposes gross weight limits upon the highway by requiring that the wheels on any one axle of a vehicle shall not exceed 18,000 pounds, and the gross weight upon any one wheel, or wheels, supporting one end of an axle and resting upon the roadway, shall not exceed 9,500 pounds, except that the gross weight imposed upon the highway, by the wheels on any front steering axle of a motor vehicle, shall not exceed 12,500 pounds. The maximum allowable gross combination weight is 80,000 pounds.
- 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.

In addition all construction within the public right-of-way must comply with the “Manual of Traffic Controls for Construction and Maintenance of Work Zones” (Caltrans, 1996).

REGIONAL

Since the project site is located within San Diego County, San Diego County Association of Governments (SANDAG) standards and regulations are relevant. SANDAG has prepared a Year 2020 Regional Transportation Plan (RTP) that implements related federal regulations and establishes regional transportation goals, policies, objectives, and actions for various modes of transportation. The current RTP,

adopted in 2000, is a long-range (20-year) plan that assesses the transportation impacts of proposed projects, establishes air quality conformity as required by federal regulations, and discusses intermodal and multimodal transportation activities.

SANDAG is required by federal law to develop and publish a Regional Transportation Improvement Program (RTIP) at least every two years. The RTIP is a short-range (four-year) program that incrementally implements the RTP. The RTIP is comprised of project lists from the State Transportation Improvement Program (STIP) for urbanized and non-urbanized areas, as well as other programs using state and/or federal funding. The current RTIP was adopted by SANDAG in July, 2000.

SANDAG is the designated Congestion Management Agency (CMA) for San Diego County under the 1990 Congestion Management Program (CMP). As the CMA, SANDAG must develop, adopt, and update the CMP for the region. SANDAG's most current update of the CMP, completed in 1999, has been incorporated into the RTP. Implementation guidelines for the CMP have been developed jointly by the San Diego Traffic Engineer's Council (SANTEC) and the Institute of Transportation Engineers (ITE). The objective of the County's CMP is to ensure that enhanced capacity analysis is conducted on freeways and designated Regionally Significant Arterials (RSAs) in San Diego County, and that deficiency plans are developed to ensure that these facilities attain the minimum performance standard of Level of Service (LOS) D.

The Guidelines for Traffic Impact Studies in the San Diego Region (SANTEC/ITE, Final Draft, March 2, 2000) set LOS D as the minimum acceptable level of service for planning purposes. LOS E and F are considered unacceptable.

LOCAL

The City of Escondido Circulation Plan and policies provide for the transportation needs of the community and subregion by implementing a circulation system, which provides a high level of mobility, efficiency, access, and safety for all modes and purposes of trips. These modes may include, but not be limited to, automobiles, trucks, buses, bicycles, pedestrian, and rail. The intent of this Circulation Plan is to insure that the siting and development of new facilities is coordinated with future population growth and provides a balanced mix of transportation resources to the community.

The City of Escondido Circulation Plan further specifies that the City shall provide adequate traffic safety measures on all new roadways and shall strive to provide adequate traffic safety measures on existing roadways subject to fiscal and environmental considerations. These measures may include, but not be limited to, appropriate levels of maintenance, proper street design, traffic control devices (signs, signals, striping), street lighting, and coordination with the school districts and other agencies.

The City's Circulation Plan calls for the reduction of the total number of vehicle trips through development and implementation of a Transportation Demand Management (TDM) program. This may include, but shall not be limited to, site-specific peak-hour traffic-management plans, requirements for ride sharing, encouragement of ride sharing

in the public and private sector, provision for park-and-ride facilities adjacent to the regional transportation system, and support for transit subsidies.

The City of Escondido has adopted significance criteria for both signalized and unsignalized intersections. An impact is considered significant when the intersection level of service falls below mid-level LOS D (delay of 45.1 seconds or more for signalized intersections and 30.1 seconds or more for unsignalized intersections). If the intersection already operates at mid-LOS D or worse, a significant cumulative impact occurs if delay increases by more than two seconds for both signalized and unsignalized conditions. The objective of the Congestion Management Program is to ensure that enhanced capacity analysis is conducted on freeways and designated Regionally Significant Arterials (RSAs) in San Diego County, and that deficiency plans are developed to ensure that these facilities attain the minimum performance standard of LOS D.

The City of Escondido does not have weight and load limits that apply to the city roadways in the study area. The local roadways affected by the Palomar Energy Project are subject to a load limitation of 80,000 pounds per truck, per California Vehicle Code Section 35550, which is summarized in the State LORS section.

SETTING

REGIONAL DESCRIPTION

The Palomar Energy Project is planned for a vacant 20-acre site within a planned 186-acre Escondido Research and Technology Center (ERTC) industrial park in the City of Escondido, California. The project site is located west of Interstate 15 (I-15) and south of Highway 78, about 600 feet southwest of the intersection of Vineyard Avenue and Enterprise Street.

TRAFFIC AND TRANSPORTATION FIGURE 1 shows the site and surrounding area. Access to the site is provided from State Highway 78 by traveling south on Nordahl Road, which becomes Vineyard Avenue. Descriptions of relevant roads and highways in the study area are provided below.

Freeways and Local Roadways

U.S. Interstate 15, located east of the project site carries approximately 185,000 vehicles per day between Valley Parkway and Highway 78.

State Highway 78, located north of the project site, is an east-west freeway that carries approximately 148,000 vehicles per day between Nordahl Road and the junction with I-15.

Nordahl Road is classified as a four-lane, primarily north-south Major Road north of Highway 78 and it is classified as a six-lane Major Road south of Highway 78. Nordahl Road is currently a four-lane road from East Mission to Country Club Drive. The City plans to widen this segment to six-lanes. Nordahl Road currently carries approximately

35,000 vehicles per day. Curb, gutter, sidewalks, bicycle lanes and a raised median exist throughout this roadway. On street parking is prohibited.

Citracado Parkway is classified as a four-lane Collector from East Mission Road to Country Club Drive. Citracado Parkway is a four-lane road from East Mission Road to Country Club Drive. South of East Mission Road Citracado Parkway carries approximately 16,500 vehicles per day. Curb, gutter and sidewalks are provided, and the posted speed limit is 40 mph.

For the PEP construction traffic Citracado Parkway must be extended south from Vineyard Avenue. Citracado Parkway has not been constructed south of Vineyard Avenue but current plans call for Citracado Parkway to be constructed as a rough graded road during PEP construction. During the development of the Escondido Research and Technology Center, Citracado Parkway will be constructed to a modified collector roadway standard from Vineyard Avenue to Anderson Drive.

Vineyard Avenue is classified as a four lane Collector but is currently striped as a two-lane road with a center two-way left-turn lane and parallel parking along both curbs. Vineyard Avenue carries approximately 16,700 vehicles per day in the vicinity of Citracado Parkway.

Mission Road is classified as a six-lane Major Road from Nordahl Road/Citracado Parkway to Andreason Drive and a four-lane Major Road east of Andreason Drive. This facility is a four-lane road with a two-way left-turn lane within the study area. Curb, gutter, sidewalk and bicycle lanes are provided, while parking is prohibited. The posted speed limit is 45 mph.

Country Club Drive is classified as a two lane Local Collector Street and is a two-lane road with limited curb, gutter and sidewalk improvements. Country Club Drive carries approximately 1,500 vehicles per day and has a posted speed limit of 45 mph.

TRAFFIC AND TRANSPORTATION Figure 1
Regional Setting

Harmony Grove Road is a two-lane local collector with dirt shoulders. Traffic volume data was not available, but staff field observation indicated low volume and no congestion.

Lincoln Avenue is a two-lane road with on street parking. Traffic volume data was not available, but staff field observation indicated low volume and no congestion.

Metcalf Street is a designated as a collector with 4-lanes. It is presently striped as a two-lane road. Traffic volume data was not available, but staff field observation indicated low volume and no congestion.

PUBLIC TRANSPORTATION

There are a number of bus routes in the project vicinity, with the nearest route running along Vineyard Avenue less than a quarter of a mile north and east of the site. A commuter rail project is discussed below in the Planned Roadway and Transit Improvements Section.

BICYCLE FACILITES

There are limited bicycle routes and bicycle lanes in the Palomar project area. None of the streets directly affected by the project have Class I (bicycle paths) or Class II (bicycle lanes) bicycle facilities.

PLANNED ROADWAY AND TRANSIT IMPROVEMENTS

Long-range improvements planned for the regional transportation system in and around the City of Escondido include improvements to I-15 and an Oceanside to Escondido Commuter Rail Line.

The I-15 project would construct four high-occupancy vehicle/managed lanes on I-15 between State Route 56 in Rancho Penasquitos and Highway 78 in Escondido. The Managed Lane concept involves reversible high-occupancy vehicle lanes oriented in the peak direction of travel. Anticipated completion of construction, according to the RTIP, is during the 2003 fiscal year. Construction is not yet underway, and no adverse impacts are anticipated related to construction schedules of the HOV lanes and the power plant.

The Oceanside to Escondido Commuter Rail Line would provide east/west light rail service between the western portion of Escondido and the City of Oceanside, west of Interstate 5. The proposed service would initiate at the existing Escondido Transit Center and precede westerly on the San Diego Northern right-of-way along the south side of West Washington Avenue/Mission Road. A future transit station is proposed adjacent to the Mission Road/Citracado Parkway intersection approximately three quarters of a mile from the project site. According to the RTIP, construction of this project is scheduled for completion in FY 2008. Much of the line would use existing railroad rights of way, and no adverse impacts are anticipated related to construction schedules of the rail service and the power plant.

Citracado Parkway does not currently exist between Vineyard Road and Avenida Del Diablo and Scenic Trail to Gamble Lane. In conjunction with the development of the Escondido Research and Technology Center (ERTC), Citracado Parkway will be

extended between Vineyard Avenue and Harmony Grove Road. This would provide for direct access to the Palomar Energy site and traffic flow through the ERTC. The ERTC Specific Plan is undergoing separate CEQA review by the City of Escondido. The draft Environmental Impact Report (EIR) was issued on July 16, 2002. Energy Commission staff are currently reviewing the draft EIR, and plan to submit comments on it in early September.

The applicant and the City of Escondido have not established a specific time frame for the construction of this portion of Citracado Parkway. Construction will be tied to the development schedule of the PEP and the ERTC industrial park. PEP construction related traffic would access the site from Vineyard Avenue/Citracado Parkway via a rough graded road to be built for the construction traffic associated with the PEP. This rough graded road will follow the alignment of the future Citracado Parkway that will be part of the industrial park development.

TRUCK TRAFFIC

Vehicle classification counts conducted in May 2001 indicate that trucks comprise approximately 35 percent of the total traffic volume on Citracado Parkway south of Mission Road and on Vineyard Avenue, east of Citracado Parkway. Trucks comprise approximately four percent of the daily traffic volume on Interstate 15 and Highway 78.

Current intersection and roadway operating conditons

Intersections are usually the critical elements of the roadway system when assessing adequate travel capacity, maximizing safety, and minimizing environmental impacts. The operating conditions of a roadway system, including intersections, are described using the term “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. LOS can range from “A,” representing free-flow conditions with little or no delay, to “F,” representing saturated conditions with substantial delay.

The City of Escondido has adopted significance criteria for both signalized and unsignalized intersections. An impact is considered significant when the intersection LOS falls below mid-level LOS D (i.e., delay of 45.1 seconds or more for signalized intersections and 30.1 seconds or more for unsignalized intersections). If the intersection already operates at mid-LOS D or worse, a significant cumulative impact occurs if delay increases by more than two seconds for either signalized and unsignalized conditions. The objective of the County’s Congestion Management Program is to ensure that enhanced capacity analysis is conducted on freeways and designated Regionally Significant Arterials (RSAs) in San Diego County, and that deficiency plans are developed to ensure that these facilities attain the minimum performance standard of LOS D.

Staff’s review and analysis of the existing conditions at the intersections that will be most affected by the expected construction traffic and the current service levels (A.M./P.M.) are shown in **TRAFFIC AND TRANSPORTATION Table 1**.

TRAFFIC AND TRANSPORTATION Table 1
Intersection Level of Service - Existing Conditions

Intersection	*Analysis Type*	*A.M. LOS*[1]	*P.M. LOS*[1]
Nordahl Rd./Highway 78 WB ramps	Traffic Signal	B	C
Nordahl Rd./Highway 78 EB ramps	Traffic Signal	A	C
Nordahl Rd/Citracado Pkwy./Mission Rd.	Traffic Signal	C	C
Country Club Drive/Citracado Pkwy.	Two-Way Stop	Country Club Dr. = F Citracado = A	Country Club Dr. = F Citracado = A
Vineyard Ave./Citracado Pkwy. (Future Intersection)	Two-Way Stop		

[1] Level of service for intersections was determined using the 1997 Highway Capacity Manual (HCM) Chapter 9 (Signalized Intersections) methodology. HCM two-way stop control methodologies provide LOS calculations by movement, not for the entire intersection.

At the intersections expected to be most affected by project workforce traffic, peak hour LOS is C or better, with exception of the Country Club/Citracado Pkwy. intersection. The Country Club Drive approach to this intersection currently operates at LOS F (i.e., more than 100 seconds of delay) during both the A.M. and P.M. peak periods. The discussion below (in the IMPACTS section) analyzes the potential traffic and transportation impacts, and proposed mitigation measures, at this location.

IMPACTS

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

- cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;
- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- result in inadequate emergency access;
- result in inadequate parking capacity; or
- conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Construction Phase

Commute Traffic

Trips generated as a result of the project will consist of both construction worker travel and truck delivery activity. The applicant has estimated that construction of the power plant facility will occur over a 21-month period and will require an average construction workforce of 240 workers per month, assuming a single shift and a 40-hour workweek. During the peak construction period (the eleventh month after initiation), an estimated 350 construction workers will be required.

Grading activity for site preparation for the overall ERTC and creation of Planning Area (PA) 1 of the ERTC will occur before PEP construction. This grading would occur with or without the PEP, and may occur before the Commission's review process is completed. Potential traffic impacts of the grading are being evaluated in the City's CEQA review of the ERTC and in our cumulative analysis.

Some workers may commute via public transit and/or carpooling. A travel behavior survey for the San Diego region (SANDAG, 1987) concluded that the peak home-to-work vehicle occupancy was 1.05. As a worst-case scenario, the applicant assumed that each of the workers would drive a separate vehicle to the Palomar site (Palomar 2001a, section 5.11.2. page 5.11-11), making two trips per day (one round trip from home to the site and back). This assumption of a separate vehicle for each worker is conservative given the likelihood of at least a small amount of ride sharing. The possibility of ridesharing and mobile food services coming to the PEP site offsets the possibility of some lunch-related trips by the workers. Therefore, project construction could result in a total of approximately 480 vehicle trips during the A.M. and P.M. peak hours (combined) from 240 workers on average, and approximately 700 vehicles during the A.M. and P.M. peak hours (combined) for the 350 workers traveling during the peak construction period. Approximately 12 truck deliveries per day will be made to the site on average, with a peak of 30 deliveries per day during the eleventh month.

The preferred commuting route will depend upon the residential location of construction workers. However, the primary access route will be from Interstate 5 or Interstate 15 to Highway 78; exiting Highway 78 at the Nordahl Road exit; traveling south on Citracado Parkway; east on Vineyard Avenue; and south on a rough graded road along the alignment of the future Citracado Parkway.

Staff has proposed mitigation measures and conditions of certification (see Condition of Certification **TRANS-6**) to address intersection control and turning movement issues related to the Vineyard Road/Citracado Parkway rough graded road intersection. At this location, the project owner shall install 150 feet of left-turn storage, plus adequate taper length, for westbound traffic on Vineyard Avenue, and 150 feet of right-turn deceleration, plus adequate taper length, on Citracado Parkway at the intersection of the rough graded access road provided along the alignment of the future Citracado Parkway extension and Vineyard Avenue. In addition, the project owner shall install stop control at Vineyard Avenue for northbound movements on the rough graded access road. These measures will effectively address all intersection control and turning movement issues and result in safe turning movements to and from the project

site. All workers using the Nordahl Road exit from Highway 78 (approximately 75 percent of peak period and overall construction worker trips) will travel through the Country Club/Citracado Parkway intersection, which is characterized by very congested conditions on the Country Club approach. Impacts and mitigations at this location are addressed below.

To determine the potential for impact, staff added construction employee commute trips to existing traffic volumes on study area roadways and intersections. **TRAFFIC AND TRANSPORTATION Table 2** summarizes staff's analysis of expected intersection operations with the addition of the project.

TRAFFIC AND TRANSPORTATION Table 2
Intersection Level of Service - Existing Plus Project (Construction Peak)

Intersection	*Analysis Type*	*A.M. LOS*[1]	*P.M. LOS*[1]
Nordahl Rd./Highway 78 WB ramps	Traffic Signal	B	C
Nordahl Rd./Highway 78 EB ramps	Traffic Signal	A	C
Nordahl Rd/Citracado Pkwy./Mission Rd.	Traffic Signal	C	C
Country Club Drive/Citracado Pkwy.	Two-Way Stop	Country Club Dr. = F[2] Citracado = A	Country Club Dr. = F[2] Citracado = A
Vineyard Ave./Citracado Pkwy. (Future Intersection)	Two-Way Stop	Vineyard = A Citracado = A	Vineyard = A Citracado= F[3]

[1] Level of service for intersections was determined using the 1997 Highway Capacity Manual (HCM) Chapter 9 (Signalized Intersections) methodology. HCM two-way stop control methodologies provide LOS calculations by movement, not for the entire intersection.
[2] LOS F at this intersection can be mitigated through construction of a traffic signal
[3] LOS F for Citracado construction traffic will be temporary, occurring during peak construction activity prior to completion of intersection improvements and construction of a traffic signal.

With the exception of the Country Club Drive/Citracado Parkway intersection during both peak hours and the Vineyard Avenue/Citracado Parkway intersection during the P.M. peak hour, peak hour LOS will be C or better at the intersections most affected by project workforce traffic. Before starting development of the ERTC industrial park and prior to the start of construction for the PEP facility, Citracado Parkway will be rough-graded from Vineyard Avenue south to allow for construction traffic to access the industrial park and the PEP site. During the initial ERTC development and PEP construction, traffic on the rough-graded Citracado Parkway will be staff and workers associated with the construction of the ERTC industrial park and the PEP facility. During the P.M. peak hour, those workers exiting the site from the rough-graded Citracado Parkway access road and making a left turn onto Vineyard Avenue would experience a LOS of F. Construction of a traffic signal is not recommended immediately, since Citracado Parkway will be a rough-graded access road until construction activities are complete. The City is analyzing the overall impacts of the ERTC in its CEQA review, including traffic impacts on the intersections in the vicinity, such as the Citracado Parkway/Vineyard Avenue intersection. Staff is reviewing the draft EIR that the City released on July 16, 2002, and will provide comments in early September.

The ERTC proposed mitigation measures at this intersection include; a traffic signal, for northbound traffic dual left-turn lanes and one right turn lane, for westbound traffic one left turn lane and two through lanes, and for eastbound traffic two through lanes and one right turn lane. According to the DEIR these mitigation measures result in the intersection having a mid LOS of D or better.

To minimize the impact of construction traffic leaving the project site without a signal the applicant needs specific traffic controls measures for the Vineyard Avenue/Citracado Parkway intersection. This would include scheduling the workforce traffic so that it avoids the intersection during P.M. ambient peak hour traffic, having a flagperson present to direct traffic, and avoiding departure of construction truck traffic during the P.M. peak traffic hours between 4:00 and 6:00 p.m. These circumstances are addressed in the proposed condition of certification **TRANS-5**.

The Country Club Drive approach to the Country Club Drive/Citracado Parkway currently operates at LOS F, and is expected to continue operating at LOS F during both the A.M. and P.M. peak periods. Additional construction traffic (260 A.M. trips and 260 P.M. trips) related to the PEP would increase the delay at this intersection by more than two seconds. Based on City of Escondido significance criteria, this delay represents a significant impact. Construction workers will utilize the Country Club Drive/Citracado Parkway intersection, and other intersections east of the site for commute trips. Approximately 75 percent of the 350 peak period construction work trips, or 260 A.M. and 260 P.M. trips, will cross the Country Club Drive/Citracado Parkway intersection with the remainder expected to exit on Vineyard Avenue traveling east. Although Vineyard Avenue is presently operating at a LOS F the volume of traffic associated with the construction traffic for PEP does not result in increasing traffic delays by more than two seconds.

To minimize the effect of traffic on the Country Club Drive/Citracado Parkway intersection the applicant needs to consult with the City of Escondido. Staff has proposed mitigation measures and conditions of certification to address this potential impact. In order to reduce the PEP construction traffic impact to a less than significant level, construction of a traffic signal at the Country Club Drive/Citracado Parkway intersection will be necessary. Staff recommends that the applicant pay on a fair share basis for construction of a traffic signal that would effectively eliminate the LOS F condition at the intersection (see Condition of Certification **TRANS-8**). Furthermore, Condition of Certification **TRANS-5** requires construction workers to arrive/depart at times outside of the peak traffic periods to further reduce construction traffic effects on local traffic flow.

Linear Facilities

Reclaimed Water Supply and Brine Return Pipelines

Reclaimed water for the project will be supplied from the City of Escondido's Hale Avenue Resource Recovery Facility (HARRF). The project will return a brine solution to the HARRF. Pipelines for reclaimed water supply and brine return will be routed along side of each other, with an approximate length of 1.1 miles. Approximately 2,500 feet of the pipelines will be located in Harmony Grove Road within Escondido. Harmony Grove

Road is classified as a rural collector with very low traffic volume. The remainder of the pipelines' route will either be within the planned industrial park along the proposed extension of Citracado Parkway or the SDG&E transmission corridor, and will not affect the area's public roadways.

That portion of the pipeline route outside of the industrial park will leave the southern portion of the industrial park traveling east along Harmony Grove Road approximately 1,300 feet. It will continue to follow Harmony Grove Road as it turns northeast until it intersects with Enterprise Street, approximately 400 feet. At this intersection the pipeline route will turn southeast to the HARRF. The water/wastewater pipeline construction is expected to take less than six months.

Natural Gas System Pipeline Upgrade

The San Diego Gas and Electric Company's (SDG&E) natural gas pipeline that will serve the facility is located adjacent to the northeast corner of the project site at the end of Enterprise Street. Therefore, the natural gas fuel pipeline from this location to the PEP will not disrupt traffic flow, as no roadways will be involved in its construction.

However, SDG&E must upgrade its natural gas pipeline to relieve a bottleneck. This bottleneck is located approximately one mile northeast of the PEP site and will require the installation of approximately 2600 feet of 16-inch pipeline. This upgraded pipeline route will require construction in Lincoln Avenue from the intersection of Rock spring to Metcalf Street and then along Metcalf Street to its intersection with Mission Avenue. The natural gas pipeline upgrade will take up to three months.

Both Lincoln and Metcalf have daily volumes of approximately 2,000 vehicles (SANDAG, 2001) and are characterized by good traffic conditions (LOS C or better). In both cases, pipeline construction activities will temporarily disrupt traffic flows along the affected roadways.

Pipeline Construction

Laydown activities and construction parking will take place outside public rights-of-way. Repair and remediation for any damage to public roadways will be required through the encroachment permit process, see proposed Condition of Certification **TRANS-2**. During pipeline construction, the project owner shall be responsible for maintaining safe travel conditions for the motoring public in construction areas, which will require:

- use of flagmen to direct traffic;
- adequate plating to safely cover work areas;
- sufficient signing, striping, and marking of construction areas;
- adequate advance warning of all construction zones; and
- preparation of traffic control plans for review and approval by the City of Escondido Public Works Department and Caltrans.

Conditions of Certification **TRANS-1, TRANS-2, TRANS-4, TRANS-5, and TRANS-7** address mitigation measures for potential pipeline construction impacts in more detail.

Parking and Laydown areas

Temporary construction worker and visitor parking and construction laydown areas, will be located south of the power plant site in Planning Area 2 of the ERTC (Palomar 2001 section 2.8 page 2.53). Staff has proposed Condition of Certification **TRANS-4** that would require that the project owner direct all construction worker parking to designated, on-site, parking areas that do not affect public roads. The ERTC site is large enough to accommodate all construction-related parking.

Truck Traffic

Whenever possible, truck deliveries will be scheduled for the hours on weekdays outside the 7-9 A.M. and 4-6 P.M. peak traffic periods. At the peak month of construction, 30 deliveries per day are expected to access the project site. This averages to approximately four trips per hour. Conditions of certification **TRANS-1, TRANS-2, TRANS-3, TRANS-4, TRANS-5, TRANS-6,** and **TRANS-7** include measures to address potential truck traffic impacts during the construction period.

Transport of Hazardous Materials and Waste

In addition to delivery of heavy equipment, construction materials (such as concrete, wire, pipe, cable, fuels) and consumables, other deliveries will include hazardous materials to be used during project construction. The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. Potential impacts can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. Staff has proposed condition of certification **TRANS-3** to ensure that these requirements are met.

The handling and disposal of hazardous substances are addressed in the **Waste Management** and **Hazardous Materials Management** sections of this report. Conditions of certification (including Condition of Certification **TRANS-3**) ensure this compliance is discussed under their respective subsections in this staff assessment.

Oversize and Overweight Loads

Transportation of equipment that will exceed the load size and limits of certain roadways will require special permits from the City of Escondido and Caltrans. Staff has proposed Condition of Certification **TRANS-1 to** ensure compliance with this requirement.

Emergency Access

Emergency access to the site is possible from both the north and south ends of the ERTC via the Citracado Parkway extension, which will exist as a rough-graded road during the entire construction period. The nearest emergency response facility is Escondido Fire Station #1, located at 310 N. Quince. This station can be reached from the site via either Mission Road or West Valley Parkway. Nordahl Road and Highway 78 are the most proximate designated emergency evacuation routes. Emergency medical services will be provided by Palomar Hospital in Escondido approximately 2.5 miles east of the project site. The most direct route to the hospital from the project site is via Vineyard Avenue and West Valley Parkway. Ambulance service can be provided by one of four private companies in the area or the Escondido Fire Department. It is

estimated that the average response time for an ambulance would be 10 minutes with an additional 10 minutes for transportation to the hospital. Proposed Condition of Certification **TRANS-5** would require preparation of a Construction Traffic control Plan that addresses n emergency access.

Operational Phase

Commute Traffic

Operation of the power plant is expected to require a labor work force of approximately 20 full-time employees. It is anticipated that a total of 40 vehicle trips per day will be generated by the power plant, based on the assumption that each employee will drive a separate vehicle to work and that they will make one round trip from home to work each day.

Based on the relatively insignificant number of full-time employees at the Palomar Energy Project, it is anticipated that the traffic generated will be easily accommodated by the existing roadway system. The proposed power plant will not generate substantial vehicular movement; will not alter present traffic circulation patterns; will not alter waterborne, rail, or air traffic; will not substantially increase traffic hazards to motor vehicles, bicyclists, or pedestrians; will not violate adopted LOS standards; and will not create demand for new parking that cannot be accommodated by the project design. As such, operation of the proposed power plant is not expected to result in significant long-term impacts to the local transportation system.

Truck Traffic

Deliveries to the project site are expected for on-going maintenance of the plant. During project operation, about five truck deliveries per month of aqueous ammonia will be made to the plant site. Other materials are expected to be delivered to the plant site on an infrequent basis. The incremental change in the number of delivery trips to the plant site is expected to be nominal and will generally occur during non-commute periods. Therefore, the resulting LOS on local roadways would remain unchanged from the existing LOS.

Transport of Hazardous Materials and Waste

Power plant operations will necessitate the delivery of aqueous ammonia, a hazardous substance. Additional hazardous wastes generated at the site during plant operations will be transported for disposal at a Class I landfill or transported offsite for treatment or recycling. The anticipated travel route for materials delivery will be from Nordahl Road/Citracado Parkway via Highway 78, which has been designed to accommodate large vehicles. The Nordahl Road/Citracado Parkway route from Highway 78 would require traversing an at-grade railroad crossing which is controlled by a traffic signal. No sensitive land uses (such as schools and childcare centers) are located along the route.

The California Department of Motor Vehicles specifically licenses all drivers who carry hazardous materials. Drivers are required to check for weight limits and conduct periodic brake inspections. Commercial truck operators handling hazardous materials are also required to take instruction in first aid and procedures on handling hazardous waste spills. Drivers transporting hazardous waste are required to carry a manifest,

which is available for review by the California Highway Patrol at inspection stations along major highways and interstates.

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) are equally important in ensuring that the transportation and handling of hazardous materials are done in a manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol.

The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. The handling and disposal of hazardous substances is also addressed in the **WASTE MANAGEMENT, WORKER SAFETY and FIRE PROTECTION,** and **HAZARDOUS MATERIALS** sections 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. Proposed Condition of Certification **TRANS-3** would ensure compliance with these requirements for transportation of hazardous materials. Additional requirements are discussed in the sections mentioned above.

Changes to Air Traffic Patterns

The stack height for the heat recovery steam generators of 110 feet will not interfere with air traffic. There are no airports in the vicinity of the project site.

CUMULATIVE IMPACTS

The AFC for this project does not analyze cumulative conditions, but instead references the cumulative analysis completed as a part of the ERTC Traffic Impact Analysis. This study was prepared for the City of Escondido in May of 2002 as a part of the City's CEQA review of the ERTC Specific Plan. The ERTC Traffic Impact Analysis includes 15 potential projects as a part of the cumulative analysis. The analysis considered a "worst case" trip generation scenario which assumed that the entire ERTC industrial park, including the PEP site, would be developed as an office park.

The City's analysis did not include a quantitative traffic study for an ERTC scenario that included the PEP. The City's worst case scenario qualitatively assumes that there would be significantly more daily commuter traffic associated with an ERTC composed entirely of office park uses, rather than the ERTC with power plant scenario, which would add only 20 PEP-related commuters. As a result, the cumulative traffic impacts associated with the Palomar Energy Project were not included in either the AFC or in the ERTC Traffic Impact Analysis. Staff will be working with the City to determine whether the PEP's operational phase commuters will contribute to a cumulative traffic impact.

To determine the PEP's overall cumulative impact, trips associated with the 15 potential projects were added to trips associated with the ERTC developed as an office park, and both were added to existing traffic volumes on study area roadways and intersections. **TRAFFIC AND TRANSPORTATION Table 3** summarizes cumulative intersection operations.

TRAFFIC AND TRANSPORTATION Table 3
Intersection Level of Service – Cumulative Conditions with Mitigation[1]

Intersection	*Analysis Type*	*A.M. LOS[2]*	*P.M. LOS[2]*
Nordahl Rd./Highway 78 WB ramps	Traffic Signal	C	D
Nordahl Rd./Highway 78 EB ramps	Traffic Signal	D	D
Nordahl Rd/Citracado Pkwy./Mission Rd.	Traffic Signal	F[3]	F[3]
Country Club Drive/Citracado Pkwy.	Traffic Signal[4]	C	B
Vineyard Ave./Citracado Pkwy.	Traffic Signal[4]	D	C

[1] Intersection levels of service for the cumulative condition are taken from the Escondido Research and Technology Center Traffic Impact Analysis, Linscott, Law & Greenspan, 2002.
[2] Level of service for intersections was determined using the 2000 Highway Capacity Manual Chapter 9 (Signalized Intersections) methodology.
[3] The Escondido Research and Technology Center Traffic Impact Analysis does not identify further mitigation.
[4] Mitigation includes the installation of a new traffic signal and appropriate modifications to the current intersection geometry.

As shown in **TRAFFIC AND TRANSPORTATION Table 2**, during the PEP construction period, the Nordahl Rd./Citracado Pkwy./Mission Rd. intersection is expected to operate at LOS C during the daily peak traffic intervals. The Nordahl Rd./Highway 78 eastbound ramp is expected to operate at LOS A during the A.M. peak period, and at LOS C during the P.M. peak period. It is only under the cumulative scenario shown in **TRAFFIC AND TRANSPORTATION Table 3**, which includes the buildout of the ERTC and a number of other nearby development projects, that the Nordahl/Citracado/Mission intersection is expected to deteriorate to LOS F. Similarly, it is only under the cumulative scenario, that LOS for the Nordahl/Highway 78 eastbound ramp is expected to deteriorate to D during both A.M. and P.M. daily peak periods. Under cumulative conditions, when the PEP is in operation with 20 full-time employees, the PEP will represent a very small percentage of the increased traffic flow at the Nordahl Rd./Citracado Pkwy./Mission Rd. intersection, and the Nordahl/Highway 78 eastbound ramp.

The ERTC Traffic Impact Analysis identifies proposed mitigation measures necessary to achieve the cumulative levels of service shown in **TRAFFIC AND TRANSPORTATION Table 3**. Due to right of way constraints and lack of additional feasible mitigation measures, the ERTC Traffic Impact Analysis does not identify additional mitigation for cumulative traffic volumes at the Nordahl Rd./Citracado Pkwy./Mission Rd. intersection. Impacts of the ERTC and other cumulative development will result in traffic and transportation impacts at this intersection that are significant and unavoidable. Staff is tentatively recommending that the Palomar Energy Project contribute a fair share of the cost of implementing of the cumulative mitigation measures, as required in Condition of Certification **TRANS-9**. The PEP's share would be based on the traffic resulting from on going plant operations. When the City concludes its EIR process on the ERTC, staff will consider the appropriateness and timing of this condition.

FACILITY CLOSURE

There are at least three circumstances in which a facility closure can take place; planned closure, unexpected temporary closure and unexpected permanent closure.

PLANNED CLOSURE

The minimum design life of the power plant is expected to be 30 years. At least 12 months prior to the proposed decommissioning, the applicant shall prepare a closure plan for submission to the Energy Commission for review and action. At the time of closure all then-applicable laws, ordinances, regulations, and standards (LORS) will be identified and the closure plan will address how these LORS will be complied with. The effects of closure for the Palomar Energy power plant on traffic and transportation will be similar to those discussed for the construction of the project. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. From the perspective of traffic and transportation issues, in the event of temporary facility closure, the applicant would have to comply with all applicable policies contained in the LORS section of this report regarding transportation permits for hazardous materials and equipment.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. Staff assumes that the facility will either remain idle until such time that new ownership is established, or dismantling of the facility will occur. In any event, the owner will have to secure applicable transportation permits to satisfy the LORS requirements as stated in this report.

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

MITIGATION

The applicant has indicated their intention to comply with all LORS relating to:
the transport of hazardous materials;

- the transport of oversized loads; and
- the receipt and compliance with all necessary encroachment and transportation permits for any construction activity within the public right-of-way.

Staff proposes conditions of certification **TRANS-1**, **TRANS-2**, and **TRANS-3** to ensure compliance with these requirements.

Staff has also proposed additional conditions of certification to require the applicant to implement the following traffic and transportation mitigation measures:

- enforce a policy that all project-related parking occurs in designated, off-street parking areas (**TRANS-4**);
- repair any damage to adjacent roadway sections incurred during construction to the road's pre-project construction condition. Any repair work needed shall occur outside of the ambient street traffic peak periods (**TRANS-7**); and
- prepare a construction traffic control and plan and implementation program subject to review by the City of Escondido Public Works Department (**TRANS-5**). The construction traffic control and transportation demand management program should include measures to maximize construction worker carpooling. The construction traffic control and transportation demand management program should include measures to mitigate direct and cumulative impacts associated with construction activities occurring within any public street right-of-way in accordance with local jurisdictional requirements.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is greater than 50 percent within a six-mile radius of the proposed Palomar Energy Project (please refer to **Socioeconomics Figure 1** in this Staff Assessment), and Census 1990 information that shows the low-income population is less than 50 percent within the same radius. Based on the **Traffic and Transportation** analysis, staff has identified significant direct and cumulative impacts resulting from the construction or operation of the project. We believe that these potential impacts can be mitigated to a level of insignificance and we are recommending adoption of mitigation measures. Given the recommended mitigation of the potential traffic impacts, staff has concluded that there are no **Traffic and Transportation** environmental justice issues related to this project.

CONCLUSIONS

Staff has concluded that the proposed project has the potential to cause an impact in the traffic and transportation area. All identified project impacts can be mitigated to a level of insignificance through the implementation of staff's proposed mitigation measures. If the project is approved, staff recommends that the Energy Commission adopt the following Conditions of Certification.

CONDITIONS OF CERTIFICATION

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

Verification: In the Monthly Compliance Reports (MCR), the project owner shall submit copies of any permits received during that reporting period. In addition, the

project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-2 The project owner and/or its contractor(s) shall comply with Caltrans and other relevant jurisdictions limitations for encroachment into public rights-of-way and shall obtain all necessary encroachment permits from Caltrans and all relevant jurisdictions.

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

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

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

TRANS-4 During construction of the power plant and all related facilities, the project shall develop a parking and staging Plan for all phases of project construction to enforce a policy that all project-related parking occurs on-site or in designated off-site parking areas.

Verification: At least 60 days prior to start of site mobilization, the project owner shall submit the Parking and Staging Plan to the City of Escondido Public Works Department for review and comment, and to the CPM for review and approval.

TRANS-5 The project owner shall consult with the City of Escondido Public Works Department, and prepare and submit to the CPM for approval a Construction Traffic Control Plan and Implementation Program, which addresses the following issues:

- Measures and incentives to maximize employee ridesharing;
- timing of heavy equipment and building materials deliveries;
- redirection of construction traffic with a flagperson;
- signing, lighting, and traffic control device placement if required;
- need for construction work hours and arrival/departure times outside of peak traffic periods;
- methods for insuring access for emergency vehicles to the project site;
- temporary travel lane closure; and
- access to adjacent residential and commercial property during the construction of all linear facilities related to the project.

Verification: At least 30 days prior to site mobilization, the project owner shall provide to the CPM a copy of the Construction Traffic Control Plan and Implementation Program.

TRANS-6 The project owner shall install 150 feet of left-turn storage plus adequate taper length for westbound traffic on Vineyard Avenue and 150 feet of right-turn deceleration plus adequate taper length on Citracado Parkway at the intersection of the rough graded access road provided along the alignment of the future Citracado Parkway extension and Vineyard Avenue. The project owner shall install stop control at Vineyard Avenue for northbound movements on the rough graded access road.

Verification: 60 days prior to the start of construction, submit for City of Escondido and CPM approval, a plan for development of turn storage and taper length on westbound Vineyard and Citracado Parkway. Prior to the start of construction, and after review and approval by the City of Escondido Public Works Department, the project owner shall install 150 feet of left-turn storage for westbound traffic on Vineyard Avenue and 150 feet of right-turn deceleration on Citracado Parkway at the intersection of the rough graded access road provided along the alignment of the future Citracado Parkway extension and Vineyard Avenue. The project owner shall install stop control at Vineyard Avenue for northbound movements on the rough graded access road.

TRANS-7 Prior to the beginning of on-site construction activities, the applicant shall prepare a Construction Mitigation Plan in conjunction with the City of Escondido Public Works Department, to insure that Nordahl Road, Citracado Parkway, Vineyard Avenue, Harmony Grove Road, Lincoln Avenue, and Melcalf Street will repaired and reconstructed to original, or as near original, condition as possible. This Plan shall:

- document existing pavement conditions on Nordahl Road, Citracado Parkway, Vineyard Avenue, Harmony Grove Road, Lincoln Avenue, and Melcalf Street, and identify any segments that may be inadequate to accommodate oversize or large construction vehicles, and complete remediation measures as necessary;
- provide appropriate bonding or other assurances to insure that any damage to Nordahl Road, Citracado Parkway, Vineyard Avenue, Harmony Grove Road, Lincoln Avenue, and Melcalf Street due to construction activity will be remedied by the applicant;
- relocate utility poles if necessary, to insure that adequate clear zones are established along the property frontage; and
- reconstruct portions of Nordahl Road, Citracado Parkway, Vineyard Avenue, Harmony Grove Road, Lincoln Avenue, and Melcalf Street that are affected by the installation of underground utilities.

Verification: Submit, for City of Escondido approval, a Construction Mitigation Plan for Nordahl Road, Citracado Parkway, Vineyard Avenue, Harmony Grove Road, Lincoln Avenue, and Melcalf Street. The plan shall be submitted at least 30 days prior to the start of site preparation or earth moving activities.

TRANS-8 Installation of a traffic signal at the Country Club Drive/Citracado Parkway intersection is necessary to provide operating conditions during peak construction periods that are within acceptable levels based on the City of Escondido significance criteria.

Verification: At least 90 days prior to mobilization or ground disturbance activities on the site, the applicant shall submit a traffic signal plan for review and approval by the City of Escondido Public Works Department. Signal construction shall be completed no more than 90 days after site preparation work begins, which will insure that the signal is operational prior to peak levels of construction worker traffic.

TRANS-9 Prior to the start of construction, the project owner shall negotiate an agreement with the City of Escondido for a payment of its fair share amount toward implementation of ERTC project and cumulative traffic mitigation measures.

Verification: In conjunction with land use entitlements for the ERTC and the Palomar Energy Project, the City of Escondido shall calculate and require payment of the Palomar Energy Project's ongoing operating condition fair share of the "project" and "cumulative" traffic mitigation measures identified in the Escondido Research and Technology Center EIR.

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TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelam, Ph.D.

INTRODUCTION

The electrical energy from the proposed Palomar Energy Project would be delivered to the San Diego Gas and Electric (SDG&E) power grid via a loop-in of the existing overhead SDG&E 230 kV Escondido-Sycamore transmission line passing immediately adjacent to the project site

The purpose of this analysis is to assess the proposed transmission line utilization scheme for potential compliance with requirements concerning the field and non-field impacts of potential significance to human health and safety. If such compliance were established, staff would recommend approval with respect to the issues of concern in this analysis; if not, staff would recommend revisions as appropriate. Since (a) line electric fields depend directly on applied voltage and (b) operational-phase power transmission would be continued at the existing 230 kV, all voltage-related impacts from line operations would remain the same during project operations. Such voltage-related impacts are mostly generated by line electric field component of the line fields. The only line fields that would be changed by project operations are the magnetic fields whose magnitude directly varies with the current in the line. This staff analysis will focus on the following issues as related primarily to the physical presence of the line to be used, 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.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The design-related laws, ordinances, regulations and standards (LORS) that are discussed below by subject area are those that govern the physical impacts of the overhead transmission lines in general and the proposed project line in particular. Staff assesses the potential for significance in terms of compliance with specific federal or state regulations or established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above. However, many local jurisdictions require such lines to be located underground because of the potential for visual impacts on the landscape.

AVIATION SAFETY

Any potential hazard to area aircraft would relate to the potential for collision in the navigable air space. The applicable federal LORS, as discussed below, are intended to ensure the distance and visibility necessary to prevent such collisions.

Federal

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

These discussed LORS were applied to the SDG&E transmission line that the proposed project would tie into at the time the line was built.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Transmission line-related radio-frequency interference is one of the indirect effects of line operation produced by the physical interactions of line electric fields. Since electric fields are unable to penetrate most materials, including the soil, such interference and other electric field effects are not associated with underground lines. The level of any such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for each proposed 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. These regulations were also applied to the proposed project line at the time of construction.

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 itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. SDG&E maintains a specific program in this regard for all its grid power lines.

State

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

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

AUDIBLE NOISE

Industry Standards

As with radio-frequency noise, audible power line noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum, especially in wet weather. There are no design-specific federal regulations to limit the audible noise from transmission lines. As happens with radio noise, such noise is limited through design, construction, or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All modern overhead high-voltage lines (such as the one for this project) are designed to assure compliance. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed for each new line from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from those of less than 345 kV as proposed to be used for this project. 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

Nuisance shocks are electric shocks that result from 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 and are mitigated to reflect the differences in patterns of generation. There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For the proposed project and all modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Line owners such as SDG&E are usually responsible 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 along the route of each new line.

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 California Code of Regulation: "Fire Prevention Standards for Electric Utilities" specifies utility-related measures for fire prevention.

The requirements of these regulations are incorporated into the design of all SDG&E lines.

HAZARDOUS SHOCKS

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

State

- GO-95, CPUC. "Rules for Overhead Line Construction." These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and line workers.
- Title 8, California Code of Regulations, sections 2700 through 2974. "High Voltage Electric Safety Orders." These safety orders establish essential requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

The requirements of these rules and orders were incorporated into the design of the proposed project line, as is standard SDG&E practice.

Local

There are no shock hazard-related requirements on the physical dimensions of power lines at the local level.

Industrial Standards

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within SDG&E and other utility service areas from compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

The possibility of deleterious health effects from electric and magnetic field (EMF) exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by CPUC, other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate, in light of present uncertainty, to recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

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

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency and maintainability, depending on the type and extent of such measures.

State

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. The available evidence has not identified any potential health risk as justifying the retrofit of existing lines. The CPUC further required SDG&E and other electric utilities within its jurisdiction to prepare a specific guideline document listing the specific EMF-reducing measures that would be incorporated into the standard safety designs for all new or upgraded power lines and related facilities within their respective service areas. These reduction measures were

derived from the same general approaches employed over the years within the industry to minimize the fields from all energized lines. The CPUC further established specific limits on the resources to be used in each case to reduce the intensity of the line fields in question. Such limiting requirements were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013.

In keeping with this CPUC policy, staff requires a showing by each applicant that each new or modified overhead line would be designed to incorporate the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability efficiency and maintainability. Therefore, it is up to each applicant to ensure that such measures are applied in ways that prevent significant impacts on line operation and safety. The extent of such applications would be reflected by the ground-level field strengths as measured during operation. When estimated or measured for lines of similar voltage and current-carrying capacity, such field strength values can be used by staff and other regulatory agencies to assess the effectiveness of the applied reduction measures. These field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the support structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required by the CPUC to be designed to incorporate the EMF-reducing guidelines of the electric utility in the service area involved, its fields are required under this CPUC policy to be similar to fields from similar lines in that service area, given that such fields have not been established as posing a health hazard. If a new transmission had been proposed for this Palomar Energy Project, the applicable field-reducing guidelines would have been those of SDG&E. Incorporating such measures into the existing (standard) non field-related SDG&E safety designs would have constituted compliance with present CPUC requirements. With an existing SDG&E line, all such requirements have been met.

Industrial Standards

There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF health issue.

In the face of the present uncertainty, several states have opted for design-driven regulations, which, as with California's, are intended to ensure that fields from new lines are generally similar to those from existing lines of similar voltage and current-carrying capacity. It is for this reason that staff considers it appropriate for the existing 230 kV SDG&E line to be used without retrofit in connection with the proposed Palomar Project.

Some states (Florida, Minnesota, New Jersey, New York, Montana) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe, as do the CPUC and staff, that the present knowledge of the issue does not justify any retrofit of existing lines.

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

SETTING

According to information from the applicant, Palomar Energy, LLC (Palomar 2001a, pages 1-2, 2-1, 2-7, 5.7-1 through 5.7-9, 5.9-1, and 5.10-2), the proposed Palomar Energy Project and related switchyard would be located on a 20-acre site within a planned 186-acre industrial park in the City of Escondido. The existing 230 kV SDG&E transmission line to be used to transmit the generated power is located within a transmission line corridor running along the western boundary of the site. This 230 kV line presently shares this transmission line corridor with seven other lines with voltages of 138 kV, and 69 kV. The magnetic field increases from transmitting the project-related power would occur variously within this shared SDG&E corridor and the rest of the SDG&E grid.

The land use around the proposed project site and the route of the 230 kV line to be utilized is mostly industrial and commercial with a few semi-rural residences, the nearest of which is approximately 1,800 feet to the west of the site. This absence of residences along the route of the line to be utilized means that the residential magnetic field exposure at the root of the present health concern would be insignificant for this project and related facilities. The only project-related EMF exposures of potential significance are the short-term switchyard and tie-in-related exposures to plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in transit across the 230 kV line to be utilized. These types of exposures are short-term, and well understood as not significantly related to the present health concern.

PROJECT DESCRIPTION

The project's proposed interconnection to the SDG&E power grid would be made by way of a new on-site 230 kV project switchyard that would eliminate the need for new project transmission lines (Palomar 2001a, pages 2-23 and 2-51). Avoiding such new project lines was cited by the applicant as an important factor in the choice of this location for the project (Palomar 2001, page 3-6). Since the line to be utilized is an existing SDG&E line, it was designed and built according to standard SDG&E guidelines and will continue to be owned, operated and maintained according to normal SDG&E practices that reflect compliance with existing health and safety LORS.

The power from each of the project's generators would be produced at the relatively low voltage of 18 kV before being stepped-up to 230 kV using a pad-mounted step-up transformer. From this high-voltage part of the step-up transformer, the generated power would be transmitted to the 230 kV connection point at the new project 230 kV switchyard using an underground conductor. It is from this 230 kV switchyard terminal that the loop-in connection would be made with the existing SDG&E grid.

To improve the visual quality across the proposed industrial park, six existing SDG&E lattice transmission towers near the plant site will be replaced with tubular steel poles of an aesthetically sensitive design with the elimination of one lattice tower. Two exiting 69 kV and 12 kV lines (that share a common wooden pole as they cross the project site) are scheduled to be rebuilt or undergrounded by SDG&E as part of the same SDG&E beautification project unconnected with power transmission from the Palomar Energy Project.

IMPACTS

PROJECT SPECIFIC IMPACTS

Since the existing 230 kV line to be used was designed and is currently operated and maintained according to standard SDG&E practices, its design-dependent field strength increases (and therefore, potential contribution to existing area field levels) should be at the same level as from SDG&E lines of the same voltage and current-carrying capacity. As previously noted, the CPUC has not established the fields from such line designs as posing a significant hazard to human health. Staff recommends a specific condition of certification (**TLSN-1**) to provide the data necessary to compare the resulting fields with fields from area SDG&E lines of the same voltage and current-carrying capacity. As already noted, it is the similarity in magnitude between the operational-phase fields within the corridor of the proposed project line and fields from SDG&E lines of the same voltage and current-carrying capacity that would constitute compliance with existing CPUC policy on line field management.

Given the acceptability of this existing line design to the CPUC with respect to aviation safety, nuisance shocks, hazardous shocks, fire hazards and interference with radio-frequency communication, staff considers its proposed use (without modification) in the project's power transmission scheme to be in keeping with CPUC's safety requirements.

The field reduction measures that were utilized in this line design include the following:

Increasing the distance between the conductors and the ground;
Reducing the spacing between the conductors;
Minimizing the current in the line; and
Arranging current flow to maximize the cancellation effects from interacting fields from nearby conductors.

Since these field reducing measures were implemented to the extent that SDG&E recognizes to be without impacts on line safety, efficiency, reliability and maintainability in its service area, staff considers any modification to be unnecessary at this point, but would assess compliance with field strength requirements using the data from the field intensity measurements required in **TLSN-1**.

CUMULATIVE IMPACTS

Since the SDG&E line to be utilized was designed according to standard field-reducing SDG&E guidelines (currently considered adequate by the CPUC without line retrofit) staff expects any contribution to cumulative area exposures to reflect compliance with current CPUC requirements on field contributions from new lines. The actual contribution from the proposed line design would be assessed from results of the field strength measurements specified in **TLSN-1**. Such an assessment would help ensure that total exposures would remain levels not established as hazardous to health.

ENVIRONMENTAL JUSTICE

Energy Commission staff has reviewed Census 2000 information that shows the minority population is less than 50 percent within a six-mile radius of the proposed PEP (please refer to **SOCIOECONOMICS FIGURE 1** in this Staff Assessment). However, as indicated in **SOCIOECONOMICS FIGURE 1**, there are multiple census blocks with greater than 50 percent minority persons within the six-mile radius; staff considers these to be pockets or clusters of minority population. Because Census 2000 information on poverty status is not yet available at the block level, staff reviewed Census 1990 information that shows the low-income population is less than fifty percent within the same radius. Because of existing pockets or clusters of minority population within the six-mile radius, staff has conducted a focused environmental justice analysis for transmission line safety and nuisance.

Since the standard design for the SDG&E transmission line to be used is indended for implementation at all SDG&E service area locations, regardless of minority composition and socioeconomic status, staff believes the use of this transmission line will not result in any transmission line system and nuisance related environmental justice issues related to this project.

COMPLIANCE WITH LORS

Current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of

the main area utility, which for the Palomar Energy Project is SDG&E. Since the existing 230 kV SDG&E was designed, and is operated, and maintained according to standard SDG&E guidelines on field-and non field-related impacts, staff considers its use for the Palomar Energy Project as constituting compliance with the health-and safety-related LORS of concern in this analysis.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have not been established for electric and magnetic fields from existing lines, staff considers any use, of an existing transmission line for a new generation facility as not posing a significant health hazard to humans. The long-term, mostly residential magnetic exposure at the root of the present health concern would be insignificant for the proposed transmission scheme in light of the general absence of residences along the line route involved. On-site worker or public exposures would be short term and at levels expected for SDG&E lines of similar designs and current-carrying capacity. Such exposures are well understood and have not been established as posing a significant health hazard to humans.

The potential for hazardous shocks, nuisance shocks an aviation hazard, audible noise and interference with radio-frequency communication is insignificant and will remain insignificant as with typical SDG&E lines.

RECOMMENDATIONS

Since the transmission line to be utilized is an existing SDG&E line designed to minimize the safety and nuisance impacts of specific concern to staff, and routed through an area with few residences, staff does not recommend further mitigation and recommends approval of its proposed use. If such approval is granted, staff would recommend that the Energy Commission adopt the condition of certification specified below to allow assessment of compliance with present CPUC requirements on line field intensities. The need for specific mitigation would be established from the results of the field measurements involved.

CONDITIONS OF CERTIFICATION

TLSN-1 The applicant shall provide a copy of a contract with SDG&E for SDG&E to measure the strengths of the line electric and magnetic fields as currently encountered within the corridor of the 230 kV line to be used for the proposed project. The fields shall also be measured during the operation of the proposed to allow for assessment of the contributions from the project-related current flow. These field strength measurements shall be made according to IEEE measurement protocols at representative points (on-site and along the line route) necessary to identify the maximum area field exposures possible during project operations.

Verification: The applicant shall obtain the copies of the measurement results and submit them to the CPM within 60 days after they are completed. The operational-

phase measurements shall be initiated no later than 60 days from the start of commercial operations.

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VISUAL RESOURCES

Michael Clayton and Will Walters

SUMMARY

Energy Commission staff analyzed both the potential visual impacts of the proposed Palomar Energy Project (PEP) and the compliance of the project with applicable laws, ordinances, regulations, and standards (LORS). At this time, staff's conclusions are as follows:

- As presently proposed, the project's structures would result in significant visual impacts. Staff has proposed conditions of certification (**VIS-2** through **VIS-4**, and **VIS-7**) to more fully develop and implement the applicant's proposed mitigation measures and reduce structure impacts to levels that would not be significant.
- Staff has concluded that following implementation of staff's conditions of certification, the proposed project would be consistent with six of ten applicable local LORS. In the four cases of project inconsistency with local LORS following implementation of staff's conditions of certification, the inconsistencies would not produce significant visual impacts.
- The proposed project's night lighting has the potential to cause significant visual impacts on nearby residences. Staff's Conditions of Certification **VIS-5** and **VIS-6** would reduce lighting impacts to levels that would not be significant.
- Staff has concluded that project vapor plumes would not result in significant visual impacts.

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether PEP would cause significant adverse visual impacts and whether the project would be in compliance with applicable laws, ordinances, regulations, and standards. The determination of the potential for significant impacts to visual resources resulting from the proposed project is required by the California Environmental Quality Act (CEQA).

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- Description of analysis methodology;
- Description of applicable laws, ordinances, regulations and standards;
- Description of the project aspects that may have the potential for significant visual impacts;
- Assessment of the visual setting of the proposed power plant site and linear facility routes;
- Evaluation of the visual impacts of the proposed project on the existing setting;

- Evaluation of compliance of the project with applicable laws, ordinances, regulations, and standards;
- Identification of measures needed to mitigate any potential significant adverse impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards;
- Conclusions and Recommendations; and
- Proposed Conditions of Certification.

ANALYSIS METHODOLOGY

Visual resources analysis has an inherently subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

Significance Criteria

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

State

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

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Local

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

Professional Standards

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see Smardon et al. 1986). The questions listed below address issues commonly raised in visual analyses

for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

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

Impact Duration

The visual analysis typically distinguishes three different impact durations. **Temporary impacts** typically last no longer than two years. **Short-term impacts** generally last no longer than five years. **Long-term impacts** are impacts with a duration greater than five years.

View Areas and Key Observation Points

The proposed project would be visible from a number of areas in the project region. Energy Commission staff evaluated the visual impact of the project from each of these areas. Staff used Key Observation Points[1], or KOPs, as representative locations from which to conduct detailed analyses of the proposed project and to obtain existing conditions photographs and prepare visual simulations. KOPs are selected to be representative of the most critical locations from which the project would be seen. However, KOPs are not the only locations that staff considered in each view area.

Evaluation Process

For each view area, staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. Staff conducted a site visit and concluded that the KOPs presented in the Application were insufficient for this analysis. Staff requested the addition of two new KOPs (KOPs 8 and 9). Staff also requested that photographs and simulations be revised to life-size scale when viewed from 18 inches (which more accurately conveys the actual viewing experience from a viewpoint). There were also four KOPs that either did not present appropriate public/private views (KOPs 1 and 2) or provided no meaningful view of the project site (KOPs 4 and 5). These KOPs were eliminated from staff's analysis.

[1] The use of KOPs or similar view locations is common in visual resource analysis. The U.S. Bureau of Land Management (USDI BLM 1986a, 1986b, 1984) and the U.S. Forest Service (USDA Forest Service 1995) use such an approach.

The results of staff's analysis are summarized in **VISUAL RESOURCES Appendix VR-1**. Existing conditions photographs and photosimulations from each KOP are presented with all other figures in **VISUAL RESOURCES Appendix VR-3**. The Applicant also provided wide-angle photographs and simulations for KOPs 3, 6, 7, 8, and 9 at a reduced scale (they appear life-size at a viewing distance of 10 inches) which staff reviewed.

Elements of the Visual Setting

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

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. This analysis used an approach that considers visual quality as ranging from outstanding to low. Outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as "picture postcard" landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al. 1994).

Viewer Concern

Viewer concern is a measurement of the level of viewer interest regarding the visual resources in an area. Official statements of public values and goals reflect viewers' expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer concern. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are generally considered to have high viewer concern. However, existing landscape character may temper viewer concern on some State and locally designated scenic highways and corridors. Similarly, travelers on other highways and roads, including those in agricultural areas, may have moderate viewer concern depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses and their occupants, including business parks and hotels, typically have low-to-moderate viewer concern, though some commercial developments have specific requirements related to visual quality, with respect to landscaping, building height limitations, building design, and prohibition of above-ground utility lines, that indicate high viewer concern. Industrial uses typically have the lowest viewer concern because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

Viewer Exposure

The visibility of a landscape feature, the viewing distance to the landscape feature, the number of viewers, and the duration of the view all affect the exposure of viewers to a given landscape feature. Visibility is highly dependent on screening and angle of view. The smaller the degree of screening and/or the closer the feature is to the center of the view area, the greater its visibility is. Increasing distance reduces visibility. Viewer exposure can range from low values for all factors, such as a partially obscured and brief background view for a few motorists, to high values for all factors, such as an unobstructed foreground view from a large number of residences.

Visual Sensitivity

The overall level of sensitivity of a view area to impacts due to visual change is a function of visual quality, viewer concern, and viewer exposure and can range from low to high.

Types of Visual Change

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

Contrast

Visual contrast describes the degree to which a project's visual characteristics or elements (consisting of form, line, color, and texture) differ from the same visual elements established in the existing landscape. The degree of contrast can range from low to high. The presence of forms, lines, colors, and textures in the landscape similar to those of a proposed project indicates a landscape more capable of accepting those project characteristics than a landscape where those elements are absent. This ability to accept alteration is often referred to as visual absorption capability and typically is inversely proportional to visual contrast.

Dominance

Another measure of visual change is project dominance. Dominance is a measure of a feature's apparent size relative to other visible landscape features and the total field of view. A feature's dominance is affected by its relative location in the field of view and the distance between the viewer and the feature. The level of dominance can range from subordinate to dominant.

View Blockage

View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. Blockage of higher quality landscape features by lower quality project features causes adverse visual impacts. The degree of view blockage can range from none to high.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following discussion of federal, state, and local laws, ordinances, regulations, and standards is based on Section 5.10.3 of the Application for Certification (Palomar 2001a, pp. 5.10-21 and 22 and 6-25 and 26) and a review of the *Escondido Research and Technology Center Specific Plan* (City of Escondido 2001).

FEDERAL

The proposed project is located on private land. Therefore, the project is not subject to federal regulations pertaining to visual resources.

STATE

In the project vicinity, no roads or highways are either designated or eligible for State Scenic Highway status (Caltrans 2002). When a highway has been designated

"scenic," the local jurisdiction is required to enact a scenic corridor protection program that protects and enhances scenic resources. A properly enforced program can mitigate the effects of uses that might otherwise detract from the scenic values of the corridor landscape. A corridor protection program would typically stipulate specific siting, landscaping, and screening requirements; as well as require appropriate structural characteristics and surface treatments to make new development more compatible with the existing environment.

LOCAL

The proposed project would be subject to LORS of the City of Escondido. Specifically, the project would be located within the jurisdiction of the Escondido Research and Technology Center Specific Plan (formerly the Quail Hills Specific Plan) which has not yet been adopted but would be in place prior to development of the proposed project. Relevant local LORS and an assessment of the project's LORS consistency are presented in a later section of this analysis.

PROJECT DESCRIPTION

The following section describes the aspects of the project that may have the potential for significant visual impacts, including the power generation and associated facilities, switchyard and electric transmission interconnection, natural gas pipeline, reclaimed water supply pipeline, and brine return pipeline (see **VISUAL RESOURCES Figures 1 through 3 in Appendix VR-3**). It should be noted that the proposed project would only be developed as part of the larger Escondido Research and Technology Center.

POWER PLANT AND ASSOCIATED FACILITIES

The proposed generating facility would be located within the City of Escondido on a 20-acre parcel that includes the 14.1 acre Planning Area 1 of the proposed 186-acre Escondido Research and Technology Center. The power generation facility would consist of a 500 megawatt, natural gas-fired combined cycle power plant. **VISUAL RESOURCES Table 1** presents the dimensions for a number of the project's key components. The most visible features of the proposed power generation facilities would include the two 110-foot tall heat recovery steam generator (HRSG) stacks; the two 85-foot tall HRSGs; the two 75-foot tall combustion turbine-generators; the 65-foot tall, 320-foot long cooling tower consisting of seven cells; and 45-foot tall, 55-foot diameter raw water storage tank. Black iron fencing with vertical one- to two-inch square bars spaced six to twelve inches apart would be installed around the perimeter of the project site (Palomar 2002c, data response 103). The power plant would have a flat, neutral, gray-tan finish (Palomar 2001a, p. 5.10-13).

VISUAL RESOURCES Table 1
Dimensions of Key Project Components

Component	Height (feet)	Length (feet)	Width (feet)	Diameter (feet)
HRSG Units				
• HRSG Casings	85	150	30	
• HRSG Stacks	110			17
Combustion Turbines				
• Combustion Turbine-Generators	75	135	30	
Cooling Tower (7 cells)				
• Cooling Tower	65	320	50	
Tanks				
• Raw Water Storage Tank	45			56
• Demineralized Water Storage Tank	40			30
Buildings				
• Operations Building	25	220	90	
Electric Transmission Facilities				
• H-frame Take-off Structure	80 (approx.)			
• 230 kV Tubular Towers	120 (approx.)			

Source: Palomar 2001a, Table 5.10-3

SWITCHYARD

The proposed switchyard would be located immediately north of the power generation facilities and would directly connect to the San Diego Gas and Electric (SDG&E) transmission system via a loop-in of the existing 230 kV Escondido-Sycamore Canyon transmission line which runs along the western boundary of the proposed project site. Components of the new switchyard, including transformers, take-off structure, and other electrical equipment, would have an industrial appearance. The switchyard facilities would have a flat, neutral, gray-tan finish (Palomar 2001a, p. 5.10-13).

ELECTRICAL TRANSMISSION INTERCONNECTION

Power generated by the proposed project would be transferred to the adjacent SDG&E 230 kV transmission line. The transmission conductors would leave the switchyard by means of an H-shaped take-off structure and head due west to connect to the adjacent 230 kV Escondido-Sycamore Canyon transmission line. While the project would not require the construction of any new transmission lines, the applicant is proposing to replace nine existing lattice structures with eight tubular structures, eliminate one lattice structure, and underground an existing 69-kV transmission line in the adjacent transmission corridor. **VISUAL RESOURCES Figure 3** shows the location of the existing lattice towers to be replaced/removed.

NATURAL GAS PIPELINE

The project would be fueled with natural gas delivered via the SDG&E gas system. An existing 16-inch natural gas pipeline with sufficient capacity to serve the project is located immediately adjacent to the northeast corner of the project site at the end of

Enterprise Street. However, in order to relieve a bottleneck in the existing system, a pipeline upgrade (to 16-inch diameter pipe) would be required for an approximately 2,600-foot long section of eight-inch pipeline located approximately one mile northeast of the project site (see **VISUAL RESOURCES Figure 4**). The upgrade route would be located within city streets and would follow Lincoln Avenue from its intersection with Rock Springs Road to its intersection with Metcalf Street, turning to follow Metcalf Street to its intersection with Mission Avenue (Palomar 2001a, p. 2-52).

WATER SUPPLY PIPELINE

Water for the proposed project would be obtained from the City of Escondido's Hale Avenue Resource Recovery Facility. The proposed project would connect to the Hale Avenue facility via a new 1.1-mile, 16-inch diameter supply pipeline extending from the proposed project to a connection point with an existing City of Escondido reclaimed water main in the Harmony Grove Road right-of-way, immediately northwest of the road's crossing over Escondido Creek (see **VISUAL RESOURCES Figure 7**). From the connection point, the pipeline route extends northwest along Harmony Grove Road to its intersection with Enterprise Street, then southwest and west along Harmony Grove Road to the SDG&E transmission corridor that passes adjacent to the proposed project site. At this point, the water supply pipeline would turn north either along the transmission corridor or the proposed Citracado Parkway to the power plant (Palomar 2001a, p. 2-52).

BRINE RETURN PIPELINE

Brine from the project would be returned to the Hale Avenue facility via a new 1.1-mile, 8-inch diameter return pipeline placed immediately adjacent to the water supply pipeline.

CONSTRUCTION LAY DOWN AREA

During construction of the proposed project, lay down, storage, and other construction support facilities would be located in other areas of the planned industrial park adjacent and to the west of the proposed power plant site.

SETTING

REGIONAL LANDSCAPE

The proposed project would be located in the Escondido Research and Technology Center Specific Plan area of the City of Escondido. This area currently contains varying topography, ranging from moderately steep, hilly terrain, to ravine and associated riparian vegetation, to relatively flat terrain served by existing streets. Urban development consisting of industrial, commercial, and residential uses and transportation infrastructure dominate the regional landscape. None of the roads in the project region have been designated or proposed for state scenic highway status (Palomar 2001a, p. 5.10-1).

PROJECT VIEWSHED

The distance zones used within this analysis are defined as *foreground* (0 to .5 mile), *middleground* (.5 to two miles), and *background* (beyond two miles). Within these zones of influence are a number of viewing opportunities. Most unobstructed views of the project site are from elevated vantage points on the surrounding hills at middleground viewing distances. Most foreground views toward the proposed project from nearby roads and buildings would be substantially screened by other structures, vegetation, or landforms.

IMMEDIATE POWER PLANT VICINITY

The proposed project site is flat to gently sloping and is surrounded by rolling hills. Vegetation in the immediate power plant vicinity consists primarily of low-growing annual grasses and scrub bushes. The site is partially graded and there are a number of electric transmission structures along the western boundary of the project site. A radio tower and control building are also located to the west of the site, while the eastern boundary of the site is bordered by industrial buildings and office parks.

SWITCHYARD AND ELECTRICAL TRANSMISSION INTERCONNECTION

The proposed electrical transmission interconnection is located within the immediate power plant vicinity, described above.

GAS SUPPLY PIPELINE

The proposed gas supply pipeline upgrade is located slightly less than two miles to the northeast of the project site within the project region described above. The gas supply pipeline route is shown in **VISUAL RESOURCES Figure 4** along with the locations of two photographs that were taken to characterize the route. As shown in **VISUAL RESOURCES Figures 5** and **6**, the route would follow the right-of-way of existing streets through a suburban landscape.

WATER SUPPLY PIPELINE

The proposed water supply pipeline would be located underground within the immediate power plant vicinity and project region, described above. The water supply pipeline route is shown in **VISUAL RESOURCES Figure 7** along with the locations of several photographs that were taken to characterize the route. As shown in **VISUAL RESOURCES Figures 8** through **12**, the route would follow the right-of-way of Harmony Grove Road through an area transitioning from rural suburban to urban character.

BRINE RETURN PIPELINE

The proposed brine return pipeline would be located underground within the immediate power plant vicinity and project region, described above. The brine return pipeline route would parallel and be located next to the water supply pipeline route as shown in **VISUAL RESOURCES Figure 7**. As shown in **VISUAL RESOURCES Figures 8** through **12**, the route would follow the right-of-way of Harmony Grove Road through an area transitioning from rural suburban to urban character.

CONSTRUCTION LAYDOWN AREA

The proposed construction laydown area would be located within the immediate power plant vicinity, described above.

VIEWING AREAS AND KEY OBSERVATION POINTS

Staff evaluated the visual setting and proposed project in detail from several viewing areas represented by the following five key observation points including:

- KOP 3 - 1189 Oak View Way, just west of the project site;
- (2) KOP 6 - 768 Hillsboro Way at Via Salerno, north of the project site;
- (3) KOP 7 - 345 Vine Street, east of the project site;
- (4) KOP 8 - 1134 Pasadero Drive, southeast of the project site; and
- (5) KOP 9 - 919 Cycad Drive in the Coronado Hills, west of the project site.

Each of these key observation points is shown on **VISUAL RESOURCES Figure 13**. At each KOP a visual analysis was conducted, the results of which are presented in Appendix VR-1. Existing condition photographs are presented in Appendix VR-3. A discussion of the visual setting for each KOP is presented in the following paragraphs.

KOP 3 –1189 Oak View Way

KOP 3 is located approximately 0.3 mile west-southwest of the project site. This viewpoint was selected to represent the view from the nearest residential neighborhood. **VISUAL RESOURCES Figure 14A** shows the view from KOP 3 to the east-northeast toward the project site. It should be noted the view represented in Figure 14A is presented at substantially less than life-size scale.

Visual Quality

The foreground landscape visible from KOP 3 consists of rolling undeveloped terrain supporting a variety of trees, shrubs, and grasses exhibiting a predominantly natural character. Portions of the landscape are composed of disturbed lands with some debris, and existing electric transmission lines are prominent features along the ridgeline. In spite of the visible land scars and intrusions of infrastructure, the predominant character of the landscape is that of undeveloped, vegetated openspace, and overall visual quality is moderate.

Viewer Concern

Residents along Oak View Way anticipate relatively open views of a foreground landscape of vegetated rolling hills with some land disturbance and noticeable electric transmission infrastructure. However, the lattice design of the existing structures renders them partially “transparent” and they are not perceived as dominant landscape elements. Any increase in industrial character or interruption of panoramic views over the hill crests would be seen as adverse visual changes and viewer concern is moderate-to-high.

Viewer Exposure

Site visibility at this foreground viewing distance of approximately 0.3 mile is moderate-to-high. Although views of the ground-level site are screened by intervening terrain, views of the airspace over the project's footprint (which would be occupied by the project's taller structural forms) would be open and unobstructed. The number of viewers is low but the duration of view would be extended and overall viewer exposure is moderate-to-high.

Overall Visual Sensitivity

For residents along Oak View Way, the moderate visual quality and moderate-to-high viewer concern and viewer exposure lead to a moderate-to-high overall visual sensitivity of the visual setting and viewing characteristics.

KOP 6 – 768 Hillsboro Way at Via Salerno

KOP 6 is located at 768 Hillsboro Way at the intersection with Via Salerno in a new residential subdivision, approximately 0.85 mile due north of the project site. This viewpoint was selected to represent views toward the proposed project from the new residences in this subdivision. **VISUAL RESOURCES Figure 15A** shows the view from KOP 6 to the south toward the project site.

Visual Quality

From this viewpoint, the landscape is dominated by a foreground to middleground urban mosaic of industrial, commercial, and residential uses, punctuated by the linear vertical forms of utility poles and electric transmission and distribution structures. Rolling hills and curvilinear ridgelines form a more naturally appearing backdrop to the urban-suburban foreground that is generally lacking features of intrinsic scenic beauty or visual interest, and overall visual quality is low-to-moderate.

Viewer Concern

Residents of the new subdivision anticipate a foreground to middleground urban-suburban landscape with a prominent energy transmission infrastructure presence. Viewers' expectations would also include generally open, panoramic vistas across the foreground urban development to the more naturally appearing hills and distant ridgelines. Although these views are partially obscured by the intermittent presence of transmission structures, the lattice construction of the towers renders them partially "transparent" and prevents the complete blockage of the hills and ridgelines beyond. Any additional blockage of views or introduction of features with industrial character would be perceived as an adverse visual change. Given the prominence of the urban commercial and industrial character, viewer concern is moderate.

Viewer Exposure

Site visibility is moderate-to-high in that the view of the site from KOP 6 is open and unobstructed though the site is less noticeable at this middleground viewing distance of 0.85 mile. The number of viewers is low though the duration of view for residences would be extended. Overall viewer exposure is moderate.

Overall Visual Sensitivity

The low-to-moderate visual quality combined with the moderate viewer concern and viewer exposure lead to an overall moderate visual sensitivity of the visual setting and viewing characteristics.

KOP 7 – 345 Vine Street

KOP 7 is located at 345 Vine Street, approximately 1.4 miles east-southeast of the project site. This viewpoint was selected to represent the elevated, unobstructed views toward the proposed project site available to residents along this portion of Vine Street. **VISUAL RESOURCES Figure 16A** shows the view from KOP 7 to the west-northwest toward the proposed project site. It should be noted the view represented in Figure 16A is presented at substantially less than life-size scale.

Visual Quality

The elevated perspective at KOP 7 provides a foreground to middleground panoramic vista view of the urban landscape surrounding the project site and the more distant angular ridges to the west. While none of the foreground to middleground landscape features provide substantial visual variety or interest, the vista quality of the view and prominence of the angular ridgeline to the west do enhance the visual quality of the landscape. The overall visual quality is moderate.

Viewer Concern

Residents along Vine Street anticipate a foreground to middleground complex urban landscape that is dominated by commercial and industrial uses. However, any increase in industrial character or additional blockage of the available panoramic vista views of distant hills and ridgelines would be perceived as an adverse visual change, and viewer concern is moderate.

Viewer Exposure

The view of the site from KOP 7 is open and unobstructed with near level sight lines to the project site. The resulting site visibility is moderate-to-high at this middleground viewing distance. While the number of residential viewers is low, the duration of view is extended and overall viewer exposure is moderate.

Overall Visual Sensitivity

The moderate visual quality, viewer concern, and viewer exposure lead to an overall moderate visual sensitivity of the visual setting and viewing characteristics.

KOP 8 –1134 Pasadero Drive

KOP 8 is located at 1134 Pasadero Drive, approximately 0.85 mile southeast of the project site. This viewpoint was selected to represent the unobstructed views toward the proposed project site available to residents in the somewhat elevated residential area around Pasadero Drive. **VISUAL RESOURCES Figure 17A** shows the view from KOP 8 to the northwest toward the proposed project site.

Visual Quality

The elevated perspective at KOP 8 provides a foreground to middleground panoramic vista view of the dense urban landscape to the east and south of the project site. The dominant industrial and commercial features visible from KOP 8 do not contribute visual variety or interest and the resulting visual quality is low-to-moderate.

Viewer Concern

While residents along Pasadero Drive anticipate a foreground to middleground complex urban landscape that is dominated by commercial and industrial uses, any increase in industrial character or additional blockage of the remaining predominantly undeveloped hillsides and ridgelines central to the existing viewshed would be perceived as an adverse visual change. Compared to KOP 7, the developed commercial and industrial landscape surrounding the project site is less prominent in the view from KOP 8 due to vegetative screening, and the project site is substantially closer to the viewer. As a result, changes at the project site would be more prominent in views from KOP 8, compared to KOP 7, and viewer concern is rated moderate-to-high.

Viewer Exposure

The view of the site from KOP 8 is open and unobstructed with near level sight lines to the project site. The resulting site visibility is high at this close middleground viewing distance. While the number of residential viewers is low, the duration of view is extended and overall viewer exposure is moderate.

Overall Visual Sensitivity

The low-to-moderate visual quality somewhat balances the moderate-to-high viewer concern. When combined with the moderate viewer exposure, overall visual sensitivity of the visual setting and viewing characteristics would be moderate.

KOP 9 – 919 Cycad Drive, Coronado Hills

KOP 9 is located at 919 Cycad Drive, approximately 1.5 miles west of the project site. This viewpoint was selected to represent the elevated, unobstructed views toward the proposed project site available to residents in the Coronado Hills area. **VISUAL RESOURCES Figure 18A** shows the view from KOP 9 to the east toward the proposed project site.

Visual Quality

The elevated perspective at KOP 9 provides a panoramic vista view over rural residential hillsides to the undeveloped project site and more intensely developed urban landscape of the City of Escondido to the east of the project site. Beyond are more distant ridgelines that are partially obscured by hazes. The juxtaposition of rural residential hillsides and their pastoral visual character with the more highly developed lower elevations adds visual variety and interest, which combined with the panoramic vista quality of the view, leads to a moderate overall visual quality.

Viewer Concern

Residents along Vine Street anticipate a foreground to middleground rural-suburban landscape of rolling hillsides backdropped by a complex urban landscape. The

introduction of additional industrial character to the undeveloped hills and ridgelines would be perceived as an adverse visual change, and viewer concern is moderate-to-high.

Viewer Exposure

The view of the site from KOP 9 is open and unobstructed with elevated sight lines to the project site. The resulting site visibility is moderate-to-high at this middleground viewing distance. While the number of residential viewers is low-to-moderate, the duration of view is extended. Overall viewer exposure is moderate, reflecting the partial balancing of the moderate-to-high site visibility and extended duration of view by the low-to-moderate number of viewers.

Overall Visual Sensitivity

The moderate visual quality combined with a moderate-to-high viewer concern and moderate viewer exposure lead to an overall moderate visual sensitivity of the visual setting and viewing characteristics.

IMPACTS

CONSTRUCTION IMPACTS

Construction of the proposed power plant and linear facilities would cause temporary adverse visual impacts due to the presence of equipment, materials, and workforce. Construction would involve the use of cranes, heavy construction equipment, temporary storage and office facilities, and temporary laydown/staging areas. Construction would include site clearing and grading, ditching of construction sites, construction of the actual facilities, and site and rights-of-way cleanup and restoration. Views of the laydown area from the north (KOP 6), east (KOPs 7 and 8), and more elevated vantagepoints (KOP 9) would be unobstructed. In order to minimize the visual impact of views of the storage and laydown area(s), staff has proposed Mitigation Measure **seven** and Condition of Certification **VIS-1**, which requires the screening of storage and laydown areas from nearby roads and residences.

The proposed project construction would occur over a 21-month period. Due to the relatively short-term nature of project construction, the adverse visual impacts that occur during construction would not be significant. However, this conclusion assumes that complete restoration of construction areas and pipeline rights-of-way is accomplished. Proper implementation of staff's proposed Mitigation Measure seven and Condition of Certification **VIS-1** would ensure that the visual impacts associated with project construction remain less than significant. While the majority of construction activities would occur during daylight hours, some of the construction activity would take place at night (Palomar 2001a, p. 2-53). The applicant has committed to shielding night lighting and directing lighting downward in a fashion to minimize potential impacts on nearby residential areas (Palomar 2002c, data response 97). However, in order to ensure that significant construction lighting impacts do not occur, staff recommends Mitigation Measure eleven, implemented through Condition of Certification **VIS-5**, presented later in this analysis.

Construction of the gas, water supply, and brine return pipelines would involve the temporary disruption of the area along the rights-of-way by machinery, excavated piles of soil, construction vehicles, and other disturbances associated with pipeline construction.

The gas pipeline would involve construction along the rights-of-way of Lincoln Avenue and Metcalf Street. Pipeline construction equipment would include a 250-cfm air compressor, three backhoe/loaders, one five-ton truck-mounted crane, one welder, one vibratory compactor and one five-ton roller. A typical construction spread would be approximately 200 to 800 feet long and would be visible from a given location for approximately three days (Palomar 2002b, data response 76).

There are 11 single-family residences and approximately 30 multi-family units fronting on the two streets where the gas pipeline upgrade would be installed. Behind these dwelling units closest to the street, there are approximately 80 additional dwelling units set back from the street that could have limited views of the pipeline construction activities (Palomar 2002b, data response 75). The visual impacts of construction would be adverse, but those impacts would not be significant because of the short length of time that the construction activity would be evident along any specific segment of the route in these areas.

The water supply and brine return pipelines would involve construction along the right-of-way of Harmony Grove Road. Pipeline construction equipment would include a 250-cfm air compressor, two backhoe/loaders, one five-ton truck-mounted crane, one welder, one vibratory compactor and one five-ton roller. A typical construction spread would be approximately 60 to 80 feet long and construction activities would be visible from a given location for approximately three days (Palomar 2002b, data response 80).

Ten single-family residences front on Harmony Grove Road along the water supply pipeline construction route. Several scattered single family residences are also located approximately 50 to 150 yards south of Harmony Grove Road near Escondido Creek. An estimated 25 to 30 residences of the Kona Kai neighborhood west of the project site would have a view of the pipeline route as it traverses the project site south to Harmony Grove Road. These residences are approximately 1,500 feet from the pipeline route (Palomar 2002b, data response 79). The visual impacts of construction would be adverse, but those impacts would not be significant because of the short length of time that the construction activity would be evident along any specific segment of the route in these areas.

OPERATION IMPACTS

An analysis of operation impacts was conducted for the view areas represented by the key viewpoints selected for in-depth visual analysis. The results of the operation impact analysis is discussed below by KOP and presented in the Visual Analysis Summary table included as **Visual Resources Appendix VR-1**. The visual impacts of vapor plume formation and night lighting are discussed in separate sections of this analysis. For each KOP, an evaluation of visual contrast, project dominance, and view blockage

is presented with a concluding assessment of the overall degree of visual change caused by the proposed project.

Impacts of Power Plant Structures [Including Transmission Line]

The proposed project would result in the introduction of sizable geometric structures with industrial character to an undeveloped parcel bordered by commercial and industrial development on the north and east and undeveloped lands to the west and south. The most prominent project structures would be the two 110-foot tall HRSG stacks, the 85-foot tall HRSG structures, the 75-foot tall combustion turbine generators (CTGs), the 65-foot tall cooling tower structure consisting of seven cells, and the 55-foot tall raw water storage tank.

The 230 kV electric transmission replacement structures would also be visible in the immediate power plant vicinity. Nine existing 120-foot tall lattice structures would be replaced with eight 120-foot tall tubular structures.

The proposed switchyard would be minimally noticeable immediately north of the power generation facilities. The switchyard would appear smaller in scale though similar in industrial character to the proposed power generation facilities.

KOP 3 – 1189 Oak View Way

VISUAL RESOURCES Figure 14B presents a visual simulation of the proposed project as viewed from KOP 3 at 1189 Oak View Way. The most obvious change to the landscape would be the visibility of the upper portions of the HRSGs and stacks above the ridgeline and the introduction of prominent, vertical, tubular electric transmission structures as replacements for the less prominent lattice structures. However, overall the number of visible transmission line towers would be reduced.

Visual Contrast

The proposed project would introduce the prominent geometric forms and complex lines of the HRSG structures, stacks, and seven-cell cooling tower. The project would also introduce the prominent vertical forms of the tubular electric transmission line towers. These structural characteristics would not be consistent with the forms and lines established by the existing land and vegetative forms or the lattice electric transmission towers. The neutral color of the proposed facilities would be consistent with the color of the existing electric transmission towers, though the scale of these introduced forms and structural masses would be larger than other developed features in the immediate project vicinity. The resulting visual contrast would be moderate-to-high (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The landscape visible from KOP 3 is dominated by the natural forms of the foreground hill and ridgeline. The proposed power plant facilities would appear spatially prominent in the center of the view, and the extension of the HRSG stacks and tubular transmission structures above the ridgeline would contribute to the project's structural prominence. As a result, the proposed project would appear co-dominant with the existing landforms.

View Blockage

From KOP 3 the HRSG structures and stacks and tubular transmission towers (lower quality landscape features) would extend above the ridgeline and would block from view portions of sky (higher quality landscape feature). However, because the amount of sky blocked by the structures is relatively small compared to the amount of visible sky at this KOP, and the blockage is relatively low on the horizon, the resulting view blockage would be moderate.

Overall Visual Change

From KOP 3, the values for visual contrast, project dominance, and view blockage, when taken together, constitute a moderate level of overall visual change.

Visual Impact Significance

When considered within the context of the overall moderate-to-high visual sensitivity of the existing landscape and viewing characteristics, the moderate visual change that would be perceived from KOP 3 would cause an adverse and significant visual impact.

KOP 6 – 768 Hillsboro Way at Via Salerno

VISUAL RESOURCES Figure 15B presents a visual simulation of the proposed project as viewed from KOP 6 at 768 Hillsboro Way in a recently constructed residential subdivision. The most obvious change to the landscape would be the visibility of the HRSG structures and stacks and tubular transmission structures on the crest of the hill to the south.

Visual Contrast

The proposed project would introduce the prominent geometric forms and complex lines of the HRSG structures, stacks, and seven-cell cooling tower. The project would also introduce the prominent vertical forms of the tubular electric transmission line towers. These structural characteristics would generally be consistent with existing forms and lines established by other structural features in the landscape. The neutral color of the proposed facilities would be consistent with the color of the existing electric transmission towers, and the scale of these introduced forms and structural masses would be similar to other developed features in the immediate project vicinity. However, the disruption of the smooth, curvilinear line of the existing hilltop by the hard vertical and horizontal lines of the project structures increases structure prominence and visual contrast. The resulting visual contrast would be low-to-moderate (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The landscape visible from KOP 6 is dominated by the developed industrial and commercial structural forms in the foreground and natural forms of the hill and ridgeline upon which the project would be placed. The proposed power plant facilities would not appear spatially prominent and would not be situated in the center of the view from KOP 6. As a result, the proposed project would appear subordinate to the existing urban development and landforms.

View Blockage

From KOP 6, project structures (lower quality landscape features) would extend above the ridgeline and would block from view portions of sky and more distant hills and ridgeline to the south (higher quality landscape features). However, because the amount of hill background blocked by the structures is quite small relative to the amount of visible hills, and also considering the reduction in view blockage that would occur with the consolidation of electric transmission line structures under the proposed project, the resulting view blockage would be low-to-moderate.

Overall Visual Change

From KOP 6, the overall visual change caused by the proposed project would be low-to-moderate due to the low-to-moderate degree of contrast and low-to-moderate view blockage that would result from the project's visually subordinate structures.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the low-to-moderate visual change that would be perceived from KOP 6 would cause an adverse but not significant visual impact.

KOP 7 – 345 Vine Street

VISUAL RESOURCES Figure 16B presents a visual simulation of the proposed project as viewed from KOP 7 at 345 Vine Street. The most obvious change to the landscape would be the visibility of the HRSGs and stacks, cooling tower, and tubular electric transmission towers above the intermediate and distant ridgelines.

Visual Contrast

The proposed project would introduce the noticeable geometric forms and complex lines of the HRSG structures, stacks, and seven-cell cooling tower. The project would also introduce the noticeable vertical forms of the tubular electric transmission line towers. These structural characteristics would generally be consistent with existing forms and lines established by other structural features in the landscape though their extension above the ridgeline heightens the resulting visual contrast. The neutral color of the proposed facilities would be consistent with the color of the existing electric transmission towers, and the scale of these introduced forms and structural masses would be similar to other developed features in the immediate project vicinity. The resulting visual contrast would be low-to-moderate (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The landscape visible from KOP 7 is dominated by the urban character associated with the developed industrial and commercial structural forms in the foreground and natural forms of the hills and ridges in the background. The proposed power plant facilities would appear spatially prominent in the center of the view from KOP 7, but at this middleground viewing distance, they would appear small in comparison to the broader landscape features. As a result, the proposed project would appear subordinate to the existing urban development and landforms.

View Blockage

From KOP 7, project structures (lower quality landscape features) would extend slightly above the ridgeline and would block from view small portions of sky and the more distant hills and ridgeline to the west (higher quality landscape features). However, the small amount of landscape blocked from view by the proposed project is non-distinct and minimally noticeable. The resulting view blockage would be moderate which is higher than it would otherwise be if the project structures did not extend above the horizon line.

Overall Visual Change

From KOP 7, the values for visual contrast, project dominance, and view blockage, when taken together, constitute a low-to-moderate level of overall visual change.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the low-to-moderate visual change that would be perceived from KOP 7 would cause an adverse but not significant visual impact.

KOP 8 – 1134 Pasadero Drive

VISUAL RESOURCES Figure 17B presents a visual simulation of the proposed project as viewed from KOP 8 at 1134 Pasadero Drive. The most obvious change to the landscape would be the introduction of visually complex industrial structures near the top of the previously undeveloped low rolling hill in the middleground that rises slightly above the existing industrial and commercial development.

Visual Contrast

The proposed project would introduce the prominent geometric forms and complex lines of the HRSG structures, stacks, and seven-cell cooling tower. The project would also introduce the prominent vertical forms of the tubular electric transmission line towers. While the structural forms, neutral color, and size of the proposed project would be somewhat similar to the industrial and commercial structures lower on the hill, the complex industrial character of the power plant and cooling tower would appear noticeably different. The resulting visual contrast would be moderate-to-high (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The landscape visible from KOP 8 is dominated by the natural forms of the immediate-foreground trees along Pasadero Drive and the mosaic of industrial and commercial buildings bordering the project site in the middleground. The proposed power plant facilities would appear spatially prominent in the center of the view and the extension of the HRSG stacks and tubular transmission structures above the ridgeline would contribute to the project's structural prominence. As a result, the proposed project would appear co-dominant with the existing structures and land and vegetative forms.

View Blockage

From KOP 8, the HRSG structures and stacks and tubular transmission towers (lower quality landscape features) would extend above the ridgeline and would block from view portions of the hilltop at the project site and the sky (higher quality landscape feature). However, because the amount of sky blocked by the structures is quite small relative to the amount of visible sky at this KOP, and portions of the hilltop blocked from view has several land scars, the severity of the view blockage is considered less than it might otherwise be if more sky were blocked from view and the visual quality of the blocked hilltop were higher. The resulting view blockage would be moderate.

Overall Visual Change

From KOP 8, the values for visual contrast, project dominance, and view blockage, when taken together, constitute a moderate level of overall visual change.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the moderate visual change that would be perceived from KOP 8 would cause an adverse but not significant visual impact.

KOP 9 – 919 Cycad Drive, Coronado Hills

VISUAL RESOURCES Figure 18B presents a visual simulation of the proposed project as viewed from KOP 9 at 919 Cycad Drive in the Coronado Hills residential area. The most obvious change to the landscape would be the visibility of a complex industrial facility extending above the crest of a hill that was previously only marginally developed with electric transmission infrastructure.

Visual Contrast

The proposed project would introduce the noticeable geometric forms and complex lines of the HRSG structures, stacks, and seven-cell cooling tower. The project would also introduce the noticeable vertical forms of the tubular electric transmission line towers. These structural characteristics would generally be consistent with existing forms and lines established by other structural features in the landscape, though their extension above the intermediate ridgeline heightens the resulting visual contrast. The neutral color of the proposed facilities would be consistent with the color of the existing electric transmission towers, and the scale of these introduced forms and structural masses would be similar to other developed features in the foreground to middleground. At this middleground viewing distance, the resulting visual contrast would be low-to-moderate (see the Visual Analysis Summary table presented as **Visual Resources Appendix VR-1**).

Project Dominance

The landscape visible from KOP 9 is dominated by the rural suburban hillsides in the foreground to middleground and more distant industrial and commercial structural forms. The proposed power plant facilities would appear spatially prominent in the center of the view from KOP 9, but at this middleground viewing distance, they would appear small in comparison to the broader landform features. As a result, the proposed

project would appear subordinate to the existing suburban development and level to rolling landforms.

View Blockage

From KOP 9, project structures (lower quality landscape features) would extend above the ridgeline and would block from view portions of the urban landscape that backdrops the elevated project site. The resulting view blockage would be low-to-moderate.

Overall Visual Change

From KOP 9, the overall visual change caused by the proposed project would be low-to-moderate due to the low-to-moderate degree of contrast and view blockage that would result from the project's visually subordinate structures.

Visual Impact Significance

When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the low-to-moderate visual change that would be perceived from KOP 9 would cause an adverse but not significant visual impact.

Linear facilities

The proposed transmission line and structures and the undergrounding of the existing transmission lines and structures is evaluated above with the power plant structures. The proposed underground natural gas supply line would not be visible following installation except for an occasional warning marker and would not result in adverse visual impacts. Similarly, the water supply and brine return pipelines would be located underground within existing rights of way and would not result in significant visual impacts.

Lighting

At present, there are no lights located on the project site and the site appears completely dark when viewed from KOP 3. There is substantial night lighting located below the project site in the industrial and commercial areas to the north and east that is prominently visible from KOPs 6, 7, and 8. There is a also a substantial amount of visible night lighting from the general project region when viewed from the elevated and more distant vantage point of KOP 9 in the Coronado Hills.

The proposed project would require nighttime lighting for operational safety and security, though the project would not be required to have FAA-style red, flashing warning lights on the HRSG stacks (Palomar 2002b, data response 96). Exterior lights would be designed to minimize the visibility of nighttime lighting to off-site viewers (Palomar 2001a, p. 5.10-3).

Project night lighting would be visible from all of the KOPs and their represented areas. Given the absence of night lighting at the power plant site, the proposed project lighting has the potential to change the character of the existing landscape at night both during construction and operation of the project, resulting in significant visual impacts, particularly when viewed from KOP 3. Even shielded lighting elements could create

significant light and glare impacts as a result of indirect lighting of project structures and backscatter if not properly managed.

Visible Plumes

Staff conducted an independent modeling analysis of project vapor plumes associated with the proposed non-abated heat recovery steam generators (HRSGs) and abated cooling tower and (Walters and Hemmer 2002). In order to model the cooling tower and HRSG plumes, staff used the following information provided by the Applicant: (a) Applicant's AFC (Palomar 2001a, Section 5.10), (b) Data Adequacy Response VIS-5 Appendix B (g) (6) (F) (Palomar 2002a, pp. 5.10-28 to 5.10-30), (c) data responses 110 and 111 (Palomar 2002b), and (d) revised data response 110 (Palomar 2002c). Additionally, staff performed independent psychrometric and dispersion modeling analyses to predict the frequency of visible plumes for each HRSG stack.

Staff uses a frequency threshold to determine whether to perform a more detailed analysis of plume impacts. That threshold is a ten percent or greater frequency of plume occurrence during seasonal[2] daylight no rain/no fog (SDNRNF) hours. Staff typically eliminates from consideration plumes that occur at night or during rain or fog conditions because plume visibility is typically low during those conditions.

Staff's analysis determined that visible plume formation would mainly occur during the cold weather months, with the majority of plume formation occurring at night or early morning. As shown in **VISUAL RESOURCES Table 2** and **VISUAL RESOURCES Table 3,** the predicted unabated HRSG and abated cooling tower plumes for this project would occur less than ten percent of SDNRNF hours. Therefore, project plumes would not result in significant visual impacts and no further visual analysis of visible plumes was conducted.

VISUAL RESOURCES Table 2
Staff Predicted Hours with Abated Cooling Tower Visible Steam Plumes
Miramar 1995 to 2001 Meteorological Data

Measurement Period	Available Hours	Total Plume Hours	Percent
All Hours	50,660	5,740	11.3%
Daylight Hours	26,963	1,431	5.3%
Seasonal Daylight No Rain / No Fog Hours	11,291	793	7.0%

[2] "Seasonal" is defined as the six consecutive months per year when the potential for plume formation is greatest. The months considered for a particular project are determined by the meteorological data used for that project. Usually the months are November through April, as is the case for this project.

VISUAL RESOURCES Table 3
Staff Predicted Hours with HRSG Visible Steam Plumes
Miramar 1997 to 1999 Meteorological Data

Measurement Period	Available Hours	Unabated HRSG No Duct Firing		Unabated HRSG With Duct Firing	
		Total Plume Hours	Percent	Total Plume Hours	Percent
All Hours	26,280	392	1.5%	1,600	6.1%
Daylight Hours	13,323	37	0.3%	211	1.6%
Seasonal Daylight No Rain Hours	5,807	35	0.6%	179	3.1%

CONSIDERATION OF IMPACTS IN RELATION TO CEQA SIGNIFICANCE CRITERIA

This analysis considered the potential impacts of the proposed project in relation to the four significance criteria for visual resource impacts listed in Appendix G of the CEQA Guidelines, under Aesthetics, specified below.

1. **Would the project have a substantial adverse effect on a scenic vista?**

There are no scenic vistas in the project region so the proposed project would not result in significant visual impacts under this criterion.

2. **Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?**

The proposed project is not located within the viewshed of a state designated or eligible scenic highway. Therefore, project structures would not result in significant visual impacts under this criterion.

3. **Would the project substantially degrade the existing visual character or quality of the site and its surroundings?**

As discussed in a previous section of this analysis, the proposed project would introduce prominent structures of industrial character into the foreground to middleground views from nearby residences. The resulting visual change would range from low-to-moderate to moderate depending on viewpoint location. Viewers at nearby residences in the view area represented by KOP 3 would experience substantial visual degradation and a significant visual impact under this criterion.

4. **Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?**

The project has the potential to create a new source of substantial light that would adversely affect nighttime views in the area and result in a significant visual impact under this criterion.

CUMULATIVE IMPACTS

Cumulative impacts to visual resources could occur where project facilities or activities (such as construction) occupy the same field of view as other built facilities or impacted landscapes. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as disturbed vegetation), even if the new structures are not within the same field of view as the existing structures. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; (3) visual quality is diminished; or (4) the project's visual contrast is increased.

Table 4 lists the three projects that have been identified for cumulative impact analysis.

The PEP would be part of the Escondido Research and Technology Center (ERTC). The Specific Plan Area (SPA) for the ERTC consists of 186 acres. Approximately 22 acres of the SPA are existing and proposed residential areas that are not part of the ERTC project. Of the approximately 164 acres that comprise the ERTC project, approximately 92 acres would be devoted to building pads. The proposed power plant site consists of 14.1 acres, and would occupy Planning Unit I of the ERTC. The other land uses proposed for the ERTC consist of light industrial uses (processing, assembling, manufacturing, warehousing, research and development, and distribution, and accessory uses), service industries, and open space. The City of Escondido is currently conducting a separate CEQA review of the ERTC Specific plan. Staff is reviewing the draft Environmental Impact Report (EIR) that the City released on July 26, and will provide comment on the draft EIR in early September.

Under the proposed ERTC Specific Plan, the PEP would be by far the largest and tallest structure in the ERTC. The PEP would contribute substantially to the cumulative visual impact of the ERTC, though if ERTC were built as proposed in the Specific Plan, the new buildings would screen the PEP from view in whole or part from some KOPs. In particular, a visual simulation provided in the AFC indicates that the buildings proposed as part of ERTC would effectively screen the power plant from KOP 3, from which the PEP would otherwise have a significant impact without staff's proposed mitigation (Palomar 2001a, Figure 5.10-4c and -4d). Staff has not considered this potential screening in its analysis of PEP because the effectiveness of such possible screening is speculative. Although PEP is dependent for LORS consistency on City approval of the ERTC Specific Plan, and is physically dependent on the completion of grading for ERTC, the timing of the build-out of the remainder of ERTC is currently uncertain. In addition, the dimensions and specific locations of future buildings may not correspond to what is currently included in the ERTC Specific Plan or what is depicted in the visual simulation, and may not provide effective screening.

Staff plans to hold a workshop on the feasibility of visual mitigation that will, in part, consider the consistency of staff's proposed mitigation with the ERTC Specific Plan, and will allow further discussion and evaluation of the cumulative impacts of the ERTC and PEP. Based on staff's analysis to date, staff believes that, with implementation of appropriate mitigation, the cumulative impact of the ERTC, including the PEP, would not be significant.

The CalPeak project is a 49 MW peaking power plant that is located on Vineyard Avenue, adjacent to the north boundary of the proposed project site. From KOPs 6, 7, and 9, the CalPeak project is visible in the same field of view as the proposed project. The CalPeak project is not visible from KOPs 3 and 8. From the three KOPs where CalPeak is visible, it is most noticeable from KOP 6. However, the scale of the project is sufficiently small that the project structures are barely noticeable and appear to be an integrated part of the overall urban landscape that dominates the foreground to middleground view north of the project site. For all three KOPs where both the proposed project and the CalPeak project are visible in the same field of view, the resulting cumulative visual impact would be adverse but not significant.

The RAMCO project is a 44 MW peaking power plant that is located on Don Lee Place, approximately 0.5 mile northwest of the proposed project site. The RAMCO project is not visible in the same field of view as the proposed project from any of the five KOPs established to evaluate visual impacts. Therefore, there would be no cumulative visual impact with respect to the RAMCO project.

No existing vapor plume sources have been identified in the immediate project vicinity and no cumulative visual impacts are anticipated to result from the proposed project's vapor plumes.

VISUAL RESOURCES Table 4
List of Cumulative Projects

Project Number	Description	Visible in Proposed Project Field of View	Cumulative Impact and Significance
1	Escondido Research and Technology Center	YES All KOPs	Adverse but Not Significant (with mitigation)
2	CalPeak: A 49 MW peaking power plant located on Vineyard Avenue, adjacent to the north boundary of the proposed project site.	YES KOPs 6, 7, and 9 ---------- NO KOPs 3 and 8	Adverse but Not Significant
3	RAMCO: A 44 MW peaking power plant located on Don Lee Place, approximately 0.5 mile northwest of the proposed project site.	NO All KOPs	No Impact

ENVIRONMENTAL JUSTICE

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

Based on the visual resources analysis, staff found that neither construction nor operation of the proposed project would cause significant direct or cumulative visual impacts on minority populations. Therefore, there are no visual resources environmental justice issues related to this project.

FACILITY CLOSURE

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure**.**

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to prepare will address removal of the power plant structures.

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

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 would address removal of the power plant structures. No special conditions regarding visual resources are expected to be required to address any of the three types of closure.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LOCAL

Nine local LORS were found to pertain to the enhancement and/or maintenance of visual quality and the protection of views. **VISUAL RESOURCES Table 5** provides a

listing of the relevant local LORS from the Escondido Research and Technology Center Specific Plan, which has not, yet been adopted, but would be in place prior to development of the proposed project. Based on staff's preliminary analysis, it appears that, following effective implementation staff's conditions of certification, the proposed project would be consistent with six of the ten local goals, objectives, and policies referenced in Table 5. In the four cases of project inconsistency with local LORS following implementation of staff's conditions of certification, the inconsistencies would not produce significant visual impacts.

VISUAL RESOURCES Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before/After Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
Escondido Research and Technology Center Specific Plan			
II. Business Park-Wide Policies and Standards: C. Design Policies	Goal: "…to create a visual and aesthetic coherence internally and externally to the project.	NO/YES	The complex industrial appearance of the proposed project would not appear consistent with the prevailing development character established by the surrounding business parks, commercial uses, and residential areas. Effective implementation of all mitigation measures and staff's Condition of Certification **VIS-4** (requiring screening) would bring the proposed project into compliance with this requirement.

VISUAL RESOURCES Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before/After Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
II. Business Park-Wide Policies and Standards: C. Design Policies	Project Design Feature (a): The elements of design and their composition shall exhibit visual simplicity.	NO/NO	The complex industrial appearance of the proposed project would not be composed of simple forms and lines and would not appear simple in terms of design or composition. It is staff's opinion that the only way to achieve consistency with this policy is to incorporate structural shields or enclosures into the project design to hide or otherwise disguise the industrial/structural complexity of the project as proposed.
II. Business Park-Wide Policies and Standards: E. General Architectural Standards	Project Design Features (a): Architectural features exhibited by projects within Escondido Research and Technology Center will be simplistic but refined.	NO/NO	The complex industrial appearance of the proposed project would not be composed of simple forms and lines and would not appear simple in terms of design or composition. It is staff's opinion that the only way to achieve consistency with this standard is to incorporate structural shields or enclosures into the project design to hide or otherwise disguise the industrial/structural complexity of the project as proposed.

VISUAL RESOURCES Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before/After Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
II. Business Park-Wide Policies and Standards: E. General Architectural Standards	6. Mechanical Equipment (a): All exterior and electrical equipment, including HVAC, vents, stacks, storage tanks, communications antennas and satellite dishes shall typically be screened using building parapets. Otherwise the use of mechanical screens may be required.	NO/NO	The proposed project is not proposing the use of any type of structural screens (Palomar 2002c, data response 104). It is staff's opinion that the only way to achieve consistency with this standard is to incorporate structural shields or enclosures into the project design to hide or otherwise disguise the industrial/structural complexity of the project as proposed.
II. Business Park-Wide Policies and Standards: E. General Architectural Standards	8. Materials (b): The primary wall surface material is intended to provide a uniform aesthetically pleasing exterior finish. Stone veneer, painted concrete, glass curtain wall and combinations of these elements shall make up the primary building materials.	NO/NO	The primary structural surface material to be used for the proposed project would be metal. The resulting surface texture would not appear consistent with the required surface materials. It is staff's opinion that the only way to achieve consistency with this standard is to either use the surfacing materials referenced in the standard or to treat project surfaces with materials or finishes that simulate the referenced materials.

VISUAL RESOURCES Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before/After Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
II. Business Park-Wide Policies and Standards: F. General Landscape Standards	Objective: Landscapes will screen or enhance views as desirable, accent or buffer new architecture, orient vehicles and pedestrians, and provide public recreational opportunities. The intent of the landscape architecture is to integrate the project into the existing community fabric, and to enhance Escondido's sense of place as a business environment.	NO/YES	The proposed landscaping would not adequately screen the proposed project from the residential views represented by KOPs 3, 6, 7, 8, and 9. The proposed project would not appear well integrated into the existing landscape. Effective implementation of staff's Condition of Certification **VIS-4** would bring the proposed project into compliance with this requirement.
II. Business Park-Wide Policies and Standards: J. Signage	Objective: Signs shall be minimized and of non-glare materials and unobtrusive colors.	PARTIALLY / YES	As stated in the Applicant's Mitigation Measure 4, signs at the entrances to the plant site will be of materials that minimize glare and are unobtrusive. Effective implemen-tation of staff's Condition of Certification **VIS-7** would bring the proposed project into compliance with this requirement.

VISUAL RESOURCES Table 5
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination Before/After Mitigation/ Conditions	Basis for Consistency
Source	**Description of Principles, Objectives, and Policies**		
II. Business Park-Wide Policies and Standards: K. Lighting Standards	3. On-Site Lighting (b): Any outdoor lighting facility or fixture shall be shielded, be equipped with automatic timing devices and be limited to the amount of light necessary to illuminate the intended object.	PARTIALLY / YES	As stated in the Applicant's Mitigation Measure 5, lighting at the plant would be limited to areas required for safety and security, and would be directional to minimize spillover onto adjacent properties. Effective implementation of staff's Conditions of Certification **VIS-5** and **VIS-6** would bring the proposed project into compliance with this requirement.
III. Planning Area Development Standards	6. Building Height: In the event Planning Area 1 is developed pursuant to Alternative B, the height limitation specified for Alternative A [60-foot building height] shall be applied to the operations building only, and the maximum height of exhaust stacks shall be 120 feet above the finished floor elevation.	YES/YES	AFC Table 5.10-3 states that the Operations Building would be 25 feet in height and the HRSG stacks would be 110 feet in height.
III. Planning Area Development Standards	12. Walls/Fencing: For Alternative B, the perimeter of Planning Area 1 shall be secured with aesthetic steel fencing or screen walls, selected as appropriate for specific visual settings along the perimeter.	YES/YES	The proposed project would include the use of aesthetic steel fencing along the project perimeter.

MITIGATION

APPLICANT'S PROPOSED MITIGATION MEASURES

The applicant has proposed six mitigation measures to be incorporated into the project design to minimize visual impacts associated with the operation of the facility:

The power plant structures will be arranged to make maximum use of the visual screening afforded by site topography The plant site will incorporate berms, trees, and other landscaping that provides further visual screening in order to minimize visual

impacts on the surrounding area, in accordance with the ERTC Specific Plan criteria for Planning Area 1.
All structures, exhaust stacks, buildings, and tanks will be constructed of materials that limit glare, and they will be finished with flat, neutral tones that blend with the surrounding environment.
The perimeter of the plant site shall be secured with aesthetic steel fencing or screen walls, selected as appropriate for specific visual settings along the perimeter. The site perimeter fencing will be treated or painted to blend with the surrounding environment.
Signs at the entrances to the plant site will be constructed of materials that minimize glare, and will be painted using colors that are unobtrusive.
Lighting at the plant site will be limited to areas required for safety and security, and will be directional to minimize spillover onto adjacent properties.
A plume-abated cooling tower will be used to minimize visible water vapor plumes from the cooling tower.

ADDITIONAL MITIGATION PROPOSED BY STAFF

Energy Commission staff have identified potential significant visual impacts resulting from visibility of project structures and night lighting. Although staff generally agrees with the applicant's proposals to mitigate project structure and lighting impacts, staff's position is that some of these mitigation measures need to be more precisely developed and, in some cases, expanded in conditions of certification to ensure mitigation of these potential impacts to less than significant levels. Staff has proposed other conditions of certification to ensure that the project's appearance will conform to that described and depicted by the applicant. Without such conditions staff cannot state that the project would not cause other significant visual impacts.

The portion of the applicant's Mitigation Measure 1 regarding structure arrangement is addressed in Condition of Certification **VIS-2**. The portion of the applicant's Mitigation Measure 1 regarding screening is addressed in Condition of Certification **VIS-4**. Because the proposed on-site landscaping would not be tall enough to screen any of the portions of the project that would cause a significant visual impact from KOP 3, it would not be effective. Therefore, staff proposes that the applicant provide off-site landscaping to screen the upper portions of the project from the view area represented by KOP 3. Applicant's Mitigation Measure 2 regarding surface and color treatment of project structures is addressed in Condition of Certification **VIS-3**. The portion of the applicant's Mitigation Measure 3 regarding on-reflective/non-glare fencing is addressed in Condition of Certification **VIS-3**. The remainder of applicant's Mitigation Measure 3 is not addressed in staff's conditions of certification because the use of screen walls or steel fencing would have no mitigating effect on the project's significant visual impact from KOP 3, because it would not be tall enough to provide any visual screening. Applicant's Mitigation Measure 4 regarding signage is addressed in Condition of Certification **VIS-7**. Applicant's Mitigation Measure 5 regarding night lighting control is addressed in Conditions of Certification **VIS-5** and **VIS-6**. Applicant's Mitigation Measure 6 regarding a plume-abated cooling tower is addressed in Condition of Certification **VIS-8**.

Mitigation of Construction Impacts

Construction of the proposed power plant and gas, water supply, and brine return pipelines would result in adverse visual impacts. Staff has proposed Mitigation Measure 7 to ensure that visual impacts resulting from project construction do not become significant.

The project owner shall ensure that visual impacts of project construction are adequately mitigated. The project owner shall require from its contractors that all facility construction sites and staging, material, and equipment storage areas be visually screened from adjacent public roads and nearby residences. Upon completion of construction, all evidence of project construction activities, including ground disturbance due to staging and storage areas, shall be removed and all disturbance shall be remediated to its pre-construction condition. Any vegetation removed in the course of construction will be replaced on a one-to-one, in-kind basis as appropriate. Such replacement planting shall be monitored for a period of three years to ensure survival. During this period, all dead plant material shall be replaced (see also Condition of Certification **VIS-1**).
Effective implementation of Mitigation Measure 7, through Condition of Certification **VIS-1**, will minimize the intrusiveness of project construction and keep construction visual impacts to less than significant levels.

Mitigation of Impacts of Proposed Structures

As presently proposed, the project's structures would result in adverse visual impacts when viewed from nearby residences (as illustrated in views from KOP 3). Staff has proposed Mitigation Measures 8 and 9 to enhance the effectiveness of the Applicant's Mitigation Measures 1 and 2 and to help blend project structures with the existing landscape.

The proposed project structures shall be arranged on the site in such a manner as to make maximum use of the visual screening afforded by site topography. Site layout and topographic screening is to conform to the visual simulations provided as **VISUAL RESOURCES Figure 14B**. The project owner shall submit for CPM review and approval, a specific plan whose proper implementation will satisfy these requirements (see also Condition of Certification **VIS-2**).
Prior to first turbine roll, the project owner shall treat all project structures, buildings, and fences in appropriate colors or hues that minimize visual intrusion and contrast by blending with the landscape, such that those structures, buildings, and fences have surfaces that do not create glare; and such that they are consistent with local laws, ordinances, regulations, and standards. The project owner shall submit for CPM review and approval, a specific treatment plan whose proper implementation will satisfy these requirements (see also Condition of Certification **VIS-3**).
Effective implementation of Mitigation Measure 8, through Condition of Certification **VIS-2,** and Mitigation Measure 9, through Condition of Certification **VIS-3**, would minimize structural contrast and keep structural visual impacts to less than significant levels.

Staff has also proposed Mitigation Measure 10 to enhance the effectiveness of the Applicant's proposed landscaping commitment for project screening, to mitigate the

potential significant visual impact to the view area represented by KOP 3, and to achieve compliance with local LORS.

The project owner shall provide landscaping that is effective in screening the proposed project from nearby residences to the west of the project site. Trees and other vegetation consisting of informal groupings of fast-growing evergreen trees shall be strategically placed, and of sufficient density and height, to effectively screen the complex, industrial-appearing structural forms within five years of completion of project construction. The project owner shall submit for CPM review and approval, a specific landscaping plan whose proper implementation will satisfy these requirements (see also Condition of Certification **VIS-4**).
Staff proposes an accelerated landscape screening strategy because otherwise the project would cause a significant long-term (greater than five years) visual impact. Effective implementation of Mitigation Measure 10, through Condition of Certification **VIS-4**, will reduce project visibility and keep structural visual impacts to less than significant levels.

Mitigation of Project Lighting Impacts

As previously discussed, the proposed project lighting has the potential to change the character of the existing landscape at night both during construction and operation of the project and could result in significant visual impacts to nearby residences. Therefore, staff proposes Mitigation Measures 11 and 12 to mitigate project night lighting impacts.

The project owner shall ensure that lighting for construction of the power plant and linear facilities is used in a manner that minimizes potential night lighting impacts. The project owner shall submit for CPM review and approval, a specific lighting plan whose proper implementation will satisfy these requirements (see also Condition of Certification **VIS-5**).

The project owner shall design and install all permanent lighting such that light bulbs and reflectors are not visible from public viewing areas, lighting does not cause reflected glare, and illumination of the project, the vicinity, and the nighttime sky is minimized. The project owner shall submit for CPM review and approval, a specific lighting plan whose proper implementation will satisfy these requirements (see also Condition of Certification **VIS-6**).

Effective implementation of Mitigation Measures 11 and 12, through Conditions of Certification **VIS-5** and **VIS-6**, will minimize lighting and keep lighting impacts to less than significant levels.

Mitigation of Project Signage Impacts

Staff proposes Mitigation Measure 13 to ensure that project signage does not cause significant visual impacts.

The project owner shall develop a signage plan that is consistent with the requirements of the Escondido Research and Technology Center Specific Plan, Part II, Section J (Signage). The project owner shall submit for CPM review and approval, a specific

signage plan whose proper implementation will satisfy the Specific Plan requirements (see also Condition of Certification **VIS-7**).

Effective implementation of Mitigation Measure 13, through Condition of Certification **VIS-7**, would keep signage impacts to less than significant levels.

Mitigation of Impacts in Relation to CEQA Significance Criteria

The proposed project has the potential to cause significant visual impacts with respect to two of the four CEQA significance criteria. From the view area represented by KOP 3, project structures would substantially degrade the existing character and quality of the site and its surroundings (Criterion 3). The Applicant's Mitigation Measure 1 would require the arrangement of project structures to make maximum use of the visual screening afforded by site topography. This measure also requires the use of berms, trees, and other landscaping to further screen the project and minimize visual impacts on surrounding areas. Staff's Mitigation Measure 8 and Condition of Certification **VIS-2** further augment the requirements for appropriate structure arrangement. Staff's Mitigation Measure 10 and Condition of Certification **VIS-4** further augment the requirements for landscape screening of project structures. The Applicant's Mitigation Measure 2 would require the use of materials that limit glare and the use of flat, neutral-tone finishes to blend project structures with the surrounding landscape. Staff's Mitigation Measure 9 and Condition of Certification **VIS-3** further augment the requirements for structural treatment and finishes. Applicant Mitigation Measure 4 requires that signs be constructed of materials that minimize glare, and be painted with unobtrusive colors. Staff's Mitigation Measure 13 and Condition of Certification **VIS-7** further augment the requirements for project signage. Effective implementation of the Applicant's proposed mitigation measures as augmented by staff's mitigation measures and conditions of certification would reduce the visual impacts of project structures under Criterion 3 to levels that would not be significant.

The project's night lighting has the potential to create a new source of substantial light that would adversely affect nighttime views in the area and result in a significant visual impact under Criterion 4. However, the exterior lighting control measures proposed in the Applicant's Mitigation Measure 5 and augmented in staff's Mitigation Measures 11 and 12 and Conditions of Certification **VIS-5** and **VIS-6** would ensure that lighting impacts would be less than significant with regard to Criterion 4.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the project, as proposed, would cause adverse and significant visual impacts. However, with effective implementation of staff's additional mitigation measures and conditions of certification, the project's significant visual impacts would be reduced to levels that would be less than significant.

In the four cases of project inconsistency with local LORS either the inconsistencies would initially not produce a significant visual impact, or with effective implementation of

staff's proposed conditions of certification, the impacts causing the inconsistencies would not be significant.

Since the proposed project would not cause significant visual impacts on minority populations, there would be no environmental justice issues for visual resources.

RECOMMENDATIONS

The Energy Commission should adopt the following conditions of certification if it approves the project. Because there is some uncertainty regarding the applicant's ability to accomplish the necessary landscape screening, particularly within staff's five-year time requirement, the Energy Commission staff should convene a workshop to evaluate the feasibility of Condition of Certification **VIS-4**. The workshop should address vegetation species to be used, specimen size at planting, planting locations to achieve effective screening placement, the appropriateness of additional measures to enhance screening effectiveness such as the use of berms, and consistency of possible mitigation measures with the ERTC Specific Plan. It is particularly important that Condition of Certification **VIS-4** be effectively implemented in order to adequately mitigate the significant visual impact that would result from the project's structures.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 The project owner shall ensure that visual impacts of project construction are adequately mitigated. To accomplish this, the project owner shall require the following as a condition of contract with its contractors to construct the proposed project:

If visible from nearby residences and roadways, the project site as well as staging and material and equipment storage areas shall be visually screened. All evidence of construction activities, including ground disturbance due to staging and storage areas and pipeline construction, shall be removed and remediated upon completion of construction

The project owner shall submit to the CPM for review and approval and to the City of Escondido for review and comment a specific screening and restoration plan whose proper implementation will satisfy these requirements.

The project owner shall not implement the restoration plan until receiving written approval from the CPM.

Verification: At least 90 days prior to project construction, the project owner shall submit the screening and restoration plan to the CPM for review and approval and to the City of Escondido for review and comment.

If the CPM notifies the project owner that any revisions of the screening and restoration plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days after installing screening at staging and material and equipment storage areas that it is ready for inspection.

The project owner shall notify the CPM within seven days after completing the surface restoration that it is ready for inspection.

VIS-2 The proposed project structures shall be arranged on the site in such a manner as to make maximum use of the visual screening afforded by site topography. Site layout and topographic screening is to conform to the visual simulation provided as **VISUAL RESOURCES Figure 14B**. The project owner shall submit for CPM review and approval, a specific plan whose proper implementation will satisfy these requirements:

The project owner shall submit to the CPM for review and approval and to the City of Escondido for review and comment a site development plan whose proper implementation will satisfy these requirements.

The project owner shall not implement the site development plan until receiving written approval from the CPM.

Verification: At least 90 days prior to project construction; the project owner shall submit the site development plan to the CPM for review and approval and to the City of Escondido for review and comment.

If the CPM notifies the project owner that any revisions of the site development plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days after completing final grading that the site is ready for inspection.

VIS-3 Prior to first turbine roll, the project owner shall treat the surfaces of all project structures and buildings visible to the public such that their colors minimize visual intrusion and contrast by blending with the landscape; their surfaces do not create glare; and they are consistent with local laws, ordinances, regulations, and standards. The project owner shall submit for CPM review and approval, and to the City of Escondido for review and comment a specific treatment plan whose proper implementation will satisfy these requirements. The treatment plan shall include:

a) Specification, and 11” x 17” color simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture;

b) A list of each major project structure, building, tank, transmission line tower and/or pole, and fencing specifying the color(s) and finish proposed for each (colors must be identified by name and by vendor brand or a universal designation);

c) Two sets of brochures and/or color chips for each proposed color;

d) Samples of each proposed treatment and color on each material to which they would be applied that would be visible to the public;

e) A detailed schedule for completion of the treatment; and

f) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated on site, until the project owner receives notification of approval of the treatment plan by the CPM.

Verification: The project owner shall submit its proposed treatment plan at least 90 days prior to ordering the first structures that are color treated during manufacture.

If a revision is required, the project owner shall provide the CPM with a revised plan within thirty 30 days of receiving notification that revisions are needed.

Prior to first turbine roll, the project owner shall notify the CPM that all buildings and structures are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-4 The project owner shall provide off-site landscaping that is effective in screening the proposed project from nearby residences west of the project site. Vegetation consisting of informal groupings of fast-growing species, predominantly evergreen trees, must be strategically placed and of sufficient density and height to effectively screen the upper portions of the project within five years after first turbine roll. The use of berms should be considered as a means to help fulfill this requirement.

The project owner shall submit a landscaping plan to the CPM for review and approval and to the City of Escondido for review and comment. The plan shall include:

a) an 11”x17” color simulation of the proposed landscaping at 5 years as viewed from KOP 3; and

b) a detailed list of plants to be used and times to maturity given their size and age at planting.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM. However, the planting must be completed by start of project operation.

Verification: Prior to first turbine roll and at least 90 days prior to installing the landscaping, the project owner shall submit the landscaping plan to the CPM for review and approval and to the City of Escondido for review and comment.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscaping, that the landscaping is ready for inspection.

VIS-5 The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

a) All lighting shall be of minimum necessary brightness consistent with worker safety.
b) All fixed position lighting shall be shielded, hooded, and directed downward to minimize backscatter to the night sky and direct light trespass (direct lighting extending outside the boundaries of the construction area).
c) Wherever feasible and safe, lighting shall be kept off when not in use and motion detectors shall be employed.
d) A lighting complaint resolution form (following the general format of that in Appendix VR-2) shall be used by plant construction management, to record all lighting complaints received and to document the resolution of that complaint.

Verification: Within seven days after the first use of construction lighting, the project owner shall notify the CPM that the lighting is ready for inspection.

If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 15 days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM that the modifications have been completed.

The project owner shall report any lighting complaints and documentation of resolution in the Monthly Compliance Report, accompanied by any lighting complaint resolution forms for that month.

VIS-6 The project owner shall design and install all permanent lighting such that light bulbs and reflectors are not visible from public viewing areas; lighting does not cause reflected glare; and illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

a) Lighting shall be designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of the lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

b) All lighting shall be of minimum necessary brightness consistent with worker safety;

c) High illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have switches or motion detectors to light the area only when occupied;

d) A lighting complaint resolution form (following the general format of that in Appendix VR-2) shall be used by plant operations to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

Verification: At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and comment written documentation describing the lighting control measures and fixtures, hoods, shields proposed for use, and incorporate the CPM's comments in lighting equipment orders.

Prior to first turbine roll, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

The project owner shall report any complaints about permanent lighting and provide documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.

VIS-7 The project owner shall develop a signage plan that is consistent with the requirements of the Escondido Research and Technology Center Specific Plan, Part II, Section J (Signage). In addition, the project owner shall install minimal signage, which shall be constructed of non-glare materials and unobtrusive colors. The design of any signs required by safety regulations shall conform to the criteria established by those regulations. The project owner shall submit a signage plan for the project to the CPM for review and approval and to the City of Escondido for review and comment. The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: Prior to first turbine roll and at least 90 days prior to installing signage, the project owner shall submit the plan to the CPM for review and approval and to the City of Escondido for review and comment.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of signage that they are ready for inspection.

VIS-8 The project owner shall reduce the project's cooling tower visible vapor plumes by the following method. The project owner shall employ a wet/dry plume abated cooling tower with an abatement performance no worse that that described by the confidential fogging frequency curve presented to the Commission as supplemental data response 110, which can be represented

as a plume abatement design point of 51.5°F and 90.5 percent relative humidity (Marley 2002). An automated control system shall be used to ensure that plumes are abated to the maximum extent possible for the stipulated design point.

Verification: At least 30 days prior to first turbine roll, the project owner shall provide to the CPM for review and approval the specifications for the automated control systems and related systems and sensors that will be used to ensure maximum plume abatement for the wet/dry cooling tower plume abatement systems.

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APPENDIX VR – 1: SUMMARY OF ANALYSIS

APPENDIX VR – 2

LIGHTING COMPLAINT RESOLUTION FORM

Palomar Energy Project City of Escondido, California
Complainant's name and address: Phone number:
Date complaint received: Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted:
Description of corrective measures taken: Complainant's signature: _____ Date:
Approximate installed cost of corrective measures: $ Date installation completed: Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct: Plant Manager's Signature:

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

APPENDIX VR – 3

VISUAL RESOURCES FIGURES 1 THROUGH 18B

VISUAL RESOURCES Figure 1

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
1	Figure 2.4-1 Palomar 2001a	*Site Arrangement.* Use Figure 2.4-1 as is and modify title blocks as appropriate.

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VISUAL RESOURCES Figure 2

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
2	Figure 2.4-2 Palomar 2001a	*Elevation View.* Use Figure 2.4-2 as is and modify title blocks as appropriate.

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VISUAL RESOURCES Figure 3

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
3	Figure 87-1 Palomar 2002b	*Existing Lattice Towers to be Replaced or Removed.* Use as is and modify title block as appropriate.

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VISUAL RESOURCES Figure 4

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
4	Figure 73-1 Palomar 2002b	*Natural Gas Pipeline Upgrade Route.* Change photograph reference numbers as follows (including legend): change Fig. 73-2 to Fig. 5 and change Fig. 73-3 to Fig. 6. Modify title block as appropriate.

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VISUAL RESOURCES Figure 5

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
5	Figure 73-2 Palomar 2002b	*Gas Pipeline Upgrade Route: View West on Lincoln Avenue from Rock Springs Road to Metcalf Street.* Modify title block as appropriate.

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VISUAL RESOURCES Figure 6

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
6	Figure 73-3 Palomar 2002b	*Gas Pipeline Upgrade Route: View South on Metcalf Street from Lincoln Avenue to Mission Avenue.* Modify title block as appropriate.

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VISUAL RESOURCES Figure 7

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
7	Figure 77-1 Palomar 2002b	*Water Supply and Brine Return Pipeline Route.* Use Figure 77-1 and change the photograph reference numbers as follows (including legend): change Fig. 77-2 to Fig. 8; change Fig. 77-3 to Fig. 9; change Fig. 77-4 to Fig. 10; change Fig. 77-5 to Fig. 11; and change Fig. 77-6 to Fig. 12. Modify title blocks as appropriate.

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VISUAL RESOURCES Figure 8

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
8	Figure 77-2 Palomar 2002b	*Water Line Route: View West on Harmony Grove from North Side of Escondido Creek.* Modify title block as appropriate.

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VISUAL RESOURCES Figure 9

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
9	Figure 77-3 Palomar 2002b	*Water Line Route: View Southwest on Harmony Grove Road (North Side) from Enterprise/Harmony Grove Intersection.* Modify title block as appropriate.

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VISUAL RESOURCES Figure 10

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
10	Figure 77-4 Palomar 2002b	*Water Line Route: View Southwest on Harmony Grove Road (South Side) from Enterprise/Harmony Grove Intersection.* Modify title block as appropriate.

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VISUAL RESOURCES Figure 11

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
11	Figure 77-5 Palomar 2002b	*Water Line Route: View West on Harmony Grove Road (North Side.* Modify title block as appropriate.

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VISUAL RESOURCES Figure 12

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
12	Figure 77-6 Palomar 2002b	*Water Line Route: View East on Harmony Grove Road (South Side).* Modify title block as appropriate.

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VISUAL RESOURCES Figure 13

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
13	Figure 5.10-1 (Palomar 2001a) and New Base by CEC Cartography	*Location of Key Observation Points.* Transfer KOP 3, 6, and 7 location info from Fig. 5.10-1 with KOP 8 and KOP 9 locations to be provided by Gary Walker. Gary may also provide additional location information for KOPs 3, 6, and 7. Construct new title block as appropriate.

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VISUAL RESOURCES Figure 14A

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
14A	KOP 3 – Existing Condition Palomar 2002d	*KOP 3 – Existing view to the east-northeast from 1189 Oak View Way in the residential neighborhood nearest to the project site, approximately 0.3 mile west-southwest of the project site (18-inch viewing distance).*

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VISUAL RESOURCES Figure 14B

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
14B	KOP 3 After Condition Palomar 2002c	*KOP 3 – Visual simulation of the proposed project at the start of operation, as viewed from 1189 Oak View Way in the residential neighborhood nearest to the project site (18-inch viewing distance).*

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VISUAL RESOURCES Figure 15A

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
15A	KOP 6 Existing Condition Palomar 2002c	*KOP 6 – Existing view to the south from 768 Hillsboro Way at the intersection with Via Salerno, approximately 0.85 mile north of the project site (18-inch viewing distance).*

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VISUAL RESOURCES Figure 15B

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
15B	KOP 6 After Condition Palomar 2002c	*KOP 6 – Visual simulation of the proposed project at the start of operation, as viewed from 768 Hillsboro Way at the intersection with Via Salerno (18-inch viewing distance).*

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VISUAL RESOURCES Figure 16A

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
16A	KOP 7 Existing Condition Palomar 2002d	*KOP 7 – Existing view to the west from 345 Vine Street, approximately 1.4 miles east of the project site (18-inch viewing distance).*

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VISUAL RESOURCES Figure 16B

Visual Resources Figure #s	Applicant Source Figure #s	***Title* and Additional Graphic Production Guidance**
16B	KOP 7 After Condition Palomar 2002c	*KOP 7 – Visual simulation of the proposed project at the start of operation, as viewed from 345 Vine Street (18-inch viewing distance).*

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VISUAL RESOURCES Figure 17A

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
17A	KOP 8 Existing Condition Palomar 2002c	*KOP 8 – Existing view to the northwest from 1134 Pasadero Drive, approximately 0.85 mile southeast of the project site (18-inch viewing distance).*

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VISUAL RESOURCES Figure 17B

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
17B	KOP 8 After Condition Palomar 2002c	*KOP 8 – Visual simulation of the proposed project at the start of operation, as viewed from 1134 Pasadero Drive (18-inch viewing distance).*

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VISUAL RESOURCES Figure 18A

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
18A	KOP 9 Existing Condition Palomar 2002c	*KOP 9 – Existing view to the east from 919 Cycad Drive, approximately 1.5 miles west of the project site in the Coronado Hills residential area (18-inch viewing distance).*

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VISUAL RESOURCES Figure 18B

Visual Resources Figure #s	Applicant Source Figure #s	*Title* and Additional Graphic Production Guidance
18B	KOP 9 After Condition Palomar 2002c	*KOP 9 – Visual simulation of the proposed project at the start of operation, as viewed from 919 Cycad Drive in the Coronado Hills residential area (18-inch viewing distance).*

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WASTE MANAGEMENT

Alvin Greenberg, Ph.D.

INTRODUCTION

This Preliminary Staff Assessment presents an analysis of issues associated with managing wastes generated from constructing and operating the proposed Palomar Energy Project (Palomar). Staff evaluated the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation. 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) to ensure that wastes generated during the construction and operation of the proposed project are managed in an environmentally safe manner; and
- The disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6922)

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

- record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- labeling practices and use of appropriate containers,
- use of a manifest system for transportation, and
- submission of periodic reports to the U.S. Environmental Protection Agency (EPA) or authorized state agency.

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.

Title 22, California Code of Regulations, §67100.1 et seq. (Hazardous Waste Source Reduction and Management Review)

These sections establish reporting requirements for generators of certain hazardous and extremely hazardous wastes in excess of specified limits. The required reports must indicate the generator's waste management plans and performance over the reporting period.

LOCAL

The County of San Diego Department of Environmental Health is the local Certified Unified Program Authority (CUPA) administering and enforcing compliance with the California Integrated Waste Management Act for non-hazardous solid waste at the proposed power project.

SETTING

PROJECT AND SITE DESCRIPTION

The proposed Palomar Energy Project would be located on a vacant 20-acre site within a planned 165-acre industrial park in the City of Escondido, California. This parcel can be identified as located in a portion of the northwest quarter of Section 20, Township 12 South, Range 2 West, San Diego County, in a location west of Interstate 15 and south of Highway 78. The project site can be accessed from Highway 78 via Nordahl Road. Ultimately, access will be accomplished via two new paved roads connecting the site to the future Citracado Parkway.

The proposed project will be a combined-cycle electric generating facility comprised of two natural gas-fired combustion turbine generators (CTG), two heat recovery steam generators (HRSG), and a steam turbine generator (STG), along with accompanying auxiliary systems and equipment. Natural gas fuel will be supplied by an existing San Diego Gas and Electric (SDG&E) pipeline running adjacent to the project site. A proposed onsite electrical switchyard will allow connection to an existing SDG&E transmission line also running adjacent to the site. Two parallel 1.1 mile-long pipelines will be constructed to the proposed site from the City of Escondido's Hale Avenue Resource Recovery Facility (HARRF). One will supply reclaimed water to the project for process use, and the other will return the brine solution (waste water containing concentrated dissolved solids) back to the HARRF.

As proposed, the electric generating system will have a nominal generating capacity of approximately 500 megawatts (MW) at a projected equivalent availability factor of 92 to 96 percent. It will be designed for maximum operating capacity flexibility to adapt to changing demands and market conditions.

A Phase I Environmental Site Assessment (ESA) was conducted in accordance with methods prescribed by the American Society for Testing and Materials (ASTM) on the entire ERTC industrial park of which the Palomar site is a part. Section 5.13.1.3 of the AFC summarizes the conclusions of the assessment as "no recognized environmental conditions" existing at the site (Palomar 2001a). While the northern portion of the project site was used for agricultural purposes from 1958 to 1995, and probably received the application of pesticides, a Licensed Agricultural Adviser indicated that the previously applied pesticides are not persistent in the environment, making the likelihood of their continued presence extremely unlikely. However, to ensure that pesticides are not present, staff requested that limited sampling and analysis (conducted pursuant to DTSC guidelines) be conducted on the north end of the site. The results will be described in the Final Staff Assessment.

IMPACTS

PROJECT-SPECIFIC IMPACTS

Construction

Site preparation and construction of the proposed generating plant and associated facilities will generate both nonhazardous and hazardous wastes in solid and liquid forms.

Nonhazardous wastes

Nonhazardous solid wastes anticipated to be generated during construction are detailed in Section 5.13.2.1 of the AFC (Palomar 2001a) and in the Draft Waste Management Plan (Palomar 2002c). Approximately 600 tons of excess concrete, lumber, demolition debris, scrap metal, insulation, paper, wood, glass, packaging materials, and empty nonhazardous chemical containers are expected to be generated during project construction. Non-recyclable wastes would be disposed of at a Class III landfill. In addition, any soil removed during site grading which proves to be unsuitable for reuse will be disposed of in a Class III landfill.

Nonhazardous liquid wastes will be generated during construction, and are discussed in the **Soil and Water Resources** section of this document.

Hazardous wastes

Hazardous wastes anticipated to be generated during construction are discussed in Section 5.13.2.2 of the AFC and in the Draft Waste Management Plan. These wastes may include used oil, spent welding materials, waste paint, and spent solvents. Minimal quantities of hazardous wastes are anticipated during construction.

Palomar will be considered the generator of hazardous wastes at this site during the construction period. Wastes will be accumulated at satellite locations and then transported when full to the storage area located at the construction contractor's hazardous waste storage area. Storage would not exceed 90-days. The wastes accumulated would then be properly manifested, transported and disposed of by licensed hazardous waste collection and disposal companies.

Operation

The proposed Palomar project will generate both nonhazardous and hazardous wastes in solid and liquid forms under normal operating conditions.

Nonhazardous wastes

An annual total of up to 100 tons of nonhazardous solid waste, including maintenance wastes, office wastes, and oily rags is anticipated (Palomar 2001a Section 5.13.2.1; Palomar 2002c). The oily rags will be regularly laundered by an offsite industrial cleaning service. The remaining wastes will be recycled where practical. Non-recyclable wastes will be regularly transported offsite to a Class III disposal facility.

Nonhazardous liquid wastes will be generated during facility operation, and are discussed in the **Soil and Water Resources** section of this document

Hazardous wastes

Hazardous wastes anticipated to be generated during routine project operation include waste oils, oil absorbent, Selective Catalytic Reduction (SCR) catalysts, and used chemical cleaning solutions. The applicant anticipates generating approximately 1,300 gallons of waste oil per year and approximately 70,000 pounds of SCR catalyst every three to five years. The waste oil, including used crankcase and hydraulic oils and oils recovered from the oil-water separator, will be recycled by a licensed facility. The used catalyst will be returned to the manufacturer for reclamation or disposal.

The turbines and HRSGs will be periodically cleaned by a licensed contractor resulting in the production of waste wash water and chemical solutions. The waste wash water will be accumulated and stored temporarily onsite in portable tanks. The contractor will analyze the effluent for hazardous characteristics, then dispose of it appropriately offsite. The used HRSG cleaning solutions will be collected by the cleaning contractor and disposed of offsite.

Overall, the applicant anticipates that hazardous wastes will be generated in minimal quantities.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

Nonhazardous solid wastes

Section 5.13.1.1 and Table 5.13-1 of the AFC list five Class III facilities that could accept nonhazardous solid wastes from the Palomar project. The closest facility is the Ramona Landfill, located approximately 15 miles from the project site. This landfill has a remaining capacity of 690,000 cubic yards and an estimated closure date after the year 2006. In total, the five listed facilities posses a total of over 91.6 million cubic yards of remaining capacity (approximately 16,000 tons per day), and closure dates as late as 2027. In addition, the referenced section of the AFC indicates that an additional Class III landfill is in the process of being permitted. This facility would provide an additional one million tons per year capacity for solid waste for about the next 30 years. The volume (approximately 100 tons per year) of solid nonhazardous waste from the Palomar project requiring off-site disposal would be a small fraction of the existing combined capacity of the available Class III landfills and would not significantly impact the capacity or remaining life of any of these facilities.

Hazardous wastes

Section 5.13.1.2 of the AFC discusses the three Class I landfills in California: the Buttonwillow Landfill in Kern County, the Westmorland Landfill in Imperial County, and the Kettleman Hills Landfill in Kings County. The Kettleman Hills facility also accepts Class II and Class III wastes. In total, more than 20 million cubic yards of hazardous waste disposal capacity remains at these landfills, with up to 50 years of remaining operating lifetimes. The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law but not federal law.

The AFC also notes the availability of two Class I facilities outside the State of California.

The volumes of hazardous wastes generated during facility construction and operation will be minimal. Approximately 165 gallons per month of paints and used oils are expected to be generated during construction. Approximately 1,300 gallons (five tons) of used oil per year and 70,000 pounds of spent catalyst every three to five years are expected to be generated during operation. All hazardous wastes would be transported offsite to a permitted TSD facility for appropriate disposition. The volume of hazardous waste from Palomar requiring off-site disposal would be a very small fraction of the existing combined capacity of the three Class I landfills, and would not significantly impact the capacity or remaining life of any of these facilities.

CUMULATIVE IMPACTS

As proposed, the quantities of nonhazardous and hazardous wastes generated during construction and operation of the Palomar project will add to the total quantities of waste generated in San Diego County and the State of California. This facility will generate an estimated 600 tons of solid waste during construction and approximately 100 tons per year during operation. Additionally, it will produce approximately 1,300 gallons of waste oil each year and approximately 70,000 pounds of SCR catalyst every three to five years.

In section 5.13.5 of the AFC, the Applicant recognized two other nearby generating stations, now operating, as well as the construction activities in the industrial park surrounding Palomar, in an analysis of cumulative waste impacts. The two small generating stations are now operational, so there would be no cumulative construction waste impacts with these facilities. Even in combination, the two small power plants, the additional construction activities in the surrounding portions of the industrial park, and the Palomar project are not estimated to produce more than 10,000 tons of solid waste per year. Due to the minor amounts of wastes generated during project construction and operation, the insignificant impacts on individual disposal facilities, and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes. Consequently, no significant cumulative waste management impacts are anticipated from the Palomar project.

FACILITY CLOSURE

Facility closure is addressed in section 2.10 of the AFC (Palomar 2001a). 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 the Conditions of Certification proposed in the **General Conditions** section will adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally required by LORS and already in place (such as limiting hazardous waste accumulation

time to 90 days and requiring proper containment) would be adequate to avoid significant problems. In addition, staff's **General Conditions for Facility Closure** requires preparation of an on-site contingency plan, which 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, Palomar will develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Energy Commission staff concludes that the Palomar Energy Project will comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during facility construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the various departments within the Cal EPA. Because hazardous wastes will be produced during project construction and operation, Palomar will be required to obtain a hazardous waste generator identification number from the DTSC. Accordingly, Palomar will be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, keep detailed records, and appropriately train their employees. Pursuant to California Code of Regulations, Title 22, section 67100.1 et seq., a hazardous waste Source Reduction and Evaluation Review and Plan must be prepared by Palomar that meets the requirements of SB-14.

MITIGATION

In section 5.13.3 of the AFC and in the Draft Waste Management Plan, Palomar discusses the mitigation measures it plans to employ at the proposed project (Palomar 2001a; Palomar 2002c). The generation of nonhazardous solid wastes will be kept minimal and either recycled or disposed of in a Class III landfill. Nonhazardous liquid wastes will be minimized through management practices.

In the referenced section of the AFC, Palomar commits to the implementation of six mitigation measures to minimize the impacts of the facility's generation of hazardous wastes. Those measures are summarized below.

1. Obtain a hazardous waste generator identification number from DTSC (also required by Condition of Certification **WASTE-1**)
2. Hazardous waste storage measures including limited 90-day storage on site, storage within a secondary containment area sized to hold the volume of the tank plus 10

percent to account for precipitation. All hazardous waste accumulation areas will be visually inspected and maintained on a weekly basis.

3. Hazardous waste transportation measures including the use of licensed haulers and documentation using hazardous waste manifests.
4. Hazardous waste spill control and management procedures identified in a site spill contingency plan to be developed prior to commercial operation.
5. Facility employee emergency response training including training in hazardous waste procedures and spill contingencies.
6. Hazardous waste generation minimization procedures and training.

Staff has examined the waste management related measures proposed by the Applicant and concludes that, together with applicable LORS and the Conditions of Certification proposed by staff, they will adequately insure that no significant adverse environmental impacts will result from the management and disposal of project-related waste.

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of the Palomar Energy Project will not result in any significant adverse impacts if the waste management measures proposed in the Application for Certification and the proposed Conditions of Certification are implemented.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner and, if necessary, its construction contractor, shall each 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 notify the CPM via the monthly compliance report of its receipt and keep a copy of the identification number on file at the project site.

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

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-3 Prior to the start of both site mobilization and project operation, the project owner shall prepare and submit to the San Diego County Department of Environmental Health for review and comment and to the CPM for review and approval, 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 waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including storage, treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 30 days prior to the start of site mobilization, the project owner shall submit the construction waste management plan to the San Diego County Department of Environmental Health and the CPM. The operation waste management plan shall be submitted no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 The project owner shall have a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies, available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist to the CPM for approval.

WASTE-5 If potentially contaminated soil (as evidenced by discoloration, odor, detection by handheld instruments, or other signs) is unearthed during excavation at either the proposed site or linear facilities, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the San Diego County Department of

Environmental Health and the San Diego Office of DTSC for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM within five days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

REFERENCES

Palomar Energy, LLC, San Diego, California (Palomar) 2001a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 28, 2001.

Palomar Energy, LLC, San Diego, California (Palomar) 2002a. Volume III: Data Responses. Submitted to the California Energy Commission on February 5, 2002.

Palomar Energy, LLC, San Diego, California (Palomar) 2002b. Applicant's Supplemental Responses to CEC Staff Data Requests. Submitted to the California Energy Commission on May 8, 2002.

Palomar Energy, LLC, San Diego, California (Palomar) 2002c. Responses to CEC Staff's Data Requests 1-117. Submitted to the California Energy Commission on April 8, 2002.

WORKER SAFETY AND FIRE PROTECTION

Alvin J. Greenberg, Ph.D. and Rick Tyler

INTRODUCTION

Worker safety and fire protection is regulated through laws, ordinances, regulations, and standards (LORS), at the federal, State, and local levels. Industrial workers at the facility operate process equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to eliminate these hazards or to minimize the risk through special training, protective equipment and procedural controls.

The purpose of this Staff Assessment is to assess the worker safety and fire protection measures proposed by the Palomar Energy Project and to determine whether the applicant has proposed adequate measures to:

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

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970. This Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, sections 651 through 678). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards sections 1910.1 to 1910.1500 which clearly define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the general industry safety and health standards now in force under this act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA), which publishes the National Fire Codes.

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

Applicable Federal requirements include:

- 29 U.S. Code section 651 et seq. (Occupational Safety and Health Act of 1970);
- 29 CFR sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations);
- 29 CFR sections 1952.170 to 1952.175 (Federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR §1910.1 to 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 sections 337 to 560 and continuing with sections 1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)) and thus all Cal/OSHA health and safety standards meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at 29 CFR sections 1910.1 to 1910.1500. The Federal Secretary of Labor, however, continually oversees California's program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

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

Employers are responsible for informing their employees about workplace hazards, potential exposure and the work environment (Labor Code § 6408). Cal/OSHA's principal tool in ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 (8 CCR §5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the Federal Hazard Communication Standard (29 CFR §1910.1200), which established on the federal level an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, 8 CCR §3203 requires that employers establish and maintain a written Injury and Illness Prevent Program to identify workplace hazards and communicate them to its employees through a formal employee-training program.

Applicable State requirements include:

- 8 CCR §339 (List of hazardous chemicals relating to the Hazardous Substance Information and Training Act);
- 8 CCR §337, et seq. (Cal/OSHA regulations);
- 24 CCR § 3, et seq. (incorporates the current addition 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); and
- Health and Safety Code § 25500 to 25541 (Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility).

LOCAL

The California Building Standards Code, published at Title 24 of the California Code of Regulations section 3, et seq., is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The Building Standards Code includes the electrical, mechanical, energy, and fire codes applicable to the project. Local planning/building & safety departments enforce the California Uniform Building Code.

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

Similarly, the Uniform Fire Code (UFC) Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and the NFPA. It is the United State's premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition. The City of Escondido adopted the 1997 Uniform Fire Code, with California amendments. The City of Escondido Fire Department administers the UFC.

Applicable local (or locally enforced) requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9);
- California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.); and
- Uniform Fire Code, 1997.

SETTING

The proposed project is located in the City of Escondido in San Diego County.

The Palomar Energy Project involves construction and operation of a combined cycle natural gas fired cogeneration facility with ancillary facilities including reclaimed water supply and brine return pipelines.

Fire support services to the site will be under the jurisdiction of the City of Escondido Fire Department (EFD). Fire Station No. 1 is the closest station to the site and is located at 310 North Quince Street, approximately 3.5 miles from the project site. The response time to the project site is estimated to be less than 6 minutes. Station 5 is located at 2319 Felicita, approximately 5.5 miles from the project site; and would be the second responder with an estimated response time of less than 10 minutes (EFD 2002). In conversations with the Escondido Fire Department (EFD 2002), staff determined that Fire Station No. 1 is adequately equipped and manned. Staff further determined that the response time is adequate and consistent with the UFC and the NFPA.

The Escondido fire stations are considered first responders for HazMat incidents, with backup service provided by the San Diego County HazMat Response Team (EFD 2002). Staff finds that the hazardous materials response time is excellent and that the County HazMat Response Team is adequately trained and equipped to respond in a timely manner (San Diego County 2002).

IMPACTS

WORKER SAFETY

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the Palomar Energy Project to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

FIRE HAZARDS

During construction and operation of the proposed Palomar Energy Project there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS will be adequate to assure protection from all fire hazards.

APPLICANT'S PROPOSED MITIGATION

WORKER SAFETY

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that will be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

Construction Safety and Health Program

The Palomar Energy Project encompasses construction and operation of a natural gas fired facility with ancillary facilities such as transmission lines and pipelines. Workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at 8 CCR § 1502, et seq. These requirements are promulgated by Cal/OSHA and are applicable to the construction 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); and
- Personal Protective Equipment Program (8 CCR §§ 1514 - 1522).

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

- Electrical Safety Program;
- Unfired Pressure Vessel Safety Orders;
- Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;
- Fall Prevention Program;
- Scaffolding/Ladder Safety Program;
- Articulating Boom Platforms Program;
- Crane and Material Handling Program;
- Housekeeping and Material Handling and Storage Program;
- Hot Work Safety Program;
- Respiratory Protection Program;
- Employee Exposure Monitoring Program;
- Confined Space Entry Program;

- Hand and Portable Power Tool Safety Program;
- Hearing Conservation Program;
- Back Injury Prevention Program;
- Hazard Communication Program;
- Air Monitoring Program;
- Heat and Cold Stress Monitoring and Control Program; and
- Pressure Vessel and Pipeline Safety Program.

The AFC includes adequate outlines of each of the above programs. Prior to the start of construction of the Palomar Energy Project, detailed programs and plans will be provided pursuant to the Condition of Certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Prior to the start of operations at the Palomar Energy Project, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203);
- Emergency Action Plan (8 CCR § 3220);
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

In addition, the requirements under General Industry Safety Orders (8 CCR §§ 3200 - 6184), Electrical Safety Orders (8 CCR §§2299 - 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 - 544) will be applicable to the project. Written safety programs for the Palomar Energy Project, which the applicant will develop, will ensure compliance with the above-mentioned requirements.

The AFC includes an adequate outline of the Emergency Action Plan (AFC p. 5.14-5). Prior to operation of the Palomar Energy Project, all detailed programs and plans will be provided pursuant to Condition of Certification **WORKER SAFETY-2**.

Safety and Health Program Elements

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

Injury and Illness Prevention Program (IIPP)

The Applicant will submit expanded Construction and Operations Illness and Injury Prevention Programs to Cal/OSHA for review and comment 30 days prior to construction and operation of the project, respectively.

The IIPP will include the following components as presented in the AFC:

- Identity of person(s) with authority and responsibility for implementing the program;
- System ensuring employees comply with safe and healthy work practices;
- System facilitating employer-employee communications;
- Procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Methods of documenting inspections and training and for maintaining records; and
- A training program for introducing the program to new, transferred, or promoted employees, and for new processes and equipment; including supervisors; and contractors.

Emergency Action Plan

California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (page 5.14-5).

The outline lists the following features:

- Purpose and Scope of the Emergency Action Plan;
- Personnel Responsibilities during Emergencies;
- Specific Response Procedures;
- Evacuation Plan;
- Emergency Equipment Locations;
- Fire Extinguisher Locations;
- Site Security;
- Accident Reporting and Investigation;
- Lockout/Tagout;
- Hazard Communication;
- Spill Containment and Reporting;
- First Aid and Medical Response;
- Respiratory Protection;
- Personal Protective Equipment;
- Sanitation; and
- Work Site Inspections.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The AFC describes a proposed fire prevention plan which is acceptable to staff. The plan will include the following topics:

- Responsibilities;
- Procedures for fire control;
- Fixed and Portable fire-fighting equipment;
- Housekeeping;
- Employee alarm/communication practices;
- Servicing and refueling areas;
- Training; and
- Flammable and combustible liquid storage.

Staff proposes that the Applicant submit a final Fire Protection and Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) for review and approval and to the City of Escondido Fire Department for review and comment to satisfy proposed Conditions of Certification **WORKER SAFETY 1** and **2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are present that, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (8 CCR § 3380-3400). The Palomar Energy Project operational environment will require PPE.

Information provided in the AFC indicates that all employees required to use PPE will be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment will meet National Institute of Safety and Health (NIOSH) or ANSI standards and will carry markings, numbers, or certificates of approval. Respirators will meet NIOSH and Cal/OSHA standards. Each employee will be provided with the following information pertaining to the protective clothing and equipment:

- Proper use, maintenance, and storage;
- When the protective clothing and equipment are to be used;
- Benefits and limitations; and
- When and how the protective clothing and equipment are to be replaced.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provides employees with the information and training necessary to protect them from potential workplace hazards.

Written Safety Program

In addition to the specific plans listed above, additional LORS apply to the project, called "safe work practices." Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs include the following:

- Fall Protection Program;
- Hot Work Safety Program;
- Confined Space Entry Program;
- Hearing Conservation Program;
- Hazard Communication Program;
- Process Safety Management (PSM) Program; and
- Contractor Safety Program.

Safety Training Programs

Employees will be trained in the safe work practices described in the above-reference safety programs.

FIRE PROTECTION

Staff reviewed the information provided in the AFC to determine if available fire protection services and equipment would adequately protect workers, and to determine the project's impact on fire protection services in the area (Palomar 2001a, Section 2.4.10). The project will rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, would be provided by the City of Escondido Fire Department.

During construction an interim fire protection system will be in place. The permanent facility fire protection system will be placed in service as early as possible during the construction phase.

The information in the AFC indicates that the project intends to meet the fire protection and suppression requirements. Elements include both fixed and portable fire extinguishing systems. The fire water supply consists of a dedicated 200,000-gallon portion of reclaimed water from the 730,000-gallon raw water/firewater storage tank located on-site. The reclaimed water will be supplied from the City of Escondido's Hale Avenue Resource Recovery Facility (HARRF). The firewater pumping system consists of two electric motor-driven fire pumps, each with a capacity of 500 gallons/minute to deliver water to the fire protection water piping network. A small capacity electric motor jockey pump maintains pressure in the piping network. Staff finds that this system will provide more than an adequate quantity of fire-fighting water to yard hydrants, hose stations, and water spray and sprinkler systems.

A carbon dioxide fire protection system will be provided for the combustion turbine generator and accessory equipment. Fire detection sensors will also be installed.

Fire hydrants and portable fire extinguishers will be located throughout the power plant site at appropriate intervals according to code.

In addition to the fixed fire protection system, smoke detectors, combustible gas detectors, and appropriate class of service portable extinguishers will be located throughout the facility at code-approved intervals. These systems are standard requirement by the NFPA and the UFC and staff finds that they will ensure adequate fire protection.

The applicant will be required to provide the final Fire Protection and Prevention Program to staff and to the City of Escondido Fire Department, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

CUMULATIVE IMPACTS

Staff reviewed the potential for the construction and operation of Palomar Energy Project, combined with existing industrial facilities, and expected new facilities, to result in impacts on the fire and emergency service capabilities of the City of Escondido Fire Department and found that cumulative impacts were insignificant. The City's fire department stated that they feel adequately staffed and equipped to deal with any incident at the proposed facility (EFD 2002). Given the industrial area where the project is proposed to be built, and the lack of unique fire hazards associated with a modern gas-fired power plant, staff finds that this project will not have any significant incremental burden on the department's ability to respond to a fire or medical emergency.

The Palomar Energy Project would be located on Planning Area 1 of the proposed Escondido Research and Technology Center (ERTC) project. The ERTC project and a draft Specific Plan for the ERTC are currently undergoing land use permitting and California Environmental Quality Act (CEQA) reviews, with the City of Escondido (City) as Lead Agency. The City released a draft Environmental Impact Report (EIR) on July 26, 2002. Staff is reviewing this draft EIR and will evaluate the potential cumulative impacts from this project in the Final Staff Assessment.

FACILITY CLOSURE

The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also maintain compliance with all applicable health and safety LORS during that time. A facility closure plan will be developed prior to closure to incorporate these requirements.

CONCLUSION AND RECOMMENDATIONS

If the Applicant for the proposed Palomar Energy Project provides a Project Construction Safety and Health Program and a Project Operations Safety and Health Program, as required by Conditions of Certification **WORKER SAFETY 1** and **-2**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, and to comply with applicable LORS. Staff also concludes that the proposed project will not have significant impacts on local fire protection services. The proposed facility would be located within an industrial area that is currently served by the local fire department. The fire risks of the proposed facility do not pose significant

added demands on local fire protection services. Staff also finds that the San Diego County Hazardous Materials Division is adequately equipped and staffed to respond to more serious hazardous materials accidents at the proposed facility with an adequate response time.

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

PROPOSED CONDITIONS OF CERTIFICATION

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

- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- A Construction Emergency Action Plan; and
- A Construction Fire Protection and Prevention Plan.

The Safety Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the City of Escondido Fire Department for review and comment prior to submittal to the CPM.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a letter from the City of Escondido Fire Department stating that they have reviewed and commented on the Construction Fire Protection and Prevention Plan and Emergency Action Plan.

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

- An Operation Injury and Illness Prevention Plan;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;

- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

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

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety & Health Program.

REFERENCES

California Fire Code 1998. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, Ca.

Escondido Fire Department (EFD). 2002. Personal communications with Lamont Landis, Fire Marshal. February 13 and May 23, 2002.

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Palomar Energy, LLC, San Diego, California (Palomar) 2001a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 28, 2001.

San Diego County 2002. Personal communication with Mr. Mike Handman, San Diego County Environmental Health Services Department, Hazardous Materials Division. June 10.

Uniform Fire Code 1997, Vol. 1. Published by the International Fire Code Institute comprised of the International Conference of Building Officials and the Western Fire Chiefs Association, Whittier, Ca.

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.

FACILITY DESIGN

Shahab Khoshmashrab, Al McCuen and Steve Baker

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the engineering LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written decision ….which includes…(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited and operated in order to protect environmental quality and assure public health and safety…[and] (d)(1) Findings regarding the conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state and federal standards, ordinances, or laws…" (Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects discussed in this analysis include:

- Identification of the engineering LORS applicable to facility design;
- Evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

SETTING

Palomar Energy proposes to construct and operate a nominally rated 500 megawatt combined cycle power plant known as Palomar Energy Project (PEP). The site would occupy approximately 20 acres located in the City of Escondido, San Diego County and would lie in seismic zone 4. For more information on the site and related project description, please see the **Project Description** section of this document. References to "the City" and "the County" designate the City of Escondido and San Diego County, respectively. Additional engineering design details are contained in the Application for Certification (AFC), in Appendix D (Palomar 2001a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (Palomar 2001a, Appendix D). Some of these LORS include California Building Code (CBC), and standards published by American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM) and American Welding Society (AWS).

ANALYSIS

The basis of this analysis is the applicant's proposed analysis, construction methods, list of engineering LORS and design criteria set forth in the AFC.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline. The applicant proposes to use accepted industry standards (see AFC Appendix D for a representative list of applicable industry standards), design practices and construction methods in preparing and developing the site (Palomar 2001a). Staff concludes that the project, including its linear facilities, will comply with all applicable site preparation LORS, and proposes Conditions of Certification (see 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, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects public health and safety.

The project shall be designed and constructed to the 1998 edition of the California Building Code (CBC) and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included proposed Condition of Certification **STRUC-1** (below), which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

PROJECT QUALITY PROCEDURES

The AFC (Palomar 2001a, § 4.3.2) describes a Project Quality Program that will be used on the project to ensure that systems and components will be designed, fabricated, stored, transported, installed and tested in accordance with the technical codes and standards appropriate for a power plant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that the project is actually designed, procured, fabricated and installed as contemplated in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and to ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, either the City or the County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed Conditions of Certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations and specifications submitted to the CBO. These conditions require that no element of construction subject to CBO review and approval shall proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant bears the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure plan.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The engineering LORS identified in the AFC and supporting documents are those applicable to the project.

2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project will comply with applicable engineering LORS.

3. The Conditions of Certification proposed will ensure that the facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking and field inspections performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.

4. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that, if the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;

2. The project be designed and built to the 1998 CBC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and

3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC) and all other applicable engineering LORS in effect at the time initial design plans are

submitted to the CBO for review and approval. (The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.) All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy].

GEN-2 Prior to submittal of the initial engineering designs for CBO review, the project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in Table 1 below. Major structures and equipment shall be added to or deleted from the Table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Combustion Turbine (CT) Foundation and Connections	2
Combustion Turbine Generator Foundation and Connections	2
Steam Turbine (ST) Foundation and Connections	1
Steam Turbine Generator Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
HRSG Stack Foundation and Connections	2
CT Main Transformer Foundation and Connections	2
ST Main Transformer Foundation and Connections	1
CT Air Inlet Filter Foundation and Connections	2
Cooling Tower Structure, Foundation and Connections	1
Raw Water Storage Tank Structure, Foundations and Connections	1
Demineralized Water Storage Tank Structure, Foundation and Connections	1
RO Water Tank Structure, Foundation and Connections	1
Administration Building Structure, Foundation and Connections	1
Gas Compressor Building Structure, Foundation and Connections	1
Ammonia Storage Tank Foundation and Connections	1
Gas Metering Station Structure, Foundation and Connections	1
Switchyard Control Building Structure, Foundation and Connections	1
Water Treatment/Cooling Tower Chemicals/Electrical Equipment Building Structure, Foundation and Connections	1
Chemical Treatment Building Structure, Foundation and Connections	1
Electrical Control Room Building Structure, Foundation and Connections	1
Maintenance/Warehouse Building Structure, Foundation and Connections	1
Compressor Water Wash Skid Foundation and Connections	1
Ammonia Spill Impounding Area	1
Condensate Pumps Foundation and Connections	2
HRSG Boiler Feed-water Pumps Foundation and Connections	4
Circulating Water Pumps Foundation and Connections	2
Closed Cooling Water Pumps Foundation and Connections	2
Auxiliary Circulating Water Pumps Foundation and Connections	2
Closed Cooling Water Heat Exchangers Foundation and Connections	2
Gas Scrubber/Drains Tank Foundation and Connections	2
Air Compressor Skid Foundation and Connections	2
Water Wash Drains Tank Foundation and Connections	2
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot

Equipment/System	Quantity (Plant)
High Pressure and Large Diameter Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Substation/Switchyard, Buses and Towers	1 Lot
Electrical Duct Banks	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 1998 CBC [Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities)]. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

1. Monitor construction progress of work requiring CBO design review and inspection to ensure compliance with LORS;

2. Ensure that construction of all the facilities subject to CBO design review and inspection conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;

3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;

4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and

6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a soils engineer, or a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;

and C) an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: D) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; E) a mechanical engineer; and F) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [1998 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A: The civil engineer shall:

1. Review the Foundation Investigations Report, Geotechnical Report or Soils Report prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;
2. Design, or be responsible for design, stamp, and sign all plans, calculations and specifications for proposed site work, civil works and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and
3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B: The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports;

2. Prepare the Foundation Investigations Report, Geotechnical Report or Soils Report containing field exploration reports, laboratory tests and engineering analysis detailing the nature and extent of the soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load [1998 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations];

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33; Section 3317, Grading Inspections; (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both, as set forth in the1998 CBC, Appendix Chapter 33; Section 3317.1, General); and

4. Recommend field changes to the civil engineer and RE.

   This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations [1998 CBC, section 104.2.4, Stop orders].

C: The engineering geologist shall:

1. Review all the engineering geology reports and prepare final soils grading report; and

2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33; Section 3317, Grading Inspections; (depending on the site conditions, this may be the responsibility of either the soils engineer or engineering geologist or both, as set forth in the1998 CBC, Appendix Chapter 33; Section 3317.1, General).

D: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;

2. Provide consultation to the RE during design and construction of the project;

3. Monitor construction progress to ensure compliance with engineering LORS;

4. Evaluate and recommend necessary changes in design; and

5. Prepare and sign all major building plans, specifications and calculations.

E: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

F: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who

shall be responsible for the special inspections required by the 1998 CBC, Chapter 17 [Section 1701, Special Inspections; Section 1701.5, Type of Work (requiring special inspection)]; and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. Observe the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action [1998 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]; and

4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective

action required [1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections]. The project owner shall retain one set of approved engineering plans, specifications and calculations at the project site or at another accessible location during the operating life of the project [1998 CBC, Section 106.4.2, Retention of Plans].

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM in the next Monthly Compliance Report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;

2. An erosion and sedimentation control plan;

3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and

4. Soils report, Geotechnical Report or Foundation Investigations Report required by the 1998 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report; Section 3309.6, Engineering Geology Report; and Chapter 18, Section 1804, Foundation Investigations].

Verification: At least 15 days (or project owner and CBO approved alternative timeframe) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer or geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area [1998 CBC, Section 104.2.4, Stop orders].

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations for which a grading permit is required shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO and the CPM [1998 CBC, Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of

the final “as-graded” grading plans and final “as-built” plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy].

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer’s signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Table 1** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 1**, above):

1. Major project structures;

2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;

4. Turbine/generator pedestal; and

5. Switchyard structures.

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;

2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations and specifications [1998 CBC, Section 108.4, Approval Required];

3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations and other required documents of the designated major structures at least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans; and Section 106.3.2, Submittal documents]; and

4. Ensure that the final plans, calculations and specifications clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of construction of any structure or component listed in Table 1 of Condition of Certification **GEN-2** above, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the non-conforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications and calculations have been approved and are in conformance with the requirements set forth in the applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

2. Concrete pour sign-off sheets;

3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and

5. Reports covering other structural activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special Inspections; Section 1701.5, Type of Work (requiring special inspection); Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM [1998 CBC, Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector]. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with the requirements of that Chapter.

Verification: At least 30 days (or project owner and CBO approved alternate timeframe) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in Table 1, Condition of Certification **GEN 2**, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal Documents; Section 108.3, Inspection Requests; Section 108.4, Approval Required; 1998 California Plumbing Code, Section 103.5.4, Inspection Request; Section 301.1.1, Approval].

The responsible mechanical engineer shall stamp and sign all plans,drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- Specific City/County code.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [1998 CBC, Section 104.2.2, Deputies].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of any increment of major piping or plumbing construction listed in Table 1, Condition of Certification **GEN-2** above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the

responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3, Inspection Requests].

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and

2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the

project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 1998, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and

2. system grounding drawings.

B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;

2. ampacity of feeder cables;

3. voltage drop in feeder cables;

4. system grounding requirements;

5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;

6. system grounding requirements; and

7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the Monthly Compliance Report:

1. Receipt or delay of major electrical equipment;

2. Testing or energization of major electrical equipment; and

3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

Verification: At least 30 days (or project owner and CBO approved alternative timeframe) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

Palomar Energy, LLC, San Diego, California (Palomar) 2001a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 28, 2001.

GEOLOGY, MINERAL RESOURCES, AND PALEONTOLOGY

Dal Hunter, Ph.D., C.E.G.

INTRODUCTION

In the geology, mineral resources, and paleontology section, staff discusses potential impacts of the proposed Palomar Energy Project (PEP) regarding geologic hazards, geologic (including mineralogic) resources, and paleontologic resources. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to important geologic and paleontologic resources during project construction, operation and closure. A brief geologic and paleontologic overview of the project is provided. The section concludes with staff's proposed monitoring and mitigation measures with respect to geologic hazards and geologic, mineralogic, and paleontologic resources. Relevant conditions of certification are included in the Facility Design section of this Preliminary Staff Assessment (PSA).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS are listed in the Application for Certification (AFC) (Palomar Energy, 2001a Section 6.4.5). The following is a brief description of the LORS for geologic hazards and resources, and for paleontologic resources.

FEDERAL

There are no federal LORS for geologic hazards and resources or grading for the proposed project. The Federal Antiquities Act of 1906, in part, protects paleontologic resources from vandalism and unauthorized collection on federal land (L 59-209; 16 United States Code 431 *et seq.*; 34 Stat. 25). The National Environmental Policy Act of 1968 as amended, requires analysis of potential environmental impacts to important historic, cultural, and natural aspects of our national heritage (United States Code, Section 4321 4327; 40 Code of Federal Regulations, Section 1502.25).

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 (CBSC, 1998). 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). The CBC supplements the UBC's grading and construction ordinances and regulations.

The California Environmental Quality Act Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

- Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geologic hazards.

- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The "Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures" (SVP, 1995) is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1995 by the Society of Vertebrate Paleontologists (SVP), a national organization.

SETTING

The proposed PEP site is located with the Peninsular Ranges geomorphic province north of San Diego, California. This area within the Peninsular Ranges is characterized by gently rolling foothills and narrow valleys. Major geologic units in the vicinity of the site include the Cretaceous Green Valley Tonalite and miscellaneous Cretaceous granodiorites, gabbro, and undifferentiated sedimentary materials. The Cretaceous Green Valley Tonalite consists of granitic intrusions that may be deeply weathered. The miscellaneous Cretaceous granodiorites and gabbro consist of a complex series of igneous intrusions and the Cretaceous sedimentary materials consist of colluvium derived from in-place weathering and alluvium derived from local streams (Larson, 1948).

Exploration at the plant site by the applicant's geotechnical consultant, generally encountered a variable, surficial, brown to red brown topsoil or colluvium overlying the Green Valley Tonalite or San Marcos Gabbro (GEOCON Inc., 1999). The surficial topsoil and colluvium was encountered from the ground surface to depths of 9.5 feet. Bedrock consisting of the Green Valley Tonalite or San Marcos Gabbro was encountered below the surficial topsoil or colluvium. The surficial topsoil generally classified as a silty to clayey sand. The surficial colluvium generally classified as a silty to clayey sand and sandy clay. The Green Valley Tonalite classified as a silty sand. Ground water was not encountered during trenching at the plant site.

Geologic mapping shows that the proposed water supply and brine return pipeline alignment passes through the Green Valley Tonalite, and the proposed natural gas pipeline upgrade linear passes through undifferentiated Quaternary sedimentary rocks (Larson,1948).

IMPACTS

Two types of impacts considered in this section. The first are geologic hazards that could impact proper functioning of the proposed facility and include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, and tsunamis and seiches. The second are the potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

STAFF'S CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

There are no federal LORS with respect to geologic hazards and geologic and mineralogic resources; however, the CBC provides geotechnical and geological investigation and design guidelines which engineers must adhere to when designing a proposed facility. As a result, the criteria used to assess geologic hazard impact significance includes evaluating each potential hazard in relation to being able to adequately design and construct the proposed facility.

With respect to impacts the proposed facility may have on existing geologic and mineralogic resources, geologic and mineral resource maps for the surrounding area are reviewed in addition to any site-specific information provided by the applicant, to determine if geologic and mineralogic resources are present in the area. If available, operating procedures of the proposed facility, in particular ground water extraction and mass grading operations are reviewed to determine if such operations could adversely impact such resources**.**

The Federal Antiquities Act of 1906 (PL 59-209; 16 United States Code 431 *et seq*.; 34 Stat. 25), in part, protects paleontologic resources from vandalism and unauthorized collection on federal land. The National Environmental Policy Act of 1968 (United States Code, Section 4321 4327; 40 Code of Federal Regulations, Section 1502.25), as amended, requires analysis of potential environmental impacts to important historic, cultural and natural aspects of our national heritage. Based on these policies, staff reviews existing paleontologic information for the surrounding area, as well as any site-specific information provided by the applicant, in accordance with accepted assessment protocol (SVP, 1995) to determine if there are any known paleontologic resources in the general area. If paleontological resources are present or likely to exist, staff recommends conditions of certification that outline procedures required during construction to mitigate any potential impacts

GEOLOGIC HAZARDS

Faulting and Seismicity

Energy Commission staff reviewed the California Division of Mines and Geology (CDMG) publication *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions*, dated 1994 (CDMG, 1994); the *Geologic Map of California – Santa Ana Sheet* (*Rogers, 1965*); *Maps of Known Active Fault Near-Source Zones in California and Adjacent Parts of Nevada* (International Conference of Building Officials [ICBO], 1998); and *Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act* (Hart and Bryant, 1999). The project is located within Seismic Zone 4, as delineated on Figure 16-2 of the CBC. The closest known Holocene (active) fault is the Rose Canyon Fault, located approximately 15.5 miles east of the plant site. Staff calculated an estimated deterministic peak ground acceleration for the plant site in the range of 0.17g. A second active fault, the Elsinore-Julian Fault, is located approximately 17.75 miles northwest of the plant site. Staff calculated an estimated deterministic peak ground acceleration for the plant site in the range of 0.17g. A third active fault, the Newport-Inglewood Fault, is located approximately 18.5 miles east of the plant site. Staff calculated an estimated deterministic peak ground

acceleration for the plant site in the range of 0.15g. The project linear facilities can be expected to experience peak ground accelerations within this same range.

Liquefaction

Liquefaction is a nearly complete loss of soil shear strength that can occur during a seismic event. During the seismic event, cyclic shear stresses cause the development of excessive pore water pressure between the soil grains, effectively reducing the internal strength of the soil. This phenomenon is generally limited to unconsolidated, clean to silty sand (up to 35 percent non-plastic fines) and very soft silts lying below the ground water table. The higher the ground acceleration caused by a seismic event, the more likely liquefaction is to occur. Severe liquefaction can result in catastrophic settlements of overlying structural improvements and lateral spreading of the liquefied layer when confined vertically but not horizontally.

Because the plant site is underlain by shallow bedrock and ground water was not encountered to the maximum depth of geotechnical exploration the potential for liquefaction is insignificant (GEOCON, Inc., 1999). Since detailed subsurface information was not included in the AFC along the proposed water supply, brine return, and natural gas (upgrade) pipeline linears, the potential for liquefaction along these linear facilities is unknown. However, given the shallow bedrock mapped in the area, the potential for liquefaction is considered negligible.

Dynamic Compaction

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements. The plant site is generally underlain by surficial, granular silty sands overlying native bedrock at shallow depth. Since the preliminary geotechnical investigation recommends the overexcavation of the materials below areas of planned grading, the potential for dynamic compaction at the plant site is considered very low (GEOCON, Inc., 1999). Because detailed subsurface information was not included in the AFC along the proposed water supply, brine return, and natural gas (upgrade) pipeline linears, the potential for dynamic compaction along these linear facilities is unknown; however, given the shallow bedrock present in the area, the potential for dynamic compaction is negligible.

Hydrocollapse

Partially saturated soils can possess bonds that are a result of chemical precipitates that accumulate under semi-arid conditions. Such soluble compound bonds provide the soils with cohesion and rigidity. These bonds can be destroyed, however, upon prolonged submergence. When destroyed, a substantial decrease in the material's void ratio is experienced even though the vertical pressure does not change. Materials that exhibit this decrease in void ratio and corresponding decrease in volume with the addition of water are defined as collapsible soils. Collapsible soils are typically limited to true loess, flash flood deposits, and windblown silts. Because the plant site is generally underlain by silty sand and clayey sand soils overlying native bedrock at shallow depths, the potential for hydrocollapse at the plant site is considered low. No subsurface information along the proposed linear alignments was provided in the AFC

(Palomar Energy, 2001a). Because of the granular nature of the soils, their mode of deposition, and shallow bedrock present in the area, the potential for hydrocollapse is considered negligible.

Subsidence

Ground subsidence is typically caused when ground water is drawn down by irrigation activities such that the effective unit weight of the soil mass is increased, which in turn increases the effective stress on underlying soils, resulting in consolidation/settlement of the underlying soils. Since the PEP will obtain reclaimed water from the City of Escondido's Hale Avenue Resource Recovery Facility (HARRF), significant draw down of the water table due to PEP operations is not anticipated. As a result, the potential for ground subsidence is considered negligible, especially since this is a bedrock site.

Expansive Soils

Soil expansion occurs when clay-rich soils, with an affinity for water, exist in-place at a moisture content below their plastic limit. The addition of moisture from irrigation, capillary tension, water line breaks, etc. causes the clay soils to collect water molecules in their structure, which, in turn, causes an increase in the overall volume of the soil. This increase in volume can correspond to movement of overlying structural improvements. As reported in the preliminary geotechnical report, surficial materials in the project area include silty to clayey sand soils. As a result, the potential hazard from expansive soils is low (GEOCON, Inc., 1999). Detailed subsurface information was not included in the AFC along the linear facilities; however, geologic mapping and the soils description in the AFC suggest that expansive clays would not be expected. Expansive clays are not normally a hazard to linear facilities.

Landslides

Landslides typically involve rotational slump failures within surficial soils/colluvium and/or weakened bedrock that are usually implemented by an increase of the material's moisture content above a layer which exhibits a relatively low strength. Debris-flows are shallow landslides that travel downslope very rapidly as muddy slurry. Shallow infinite-slope type landslides are common in the Peninsular Ranges. The plant site area has been mapped by Tan and Giffen (1995) as generally susceptible to landslides. The proposed water supply and brine return pipeline linears have been mapped as marginally to generally susceptible, and the natural gas pipeline linear has been mapped as marginally susceptible. The potential for landslides at the plant site and linear facilities is very low, given the site's surficial soils overlying shallow bedrock and the low slope angles present.

Tsunamis and Seiches

Tsunamis and seiches are earthquake-induced waves, which inundate low-lying areas adjacent to large bodies of water. The proposed site is situated approximately 630 to 880 feet above mean sea level and no large bodies of water are near. As a result, the potential for tsunamis and seiches to affect the site is considered negligible.

GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES

Energy Commission staff have reviewed applicable geologic maps and reports for this area (Rogers, 1965; Larose et al., 1999; DOGGR, 1982; Kohler and Miller, 1982; Miller, 1996. Based on this information and the information contained in the AFC, no known

geologic or mineralogic resources are located at or immediately adjacent to the proposed PEP site (Palomar Energy, 2001a). The applicant's consultant conducted a paleontologic resources field survey and a sensitivity analysis for the proposed PEP plant site. No significant fossil fragments were observed at the PEP site; nor have fossil fragments been identified within three miles of the project site. The site consists of igneous bedrock and young alluvial/colluvial soils derived from the bedrock. Based on this geology and staff's review of available information, the proposed PEP plant site and associated linear alignments do not have the potential to contain significant paleontologic resources.

PROJECT SPECIFIC IMPACTS

Seismicity represents the main geologic hazard at this site. No geologic, mineralogic, or paleontologic resources are known to exist in the area. Based on this information, the recommended Conditions of Certification included in the Facility Design section of this PSA are expected to mitigate geologic/paleontologic impacts to less than significant levels.

CUMULATIVE IMPACTS

The PEP site lies in an area that exhibits minor geologic hazards and no known geologic, mineralogic resources. Paleontologic resources have not been identified within three miles of the plant site or adjacent to the proposed linear facilities. The area is underlain by igneous bedrock at shallow depths. Conditions of Certification presented in the **FACILITY DESIGN** section assure that geologic/geotechnical LORS relating to design and construction of the PEP are followed. Based on this information, it is staff's opinion that the potential for significant adverse impacts resulting from geologic hazards, or impacting geologic, mineralogic, and paleontologic resources is very low for the proposed PEP. As a consequence, no such impacts would be cumulative with impacts from other current or future civil projects in the region.

FACILITY CLOSURE

A definition and general approach to closure is presented in the **GENERAL CONDITIONS** section of this assessment. Facility closure activities are not anticipated to impact geologic, mineralogic, or paleontologic resources. This is largely because no such resources are known to exist at the proposed project site. In addition, decommissioning and closure of the power plant should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed in plant decommissioning and closure will have been disturbed during construction and operation of the facility.

CONCLUSIONS AND RECOMMENDATIONS

If the applicant complies with all applicable LORS, the project should have no adverse impact with respect to design and construction of the project, and geologic, mineralogic, and paleontologic resources. Staff proposes to ensure compliance with applicable LORS with the adoption of the proposed Conditions of Certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

General Conditions of Certification with respect to Geology are covered under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1 and CIVIL-2** in the **FACILITY DESIGN** section.

REFERENCES

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POWER PLANT EFFICIENCY

Kevin Robinson and Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Palomar Energy Project (PEP) 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 PEP'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:

- examine whether the facility will likely present any adverse impacts upon energy resources;
- examine whether these adverse impacts are significant; and if so,
- examine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

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

Palomar Energy proposes to construct and operate the 504 MW (nominal net output, baseload) combined cycle, merchant PEP power plant to generate baseload and load following power, selling energy to the power market (Palomar 2001a, AFC §§ 2.4.2, 2.9). (This nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity may differ from this figure.). The PEP will consist of two General Electric (GE) Frame 7-FA combustion gas turbines with evaporative inlet air coolers/filters, two multi-pressure heat recovery steam generators (HRSGs) with duct burners, and one single three-pressure, reheat, condensing steam turbine (ST) generator producing a maximum of 229 MW, arranged in a two-on-one combined cycle train, totaling approximately 546 MW net output, peaking. The gas turbines and HRSGs will be equipped with dry low-NOx combustors, selective catalytic reduction and an oxidation catalyst to control air emissions (Palomar 2001a, AFC §§ 1.3.2, 2.4.1, 2.4.2, 2.4.3.1, 2.4.3.2). Natural gas will be delivered by the existing San Diego Gas & Electric (SDG&E) gas distribution system through a 2600-foot section of 16-inch upgraded pipeline.

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

Project Energy Requirements And Energy Use Efficiency

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. Under normal conditions, the PEP will burn natural gas at a nominal rate of 88 billion Btu per day, lower heating value (LHV) which is based on eight hours of base load operation and 16 hours of peak load operation. The fuel requirement for base load operation is approximately 3,444 million Btu per hour and 3,803 million Btu per hour for peaking (Palomar 2001a, AFC § 2.4.5). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies. Under expected project conditions, electricity will be generated at a full load efficiency of approximately 55.3 percent LHV without duct burning and 54.2 percent with duct burning (Palomar 2001a, AFC Figures 2.4-3, 2.4-4); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

Adverse Effects On Energy Supplies And Resources

The Applicant has described its sources of supply of natural gas for the project (Palomar 2001a, AFC §§ 2.4.5, 2.7.1, 4.3.4). Natural gas for the PEP will be supplied from the existing SDG&E system via 2,600 feet of upgraded 16-inch pipeline. With the increased natural gas capacity from the Line 6900 Expansion project and the current construction of the Bajanorte Pipeline project, the SDG&E gas system should be capable of delivering the required quantity of gas to the PEP.

The Line 6900 Expansion project has increased the capacity of the SDG&E gas system by 2,917 million Btu per hour in both the winter and summer. A redistribution will result from the completion of the Bajanorte Pipeline project's subtraction of load from the southern end of the SDG&E system (i.e., far from the SoCal Gas source), and the Palomar Energy Project's addition of load to the north end of the system (i.e., near the SoCal Gas source). As a result of this northward shift of customer loads, the SDG&E will increase its capacity by an additional 3,333 million Btu per hour in the winter and 1,667 million Btu per hour in the summer. This will result in a total increase to the SDG&E gas system of 6,250 million Btu per hour in the winter and 4,583 million Btu per hour in the summer (SER 2002). With these improvements in system load and delivery capability, it is highly unlikely that the project will create an adverse impact on natural gas supply in California.

Additional Energy Supply Requirements

Natural gas fuel will be supplied to the project by SDG&E via a 2,600-foot section of upgraded 16-inch pipeline (Palomar 2001a, AFC §§ 2.4.5, 2.7.1, 4.3.4).

The San Diego Air Pollution Control District expressed a concern in a letter dated April 19, 2002 regarding the capacity of the SDG&E gas system to deliver natural gas to the Palomar Energy Project. The District's concern focused on the possibility that the increased demand caused by Palomar might result in natural gas curtailment for some power plants with secondary oil firing. During times of natural gas curtailment, these power plants switch to oil firing, which has significant adverse impacts on ambient air quality (SDAPCD 2002).

In a response dated May 20, 2002, Sempra Energy Resources stated that any significant gas curtailments will be limited due to SDG&E increasing its natural gas capacity (SER 2002). This is done with the already completed Line 6900 Expansion project, as well as losing load from the southern end of the system with the expected September 2002 completion of the Bajanorte Pipeline project (Palomar 2001a, AFC § 4.3.4, table 4.3-2). Staff agrees that, with the completion of these improvements, there is no real likelihood that the PEP will require the development of additional energy supply capacity.

Compliance With Energy Standards

No standards apply to the efficiency of the PEP or other non-cogeneration projects.

Alternatives To Reduce Wasteful, Inefficient And Unnecessary Energy Consumption

The PEP 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 PEP will be configured as a combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates on heat energy recovered from the gas turbines' exhaust (Palomar 2001a, AFC §§ 1.3.2, 2.4.1, 2.4.2). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The Applicant proposes to use inlet air coolers, HRSG duct burners (re-heaters), three-pressure HRSG and steam turbine units and a circulating water system (Palomar 2001a, AFC §§ 1.3.2, 2.4.1, 2.4.2, 2.4.3.2, 2.4.6.4). Staff believes these features contribute to meaningful efficiency enhancement to the PEP. The two-train CT/HRSG configuration also allows for high efficiency during unit turndown because one CT/HRSG train can be shut down, leaving one fully loaded, efficiently operating CT/HRSG train instead of having two CT/HRSG trains operating at an inefficient 50 percent load.

The PEP includes HRSG duct burners, partially to replace heat to the ST cycle during high ambient temperatures when CT capacity drops, and partially to supply added peaking power. Duct firing also provides a number of operational benefits, such as load following and balancing and optimizing the operation of the ST cycle.

Equipment Selection

Modern gas turbines embody the most fuel-efficient electric generating technology available today. Currently available, large combustion turbine models can be grouped into three categories: conventional, advanced, and next generation. Advanced combustion turbines offer significant advantages for the PEP. Their higher firing temperatures offer higher efficiencies than conventional turbines. They offer proven technology with numerous installations and extensive run time in commercial operation. Emission levels are also proven, and guaranteed emission levels have been reduced based on operational experience and design optimization by the manufacturers (Palomar 2001a, AFC §§ 1.3.2, 2.4.2, 2.4.3.1, 2.4.3.2, 2.4.9.1).

One possible alternative to an F-class advanced gas turbine is a G-class next generation machine, such as the Siemens-Westinghouse 501G gas turbine generator,

which employs partial steam cooling to allow slightly higher temperatures, yielding slightly greater efficiency. The W501G is still relatively new; the first such machines began simple cycle operation at a site in Florida owned by Lakeland Electric and Water on April 16, 2001, and at PG&E Generating's Millennium combined cycle project in Charlton, Massachusetts on April 5, 2001 (GTW 2001). Given the minor efficiency improvement promised by the G-class turbine and the lack of a proven track record for the W501G, the applicant's decision to purchase F-class machines is a reasonable one.

Another possible alternative to the F-class advanced gas turbine is an H-class next generation machine with a claimed fuel efficiency of 60 percent LHV at ISO conditions (ME 2002). This high efficiency is achieved through a higher-pressure ratio and higher firing temperature, made possible by cooling the initial turbine stages with steam instead of air. The first Frame 7H application is expected to begin characterization testing to validate its long-term capabilities during the third quarter of 2002. Given the lack of proven performance, staff agrees with the applicant's decision to employ F-class machines.

The F-class of advanced gas turbines to be employed in the PEP, represent some of the most modern and efficient such machines now available. The applicant will employ two General Electric (GE) Frame 7-FA combustion gas turbine generators in a two-on-one combined cycle power train (Palomar 2001a, AFC §§ 1.3.2, 2.4.2, 2.4.3.1). This configuration is nominally rated at 530 MW and 56.5 percent efficiency LHV at ISO conditions (GTW 2000).

One possible alternative machine is the Alstom Power ABB KA24, a gas turbine nominally rated at 260 MW with a slightly higher efficiency rated at 56.5 percent LHV at ISO conditions (GTW 2000).

Another alternative is the Siemens-Westinghouse 501F, nominally rated in a two-on-one train combined cycle configuration at 550 MW and 55.8 percent efficiency LHV at ISO conditions (GTW 2000).

Any differences among the GE 7FA, ABB KA24, and W501FD in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, commercial availability, and ability to meet air pollution limitations. The ABB machine, for instance, is available only in one-on-one power trains, with one gas turbine and one steam turbine paired on a single shaft, generating a nominal 260 MW. The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer an advantage.

Efficiency Of Alternatives To The Project

The project objectives include generation of baseload electricity and ancillary services, as market conditions dictate (Palomar 2001a, AFC §§ 2.4.2, 2.9, 4.3.1). For further discussion of project alternatives, see the **Alternatives** section of this document.

Alternative Generating Technologies

Alternative generating technologies for the PEP are considered in the AFC (Palomar 2001a, AFC § 3). Fossil fuels, nuclear, solar, geothermal, hydroelectric, and wind

technologies are all considered. Given the project objectives, location, and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator. Fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant. 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. As a result, the power plant developer can purchase a turbine generator that not only offers the lowest available fuel costs, but at the same time sells for the lowest per-kilowatt capital cost.

Inlet Air Cooling

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler or fogger, and the chiller. Both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, slightly reducing overall net power output and overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial quantity of ammonia. An evaporative cooler or a fogger boosts power output best on dry days and uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ evaporative inlet air-cooling (Palomar 2001a, AFC §§ 2.4.2, 2.4.3.1). Given the climate at the project site, and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (combined cycle) and generating equipment (F-class gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

Cal Peak and Ramco operate nearby peaker power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the project. The Otay Mesa power plant, currently in construction, will draw natural gas from the south

end of the SDG&E gas distribution system, which will not be affected due to the previously discussed upgrades to the natural gas system. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the project will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the project. The older, less efficient power plants consume more natural gas to operate than the new, more efficient plants such as the PEP. Since natural gas will be burned by the power plants that are most competitive on the spot market, the most efficient plants will run the most. The high efficiency of the proposed PEP should allow it to compete very favorably, running at a high capacity factor, replacing less efficient power generating plants in the market, and therefore, not impacting or even reducing the cumulative amount of natural gas consumed for power generation.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, will neither influence nor be influenced by project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The project, if constructed and operated as proposed, would generate a nominal 500 MW of electric power at an overall project fuel efficiency between 54 and 55 percent LHV. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the project would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

No Conditions of Certification are proposed.

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POWER PLANT RELIABILITY

Kevin Robinson and Steve Baker

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Palomar Energy has predicted a 92 to 96 percent availability for the Palomar Energy Project (see below), staff evaluates the project's reliability against the benchmark identified above, rather than Palomar Energy's projection.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Presently, the only law, ordinance, regulation or standard (LORS) that establishes either power plant reliability criteria or a procedure for attaining reliable operation is executive order D-23-01, which is a California Independent System Operator (CaISO) Generation Maintenance Program. *Maintenance Performance Standards and Criteria* identifies maintenance standards that generators are expected to perform to. These standards and assessment guidelines provide a benchmark against which Generating Asset Owners and CaISO can judge the adequacy of the maintenance programs being used at each generating facility. However, the Energy Commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see **Setting** below).

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin." This amounted to having on-call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or

transmission facilities. The utilities generally maintained a seven- to-ten percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven- to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

In the current competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), an entity that purchases, dispatches, and sells electric power throughout the state. How Cal-ISO will ensure system reliability is still being determined; as of this writing, protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms being employed to ensure an adequate supply of reliable power.

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO.

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are thoroughly understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

Palomar Energy proposes to operate the 504 MW (nominal baseload output) Palomar Energy Project (PEP), selling energy and capacity to the power market (Palomar 2001a, AFC §§ 2.4.2, 2.9). The project is expected to operate at an overall availability in the range of 92 to 96 percent (Palomar 2001a, AFC §§ 2.4.2, 2.9, 4.3.1), and at a capacity factor, over the life of the plant, of 50 to 100 percent of base load (Palomar 2001a, AFC § 2.4.3.1).

ANALYSIS

The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages reduce its availability.

Measures of power plant reliability are based on a facility's actual ability to generate power when it is considered available and are based on starting failures and unplanned, or forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life (Palomar 2001a, AFC §§ 4.3.1, 6.3.1.2), the PEP will be expected to perform reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the PEP will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/ quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

Palomar Energy describes a QA/QC program (Palomar 2001a, AFC § 4.3.2) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification in the **Facility Design** section of this document.

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.

Palomar Energy plans to provide appropriate redundancy of function for the combined cycle portion of the project (Palomar 2001a, AFC §§ 4.3.3, 6.3.1.2, Table 4.3.1). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate at reduced output. Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers, and inverters. Other redundant balance of plant equipment include:

- two 100 percent boiler feed water pumps per HRSG (based on capacity serving each HRSG);
- three 100 percent or four 50 percent condensate pumps (Palomar 2002a);
- two 60 percent circulating water pumps; and
- two 100 percent air compressors.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient to assure reliable operation of the proposed facility.

Maintenance Program

Palomar Energy proposes to establish a preventive plant maintenance program typical of the industry (Palomar 2001a, AFC §§ 4.3.1, 6.3.1.2). Equipment manufacturers provide maintenance recommendations with their products. The applicant will base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages will be planned for periods of low electricity demand. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

The PEP will burn natural gas from the San Diego Gas & Electric (SDG&E) distribution system. Gas will be transmitted to the plant via an upgraded 16-inch diameter pipeline connection to the SDG&E's gas transmission system (Palomar 2001a, AFC §§ 1.1, 2.4.5, 2.7.1, 4.3.4). This SDG&E natural gas system represents a resource of considerable capacity. This system offers access to adequate supplies of gas (Palomar 2001a, AFC Appendix K).

In a letter dated April 19, 2002, a question was posed by the San Diego Air Pollution Control District regarding the capacity of the SDG&E gas system to deliver natural gas to the Palomar Energy project. The concern for the air district focused on the possibility that PEP's additional demand on the system could result in natural gas curtailment for some power plants with secondary oil firing. During times of natural gas curtailment, these power plants switch to oil firing, which has significant adverse impacts on ambient air quality (SDAPCD 2002).

In a response dated May 20, 2002, Sempra Energy Resources stated that any significant gas curtailments will be limited due to SDG&E increasing its natural gas capacity. This is done with the completed Line 6900 Expansion project, as well as losing load from the southern end of the system with the expected September 2002 completion of the Bajanorte Pipeline project (Palomar 2001a, AFC § 4.3.4, table 4.3-2).

With these improvements, staff believes there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

The PEP will obtain water from the City of Escondido's Hale Avenue Resource Recovery Facility (HARRF) for circulating water, HRSG's, CTG evaporative coolers, general plant service, and stored firewater (Palomar 2001a, AFC §§ 2.4.6, 2.4.6.2). The applicant predicts average water consumption of approximately 3,600,000 gallons per day (gpd). Potable water will be provided by the Rincon del Diablo Municipal Water District (Palomar 2001a, AFC § 2.4.6.2, Table 2.4-2). Staff believes these sources yield sufficient likelihood of a reliable supply of water. For further discussion of water supply, see the **Soil and Water Resources** section of this document.

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, flooding, tsunamis (tidal waves), and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) presents a credible threat to reliable operation.

Seismic Shaking

The site lies within Seismic Zone 4 (Palomar 2001a, AFC §§ 4.1.1, 5.5); see that portion of this document entitled **Geology, Mineral Resources, and Paleontology**. The project will be designed and constructed to the latest appropriate LORS (Palomar 2001a, AFC §§ 4.1.1, 5.5, Appendix D.2). Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this in **Facility Design**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (http://www.nerc.com). NERC reports that the availability factor for combined cycle units of all sizes for the years 1995 through 1999 was 90.87 percent (NERC 1999).

The gas turbines proposed for the project have been on the market for several years, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor in the 92 to 96 percent range (Palomar 2001a, AFC §§ 2.4.2, 2.9) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can be

expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact power plant reliability. Reliability impacts on the electric system from facility closure, should there be any, are discussed in the **Transmission System Engineering** section of this document.

CONCLUSION

Palomar Energy predicts an equivalent availability factor in the 92 to 96 percent range, which staff believes is achievable in light of the industry norm of 91.5 percent for this type of plant. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No Conditions of Certification are proposed.

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TRANSMISSION SYSTEM ENGINEERING

Henry Zaininger, Laiping Ng, and Al McCuen

SUMMARY OF CONCLUSIONS

Staff concludes that the power plant switchyard and outlet facility are acceptable and will comply with laws, ordinances, regulations and standards (LORS). However, a complete review of the California Independent System Operator (Cal-ISO) (updated DFS) study, and the applicant's mitigation plans will not be presented until the Final Staff Assessment (FSA). The review of the updated Detailed Facilities Study (DFS) and filings are incomplete, and staff is unable to fully evaluate downstream impacts and mitigation measures required for the reliable operation of the electrical transmission system. Therefore, staff cannot currently conclude that the project will comply with all applicable system reliability LORS. Staff is also unable to conclude that all of the potential downstream facilities required to reliably interconnect the project have been identified. Staff will complete its review and offer its recommendations in the FSA.

The applicant must identify their selected mitigation measures for reliability criteria violations so that staff may analyze the feasibility and impacts of those measures.

INTRODUCTION

The Transmission System Engineering (TSE) analysis identifies whether or not the transmission facilities associated with the proposed project conform to all applicable LORS required for safe and reliable electric power transmission, and assesses whether or not the applicant has accurately identified all interconnection facilities required as a result of the project.

Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant and provides proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (Cal. Code Reg., tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid. This evaluation must include any facilities beyond the project's interconnection with the existing transmission system, though such facilities are not under the permit authority of the Energy Commission, that are required as a result of the power plant addition to the California transmission system. The Cal-ISO is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Cal-ISO will provide testimony on these matters at the Energy Commission's hearings.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for construction of overhead and underground lines. Compliance with these orders ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of overhead electric lines and to the public in general.
- California Public Utilities Commission (CPUC) General Order 128(GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.
- The National Electric Safety Code, 1999 provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.
- The North American Reliability Council (NERC) and Western Systems Coordinating Council (WSCC) Planning Standards have been merged and now are referred to as the "NERC/WSCC Planning Standards." These standards provide the system performance standards used in assessing the reliability of the interconnected system. Certain aspects of the NERC/WSCC standards are either more stringent or more specific than the NERC standards. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WSCC system is based, to a large degree, on Section I.A of the standards, "NERC and WSCC Planning Standards with Table I and WSCC Disturbance-Performance Table" and on Section I.D, "NERC and WSCC Standards for Voltage support and Reactive Power." These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to levels designed to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines in a right of way and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WSCC 2001).
- Cal-ISO Grid Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the Cal-ISO transmission grid facilities. The Cal-ISO Grid Planning Standards incorporate the WSCC and NERC Planning Standards. With regard to power flow and stability simulations, these

Planning Standards are similar to the combined WSCC and NERC Planning Standards for Transmission System Contingency Performance. However, the Cal-ISO Standards also provide some additional requirements that are not found in the WSCC or NERC Planning Standards. The Cal-ISO Standards apply to all participating transmission owners interconnecting to the Cal-ISO controlled grid. They also indirectly apply when there are any impacts to the Cal-ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the Cal-ISO (Cal-ISO 2002a).

PROJECT DESCRIPTION

The Palomar Energy Project (PEP) consists of a natural gas-fired combined cycle power plant with an electrical output rating of 521 megawatts (MW), and a maximum electrical output of 545 MW during optimal winter conditions. While commercial operation was planned for summer 2004, the applicant has proposed a 21-month construction schedule. This schedule would result in an early 2005 on-line date. The project location is a 20-acre site within a planned 186-acre industrial park in the City of Escondido, San Diego County, California. The project site is located about one-quarter mile south of the existing Escondido substation.

POWER PLANT SWITCHYARD

The project contains two 220 MVA combustion turbine generators (CTGs) and one 250 MVA steam turbine generator (STG). Each of the CTGs and the STG generates power at 18 kV, and each generator is connected to the plant 230 kV switchyard using its own dedicated 18/230 kV step-up transformer. The 230 kV switchyard will be initially configured as a five-breaker ring bus, and will include space for expansion to a full breaker and a half configuration with space for an additional bay. Staff concludes that these facilities are acceptable.

TRANSMISSION LINE

The PEP switchyard will be connected to the San Diego Gas & Electric (SDG&E) transmission system via a loop-in of the existing 230 kV Escondido – Sycamore transmission line, which runs along the western boundary of the project site. The applicant states that the project does not require the construction of any new transmission lines (Palomar 2001a). The applicant provided a supplemental data response on June 26, 2002, which shows the existing and proposed conditions. Figures 145 (a) and 145 (b) of the June 26 filing show the existing transmission configuration and the layout of the interconnection with PEP respectively (Palomar 2002f). The drawings show that the 230 kV double circuit and 138 kV single circuit line positions in the existing right-of-way will be exchanged, so that the 230 kV Escondido - Sycamore Canyon will be adjacent to the PEP site, and would be looped into the PEP 230 kV switchyard without crossing the other lines. The drawings also show that several lattice towers will be replaced by steel poles as indicated in Section 2.6.1 of the Application For Certification (AFC). In the applicant's June 24, 2002 data response, further explanation of the loop-in structure and other changed structure configuration, conductor sizes and ratings were provided (Palomar 2002e). Staff concludes that these facilities are acceptable.

EXISTING FACILITIES AND RELATED SYSTEMS

Existing related electrical facilities in close proximity to the project include:

- the 230 kV Escondido – Sycamore transmission line to be looped into the proposed project; and
- the Escondido substation located about a quarter mile north of the proposed plant site.

ANALYSIS

SYSTEM RELIABILITY

Introduction

A System Impact Study (SIS) for connecting a new power plant to the existing power system grid is performed to determine the preferred and alternate interconnection facilities to the grid, downstream transmission system impacts and their mitigation measures in conformance with system performance levels as required in utility reliability criteria, NERC planning standards, WSCC reliability criteria and Cal-ISO reliability criteria. The study determines both positive and negative impacts, and for the reliability criteria violation cases (for the negative impacts) determines the preferred and alternate additional transmission facilities or other mitigation measures. The study is conducted with and without the new generation project and its interconnection facilities using the computer model base case for the year the generator project would come on-line. The study normally includes a Load Flow study, Transient Stability study, Post-transient Load Flow study and Short Circuit study. The study is focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), and short circuit duties. The study must be conducted under the normal condition (N-0) of the system and also for all credible contingency/emergency conditions, which includes the loss of a single system element (N-1) such as a transmission line, transformer, or generator and the simultaneous loss of two system elements (N-2), such as two transmission lines, or a transmission line and a generator. In addition to the above analysis, the studies may be performed to verify whether sufficient active or reactive power is available in the area system or area sub-system to which the new generator project would be interconnected. The SIS is followed by supplemental studies by the transmission owner with details provided in a final Facility Study.

Any new transmission facilities, such as a power plant switchyard, the outlet line, and downstream facilities required for connecting a project to the grid, are considered part of the project and are subject to the AFC review process.

Downstream facilities that are a reasonably foreseeable consequence of approval of the project receive a CEQA analysis but are not licensed by the Commission.

Draft System Impact/Facilities Study Summary

This summary is based on the applicant submittal of:

- PEP System Impact Study dated February 26, 2000 in Appendix B of the AFC (Palomar 2001a).
- A Draft Detailed Facilities Study (DFS) dated January 2002 in Appendix B.1 of Volume III of the AFC replacing the earlier SIS submitted on February 5, 2002 (Palomar 2002a).
- A Detailed Facilities Study dated March 2001 (should be 2002) was submitted April 17, 2002 in response to the March 8, 2002 staff data requests (Palomar 2002d).
- The data responses dated June 24, 2002 (Palomar 2002e).
- The March 2002 DFS modeled the SDG&E transmission system using these scenarios: expected 2004 heavy summer, maximum 3600 MW import into SDG&E; heavy summer, low 2000 MW import; and low load, 2100 MW import operating conditions. All the generation projects ahead of the PEP in the SDG&E generation interconnection queue were modeled. The DFS performed power flow, post transient voltage analysis, transient stability, and short circuit studies. Power flow studies included normal system conditions and a selected list of relevant single and multiple outages to identify thermal overloads and congestion issues. Conclusions drawn from the study are highlighted below:
- The DFS shows an overload of the Sycamore – Scripps 69 kV line to 105 percent normal rating when the PEP is dispatched at full MW output under base case conditions with no contingencies. The DFS further states that the 69 kV line upgrade is optional, but there will be significant dispatch constraints imposed on the PEP to mitigate this overload if the 69 kV line is not upgraded (Palomar 2002d).
- Appendix A2 of the DFS presents congestion management thermal loading results. Several lines overload for various contingencies with PEP installed. The mitigation measures to eliminate these overloads will be based on the updated studies discussed in the June 10, 2002 Cal-ISO letter contingent approval of the proposed interconnection of the PEP (Cal-ISO 2002b).
- Appendix B of the DFS presents voltage deviation results. The June 24, 2002 applicant's Data Responses states that there are no significant differences between pre-project and post-project voltage performances. Thus, there are no voltage criteria violations attributable to the PEP (Palomar 2002e).
- Detailed results of a sensitivity analysis without the Valley – Rainbow 500 kV line are presented in Appendix C of the DFS. Page 14 of the Detailed Facilities Study provides a brief description of the sensitivity analysis results. In this sensitivity case with lower imports, the Sycamore – Scripps 69 kV line overload during base case conditions without contingencies are eliminated. However, the contingency analysis results in Appendix C show that this line, plus several other facilities, overload during various contingencies. The June 24, 2002 applicant's Data Responses provide a more detailed comparison (Palomar 2002e). The discussion also refers to the results of the updated studies discussed in the Cal-ISO letter in which the advancement of SDG&E Project 00151 prior to the completion of the PEP eliminates the Scripps – Sycamore 69 kV line overloads in Appendix C (Cal-ISO 2002b).
- On page 13 of the DFS, under the section titled: "Winter Sensitivity Analysis," it states that no additional upgrades were identified as a result of the project output at

545 MW. However, no assumptions or results for this sensitivity case are included in the report. The June 24, 2002 applicant Data Responses (Palomar 2002e) refer to the results of the updated studies discussed in the Cal-ISO letter (Cal-ISO 2002b). In these updated studies, peak loads were reduced 50 percent, and no overloads due to the addition of the PEP were identified.

- A transient stability study was performed using expected 2004 heavy summer, high import, heavy summer low import and low load, low import scenarios. The transient stability studies show that the addition of the PEP does not adversely affect SDG&E and WSCC system stability.
- A short circuit study was performed considering three-phase and single line-to-ground faults with and without PEP. The results show that adding the PEP does not cause breaker fault duty ratings to be exceeded.

Cal-ISO Summary

As described in their June 10, 2002 letter, the Cal-ISO reviewed the DFS performed by SDG&E and requested additional studies due to the need to change several study assumptions since the original studies were performed (Cal-ISO 2002b). The original DFS used the same system models as the SIS. Since that time, the Valley-Rainbow Transmission Project was delayed from 2004 to 2005, SDG&E's load forecast was substantially reduced due to energy conservation, economic slowdown, and several transmission projects were cancelled or delayed due to the reduced load forecast. SDG&E performed the requested studies and sent the study results to the Cal-ISO. After the Cal-ISO reviewed the system models, several inconsistencies in the models were identified. The Cal-ISO performed additional studies with the corrected models. The Cal-ISO analysis also included off-peak load studies, and low import level studies.

SDG&E provided comments on several of the Cal-ISO conclusions and recommendations in their July 9, 2002 letter from K. Patel of SDG&E to J. Miller of the Cal-ISO (SDG&E 2002a).

Cal-ISO conclusions and recommendations (Cal-ISO 2002b) and associated SDG&E comments (SDG&E 2002a) are summarized, as follows, based on their study results:

- The Cal-ISO updated studies state that overloading on the Sycamore-Scripps 69 kV line is a result of high load and imports. This loading is not particularly sensitive to the PEP generation with the latest load forecast and without the Valley-Rainbow Transmission Project (Cal-ISO 2002b). SDG&E disagreed with the Cal-ISO regarding the sensitivity of the overloading due to the PEP generation. However, the applicant has agreed to fund the advancement of the SDG&E Project 00151 prior to the completion of PEP, which will eliminate this potential overload (SDG&E 2002a).
- The Cal-ISO concurred with SDG&E that the PEP generation project would not cause any adverse impacts in the year 2004 if the Valley-Rainbow Project is not constructed and the Sycamore 230/138 kV transformer (Project 00151) is installed, except for the emergency overloading on the Escondido-Esco 69 kV line. This overloading can be mitigated by dispatching the Goal Line generation unit. If the Goal Line generation cannot be dispatched, the PEP generation will need to be reduced to eliminate the overload. Since the Goal Line generation is a peaking unit and does not have an RMR contract, there is no guarantee that this unit can be

dispatched as needed. Therefore, the Cal-ISO recommends the installation of a Special Protection System (SPS) to trip some of the PEP generation for an outage of the Poway-Pomerado 69 kV transmission line. SDG&E states that the Goal Line generating unit is a QF, and is expected to run throughout the year. They recommend that the Cal-ISO invoke dispatch constraints on the PEP in lieu of installing SPS (SDG&E 2002a).

- If the Sycamore 230/138 kV transformer project (Project 00151) is deferred, as presently planned by SDG&E, the PEP generation may cause emergency overloadings on three 69 kV transmission lines. The Cal-ISO requested that SDG&E either advance Transmission Project 00151 to the year 2004 or install a temporary SPS to trip some of the PEP generation for an outage of either the Palomar-Escondido or Penasquitos-Encina 230 kV transmission lines until Project 00151 is implemented. SDG&E states that the Sycamore 230/138 kV transformer project (Project 00151) is needed to avoid the overloads (SDG&E 2002a). The applicant has agreed to fund the advancement of the Project 00151 to mitigate this problem.
- The PEP is not expected to have any negative impact under low load conditions, either with high or low SDG&E generation.
- The PEP is not expected to cause any dynamic stability criteria violations and is not expected to overstress any circuit breakers.
- If the Southwest Power Link is out of service, the project owner may be required to reduce the PEP generation to avoid overloads in case of a subsequent contingency. SDG&E states that conversations and emails, subsequent to the Cal-ISO letter, have shown that the Cal-ISO believes this recommendation is no longer applicable (SDG&E 2002a).
- The Cal-ISO has granted final contingent approval to connect the Palomar Energy Project to the grid on the condition that the Cal-ISO recommendations, listed above, are satisfied (Cal-ISO 2002b).

Cumulative impacts

The DFS modeled the proposed Valley – Rainbow line plus several other proposed transmission projects. Cumulative potential impacts for the proposed generation projects outside the SDG&E area were modeled by studying transmission reliability impacts at maximum SDG&E system import levels. The recently completed Cal-ISO assessment was made using up-to-date generation, transmission and load projections for the SDG&E system. Therefore, cumulative new generation and transmission impacts are being appropriately considered in this PEP assessment through identification of mitigation measures. Staff will complete its review and provide its conclusions in the FSA.

STUDY CONCLUSIONS

While the Cal-ISO and SDG&E disagree on some of the assumptions used in the DFS, both the Cal-ISO and the SDG&E DFS studies identify some 69 kV transmission line overloads. Both studies agree that these overloads would be mitigated by advancing the installation of the Sycamore 230/138 kV transformer project (Project 00151).

Regarding the emergency overloading of the Escondido-Esco 69 kV line, the Cal-ISO recommended the installation of a SPS to trip some of the PEP generation for an outage of the Poway-Pomerado 69 kV transmission line. SDG&E recommended that the Cal-ISO invoke dispatch constraints on the PEP in lieu of installing SPS (SDG&E 2002a). Currently, staff has not yet received mitigation plans from the applicant to address their actions and identify selected mitigation. Therefore, staff cannot currently conclude that the project will comply with all applicable system reliability LORS. Staff is also unable to conclude that all of the potential downstream facilities required to reliably interconnect the proposed project have been identified. Staff will discuss these issues with the applicant and the Cal-ISO. Staff will complete its review and offer its conclusions in the FSA.

TRANSMISSION ALTERNATIVES

TRANSMISSION LINE ROUTE ALTERNATIVES

The project is directly connected to the existing 230 kV Escondido – Sycamore Canyon transmission line which runs along the western boundary of the project site. No new transmission lines have been proposed. Thus alternative transmission route alternatives were not considered.

INTERCONNECTION ALTERNATIVES

The System Impact Study contained in Appendix B of the AFC (Palomar 2001a) studied five 500 MW alternative sites, listed here in order of increasing in transmission reinforcement cost:

1. 500 MW near Escondido (loop in Escondido – Sycamore 230 kV line);
2. 500 MW near Escondido (loop in Encina – Escondido and Escondido – Sycamore 230 kV lines);
3. 250 MW near Escondido and 250 MW at San Marcos;
4. 500 MW near Escondido (loop in Encina – Escondido 230 kV line); and
5. 500 MW near Escondido (two 138 kV lines).

The proposed PEP alternative had the lowest transmission reinforcement cost and was studied in detail in the DFS.

FACILITY CLOSURE

PLANNED CLOSURE

Planned closure occurs in a planned and orderly manner, such as at the end of the power plant's useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the owner is required to provide a closure plan 12 months prior to closure, which, 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 Participating Transmission Owner (PTO), in

this case SDG&E, to assure 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. The facility closure plan will address all such TSE issues.

UNEXPECTED TEMPORARY CLOSURE

An unplanned closure occurs when the facility is closed suddenly 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 establishing an on-site contingency plan (see **General Conditions Including Compliance Monitoring and Closure Plan**).

UNEXPECTED PERMANENT CLOSURE

An unplanned closure may become permanent. 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 to assure safety and reliability must be in place and approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facilities (see **General Conditions Including Compliance Monitoring and Closure Plan**).

RESPONSES TO PUBLIC COMMENTS

No agency or public comments related to the TSE discipline have been referred to TSE staff for this case.

CONCLUSIONS AND RECOMMENDATIONS

- Staff concludes that the power plant switchyard and outlet facilities are acceptable and will comply with LORS assuming implementation of the proposed Conditions of Certification.
- The Cal-ISO granted final contingent approval to connect the Palomar Energy Project to the grid on the condition that the Cal-ISO recommendations listed in the Cal-ISO summary section are satisfied (Cal-ISO 2002b).
- The applicant's mitigation plans in the updated DFS associate with the Cal-ISO final contingent approval, the issues discussed in the July 9 SDG&E letter (SDG&E 2002a), and any other problems that arise need to be resolved prior to the FSA.
- Since the review of the updated Detailed Facilities Study and filings are incomplete, staff is unable to fully evaluate downstream impacts, transmission facilities and/or mitigation measures required for the reliable operation of the electrical transmission system. Therefore, staff cannot currently conclude that the project will comply with all applicable system reliability LORS. Staff is also unable to conclude that all of the potential downstream facilities required to reliably connect the proposed project to

the transmission system have been identified. Staff will complete its review and offer its recommendations in the FSA.

- To resolves system reliability uncertainties, the applicant must identify the selected mitigation measures for the overloaded lines discussed previously and provide backup data which provides the assumptions and analysis used in the Cal-ISO's evaluation (Cal-ISO 2002b).

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Grounding System

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; and D) a mechanical engineer. (Business and Professions Code sections 6704 et seq.,

require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 The project owner shall keep the CBO informed regarding the status of engineering design and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy

documentation shall become a controlled document and shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification.

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM which include the documentation of any discrepancies identified by the project owner. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

a) receipt or delay of major electrical equipment;

b) testing or energization of major electrical equipment; and

c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The substitution of CPM and CBO approved "equivalent" equipment and equivalent substation configurations is acceptable. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders," National Electric Code (NEC) and related industry standards.

b) Breakers and busses in the power plan switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

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 project conductors shall be sized to accommodate the full output from the project.

e) Termination facilities shall comply with applicable SGD&E interconnection standards.

f) The project owner shall provide:

   i) The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,

   ii) Executed Facility Interconnection Agreement

   iii) Verification of Cal-ISO Notice of Synchronization.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lessor number of days mutually agree to by the project owner and CBO), the project owner shall submit to the CBO for approval:

a) Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders," NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders," NEC, applicable interconnection standards, and related industry standards.

c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.

d) The DFS operational mitigation measures, SPS, executed Facility Interconnection Agreement and Verification of Cal-ISO Notice of Synchronization shall be provided concurrently to the CPM and CBO. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CBO approval.

[1] Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to requirements of **TSE-5** and request approval to implement such changes.

TSE-7 The project owner shall provide the following Notice to the Cal-ISO prior to synchronizing the facility with the California Transmission system:

a) At least one week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization; and

b) At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the Cal-ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the Cal-ISO letter to the CPM when it is sent to the Cal-ISO one week prior to initial synchronization with the grid. The project owner shall contact the Cal-ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 to 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the Cal-ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders," applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

a) "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric

Safety Orders," and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

b) An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the Compliance Monitoring Plan.

c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

REFERENCES

Cal-ISO (California Independent System Operator) 1998a. Cal-ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

Cal-ISO (California Independent System Operator) 1998b. Cal-ISO Dispatch Protocol posted April 1998.

Cal-ISO (California Independent System Operator) 2002a. Cal-ISO Grid Planning Standards, February 2002.

Cal-ISO (California Independent System Operator). Cal-ISO 2002b. Letter to Ms. Leslie Padilla, Sempra Energy Resources Dated June 10, 2002. Copy to Al McCuen, California Energy Commission.

NERC (North American Electric Reliability Council) 1998. NERC Planning Standards, September 1997.

Palomar Energy, LLC, San Diego, California (Palomar) 2001a. Application for Certification, Volumes I & II. Submitted to the California Energy Commission on November 28, 2001.

Palomar Energy, LLC, San Diego, California (Palomar) 2002a. Volume III: Data Responses. Submitted to the California Energy Commission on February 5, 2002.

Palomar Energy, LLC, San Diego, California (Palomar) 2002b. Responses to CEC Staff's Data Requests 1-117. Submitted to the California Energy Commission on April 8, 2002.

Palomar Energy, LLC, San Diego, California (Palomar) 2002c. Applicant's Supplemental Responses to CEC Staff Data Requests. Submitted to the California Energy Commission on May 8, 2002.

Palomar Energy, LLC, San Diego, California (Palomar) 2002d. Applicant's Detailed Facilities Study Final Report Dated March 2001 (should be 2002). Submitted to the California Energy Commission on April 17, 2002.

Palomar Energy, LLC, San Diego, California (Palomar) 2002e. Applicant's Supplemental Responses to CEC Staff Data Requests. Submitted to the California Energy Commission on June 24, 2002.

Palomar Energy, LLC, San Diego, California (Palomar) 2002f. Applicant's Supplemental Responses to CEC Staff Data Requests. Submitted to the California Energy Commission on June 26, 2002.

SDG&E (San Diego Gas & Electric) 2002a. Letter from Kishore Patel, SDG&E, to Jeffrey Miller, Cal-ISO, regarding Sempra Palomar Energy Project – Cal-ISO Review. July 9, 2002.

WSCC (Western Systems Coordinating Council) 2001. NERC/WSCC Planning Standards, June 2001.

DEFINITION OF TERMS

AAC — All Aluminum conductor.

Ampacity — Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.

Ampere — The unit of current flowing in a conductor.

Bundled — Two wires, 18 inches apart.

Bus — Conductors that serve as a common connection for two or more circuits.

Conductor — The part of the transmission line (the wire) which carries the current.

Congestion Management
Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.

Emergency Overload
See Single Contingency. This is also called an L-1.

Kcmil or kcm
Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV)
A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.

Loop An electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar One megavolt ampere reactive.

Megavars Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA)
A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW)
A unit of power equivalent to 1,341 horsepower.

Multiple Contingencies
A condition that occurs when more than one major transmission element (circuit, transformer, circuit breaker, etc.) or more than one generator is out of service

Normal Operation/ Normal Overload
When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition
See Single Contingency.

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow AnalySI/FS
A power flow analySI/FS is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power
Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An

adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial Action Scheme (RAS)
A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6 Sulfur hexafluoride is an insulating medium.

Single Contingency
Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable
Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating
See ampacity.

TSE Transmission System Engineering.

Undercrossing
A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild
A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Suzanne Phinney

INTRODUCTION

This section considers potential alternatives to the construction and operation of the proposed Palomar Energy Project (PEP). The purpose of this alternatives analysis is to comply with California's environmental laws by providing an analysis of a reasonable range of feasible alternatives that could substantially reduce or avoid any potentially significant adverse impacts of the proposed project (Cal. Code Regs., tit. 14, §15126.6; Cal. Code Regs., tit. 20, §1765). This section identifies potentially significant impacts of the proposed project and analyzes different technologies and alternative sites that may reduce or avoid significant impacts. Staff also analyzes the impacts that may be created by locating the project at alternative sites.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations Section 15126.6(a), provide direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." In addition, the analysis must address the No Project Alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the "rule of reason" which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. The California Environmental Quality Act (CEQA) states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative (Cal. Code Regs., tit. 14, §15125(d)(5)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (City of Santee v. County of San Diego (4th Dist. 1989) 214 Cal. App. 3d 1438).

DESCRIPTION OF THE PROPOSED PROJECT

The proposed PEP would be a nominal 500-megawatt (MW) natural-gas-fired combined cycle power plant and associated infrastructure. The site is located on a vacant 20-acre site within a planned 186-acre industrial park in the City of Escondido, San Diego County, California. The site is located west of Interstate 15 and south of State Highway 78, approximately 600 feet southwest of the intersection of Vineyard Avenue and Enterprise Street.

The site is within a Specific Planning Area as identified in the Land Use Element of the City of Escondido General Plan and is zoned “S-P” (Specific Plan). Although construction of a power plant at this site is predominantly consistent with the City of Escondido’s General Plan and Specific Plan, applications for amendments have been submitted to ensure consistency (Palomar 2001a). Staff has worked closely with the City of Escondido to coordinate the City’s review of the overall Escondido Research and Technology Center (ERTC) Project with the Energy Commission’s review of the proposed PEP. Staff is currently reviewing the City’s Draft Environmental Impact Report (DEIR) on the ERTC Specific Plan released July 16, 2002 to ensure consistency.

The nearest residence to the PEP project is 1,800 feet west of the proposed site and there is a residential area 2,800 feet southeast of the PEP. The Del Dios Middle School is one mile southeast of the proposed PEP site. The Little Country Preschool and an undeveloped park are one mile south of the proposed site.

The PEP would consist of two combustion turbine-generators equipped with dry low-NOx combustors and evaporative inlet air coolers, two heat recovery steam generators equipped with duct burners, a steam turbine-generator and associated auxiliary systems and equipment. A new 230 kV switchyard would connect with the SDG&E transmission system via a loop-in of the existing 230 kV Escondido-Sycamore Canyon transmission line which runs along the western boundary of the project site (Palomar 2001a). The project would not require construction of any new transmission lines.

The project would be fueled with natural gas delivered via the San Diego Gas & Electric (SDG&E) gas system. An existing SDG&E natural gas pipeline with sufficient capacity to serve the project is located immediately adjacent to the northeast corner of the site at the end of Enterprise Street (Palomar 2001a). In order to relieve a bottleneck in a segment of the existing SDG&E gas system located about one mile northeast of the project site, SDG&E will upgrade approximately 2,600 feet of the existing pipeline to 16-inch pipeline (Palomar 2001a).

Reclaimed water for the project will be supplied from the City of Escondido’s Hale Avenue Resource Recovery Facility (HARRF) via a new 1.1 mile, 16-inch pipeline extending from an existing reclaimed water main. Brine from the project, consisting entirely of cooling tower blowdown, will be returned to the HARRF via a new 1.1 mile, 8-inch return pipeline routed alongside the reclaimed water supply pipeline.

SITE SELECTION

The site selection criteria listed below were used by the applicant for choosing the proposed site. However, staff does not necessarily concur with all the criteria. The project objectives, as determined by staff, are listed in the following section.

According to the AFC, the Applicant chose the proposed site for the following reasons (Palomar 2001a):

- the site has access to an existing transmission substation that feeds the SDG&E load pocket and can accommodate a 500 MW facility;
- the site avoids construction of new transmission lines;
- the site is accessible to a non-potable water supply that is able to support the project;
- the site minimizes the need for upgrades to the SDG&E natural gas system; and
- the project would be consistent with the existing and planned land uses

SCOPE AND METHODOLOGY OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to provide a reasonable range of feasible alternatives that could substantially reduce or avoid any potentially significant adverse impacts of the proposed project. To accomplish this, staff must determine the appropriate scope of analysis. Consequently, it is necessary to identify and determine the potentially significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding the significant impacts of the proposed project.

To prepare this alternatives analysis, staff:

- identified the basic objectives of the project, provided an overview of the project, and described its potentially significant adverse impacts;
- identified and evaluated alternative locations or sites;
- identified and evaluated technology alternatives to the project, including conservation and renewable sources; and
- evaluated the impacts of not constructing the project, known as the No Project Alternative under CEQA.

PROJECT OBJECTIVES

Based on analysis of the PEP Application for Certification (AFC), the Energy Commission staff has determined the project's objectives as:

- generation of approximately 500 MW of load-serving capability in a location with access to SDG&E's load pocket;
- location near an electrical substation and key infrastructure for natural gas and non-potable water supply; and
- commercial operation by approximately 2004.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

Staff has determined that, based on information available at this time, significant air quality impacts to ozone and PM_{10} remain unmitigated. All other potentially significant environmental impacts can be mitigated to a level of insignificance by implementation of mitigation measures identified in the PSA.

SITE ALTERNATIVES

The applicant presented eight sites, excluding the proposed site, in the AFC's Alternatives section (3.0). Five of those sites have been eliminated from this analysis. The following discussion includes an analysis of the three alternative sites retained for further analysis, as well as a discussion of the alternative sites eliminated from detailed evaluation (see page 9 of this section).

SCREENING CRITERIA USED TO SELECT SITE ALTERNATIVES

The following criteria were used to identify potential alternative sites:

1. the site should avoid or substantially lessen one or more of the potential significant effects of the project;

2. in order to meet reliability objectives, the site should have access to SDG&E's load pocket;

3. sufficient land is needed to construct and operate a generating facility of this size. The proposed power plant would require 14.1 acres located on a 20-acre parcel of land. Therefore, staff used approximately 14 acres as the minimum lot size needed to accommodate the facility; and

4. the site should be within a reasonable distance of natural gas and water supply, and transmission interconnections.

Three alternative sites are evaluated in detail: San Marcos Site, Sycamore Canyon Site, and Talega Site. Please see **ALTERNATIVES Figure 1** for a map of these sites.

Placeholder for **Alternatives Figure 1**

SAN MARCOS SITE

The San Marcos Site is an approximately 15-acre parcel, which is consistent with the actual site requirement for the PEP. The parcel is zoned “SWM” (solid waste management) and is located on Hidden Canyon Road approximately 7.2 miles southwest of the Escondido Substation (City of San Marcos 2002). The site is approximately two miles south of the City of San Marcos in San Diego County. The topography of the general area is hilly, although the San Marcos Site, which is tucked into a valley, is relatively flat.

The site includes the retired North County Resource Recovery Facility (NCRRF) previously owned by the County of San Diego and sold to Allied Waste Industries. Immediately adjacent to the site is a vacant parcel previously used for green waste disposal. The site is vacant with the exception of a large, empty building and is adjacent to a closed County landfill (County of San Diego 2002; City of San Marcos 2002). The nearest residence to the San Marcos Site is approximately 0.6 miles northeast in the San Elijo Hills community. A hillside would block views of the power plant from this community. New housing developments under construction would result in residences even closer to the site.

SDG&E’s Escondido-Sycamore Canyon 230 kV transmission line borders the site. The availability of water has not yet been confirmed but dry cooling is considered to be feasible in this area (note that Calpine’s recently approved Otay Mesa project in southern San Diego County will use dry cooling on its 15 acre site)

This site was previously used as a recycling facility, which required regular access by a large number of trucks. Therefore adequate access to the site during construction and operation is available. The NCRRF used electricity as its power source and availability of natural gas to this site would require further analysis. Landfill gas would be available from the adjacent landfill (County of San Diego, 2002). Construction of a new gas pipeline would result in greater environmental impacts as compared to the readily available natural gas access at the proposed PEP site.

SYCAMORE CANYON SITE

The Sycamore Canyon Site is an unspecified sized site located immediately north of the Marine Corps Air Station (MCAS) Miramar. The site is approximately two and one-quarter miles south of the City of Poway in San Diego County. Industrial buildings are located north of the site along the ridge. There are access roads that run along both the northern and southern ridge of the canyon. However, road improvements may be necessary to support heavy load trucks during construction.

The MCAS Miramar provides habitat of importance to a wide variety of wildlife species, including a number of special status species. The entire eastern portion of the MCAS Miramar (i.e., east of Interstate 15) functions as an important habitat linkage with adjoining open spaces (MCAS Miramar 2000). The alternative site is immediately north of the eastern side of the MCAS Miramar. The potential adverse impacts on the

species occupying the MCAS Miramar would need to be evaluated closely for potential project effects.

The site is located in a canyon with the adjacent hillsides covered with shrubs. The nearest residential sensitive receptor is greater than one mile to the east. There are several transmission lines, and a large substation in the canyon. Abandoned buildings that were previously used for weapons testing are located at the east end of the southern ridge road.

Existing SDG&E's 230 kV transmission lines are immediately adjacent to the site. Access to an available natural gas supply would be further than for the proposed site. The availability of water has not yet been confirmed, but dry cooling is considered to be feasible in this area.

Transmission is easily accessible from this alternative site. Residential sensitive receptors are not in close proximity to the site. The general topography of the area is very hilly and grading would be necessary for access. Availability of natural gas would need to be explored further and may have more impacts than the proposed site if construction of a pipeline were required. Potential impacts to biological resources in adjacent areas may be significant pending further analysis.

TALEGA SITE

The Talega Site is a general site of unspecified size located immediately north of the U.S. Marine Corps Base Camp Pendleton on the south side of Avo Pico Road northeast of the City of San Clemente. The site is located in Orange County, approximately one-quarter mile north of the San Diego County line. It is approximately two miles east of Interstate 5.

The site area is currently used for agriculture. The nearest residential sensitive receptor is greater than one mile away. Existing SDG&E 230 kV transmission lines cross the western border of the site. Access to an available natural gas supply would be further than the proposed site. The availability of water has not yet been confirmed, but dry cooling is considered to be feasible in this area.

A campground is 0.5 mile northwest of the site. The potential visual and recreational impacts to users of the campground would need to be further analyzed due to its proximity to the alternative site. In addition, a power plant at this site could be within the viewshed of motorists traveling on Interstate 5, the Pacific Coast Highway.

The area of Camp Pendleton south of the alternative site contains a mixture of native grasslands and coastal sage scrub (Camp Pendleton 2001). The large undeveloped portions of Camp Pendleton support a variety of wildlife species, including a number of Federal and State special status species. Large areas of coastal sage shrublands are often occupied by the federally threatened California gnatcatcher (Camp Pendleton 2001). Surveys of the area surrounding the site would be required to assess the potential significant impacts to biological resources.

Transmission is easily accessible from the alternative site. Residential sensitive receptors are not in close proximity to the site. Availability of natural gas would need to be explored further. Construction of a pipeline to supply gas would result in greater impacts than the proposed site. Potential impacts to biological and visual resources may be significant and would require further analysis.

NO PROJECT ALTERNATIVE

The No Project Alternative under CEQA assumes that the PEP project is not constructed. In the CEQA analysis, the No Project Alternative is compared to the proposed project and determined to be superior, equivalent, or inferior to it. The CEQA Guidelines state that "the purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project" (Cal. Code Regs., tit. §15126.6(i)). 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…" (§15126.6(e)(2)).

If the PEP facility were not constructed, the proposed site would be developed as part of the planned 186-acre industrial park, contingent upon ERTC approval, and permitted uses would include light industrial. Those uses would not likely require the quantity of water or natural gas as proposed for the PEP. Therefore, the water would be available for other uses and an immediate upgrade to SDG&E's natural gas pipeline would not be required.

However, if the PEP project was not constructed, it would not contribute to California's electricity resources, increase competition, and help form a more reliable electric system that meets the goals of the deregulated energy market. Power plants would likely be constructed in other areas. Due to market forces, the proposed facility may also serve to replace older, inefficient facilities. This replacement may not occur in the absence of the plant's construction.

ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

This section describes alternatives that did not satisfy the screening criteria for inclusion in the more detailed analysis presented above, and include the following:

- additional site locations;
- demand side management;
- distributed generation; and
- renewable resources.

These alternatives, and the reasons for their not being considered in detail in this analysis, are addressed below.

SITE ALTERNATIVES ELIMINATED FROM THIS ANALYSIS

CEQA guidelines state that the alternatives discussion need not consider alternatives that are either infeasible or do not avoid significant environmental impacts. The following sites were considered as alternatives to the PEP project in the AFC, but were eliminated from further consideration for the reasons noted.

- **Penasquitos:** The location is largely residential and a power plant would be incompatible with adjacent land uses.
- **Mission:** There is insufficient space available at the site to construct a 500 MW power plant.
- **San Luis Rey:** The location is largely residential and a power plant would be incompatible with adjacent land uses.
- **Rainbow:** Accessibility to this location would be difficult and could affect an adjacent low-income community.
- **Sampson:** Sufficient space for a 500 MW power plant may be problematic at this site and substantial upgrades to the SDG&E gas system would be required.

TECHNOLOGY ALTERNATIVES

Conservation and Demand-Side Management

Conservation and demand-side management (DSM) include a variety of approaches, including energy efficiency and conservation, building and appliance standards, load management and fuel substitution. Public Resources Code Section 25305(c) states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's energy forecasts and shall not be considered as alternatives to a proposed facility during the siting process. The forecast that will address this issue is the Energy Commission's California Energy Outlook. Thus, such alternatives are not included in this analysis.

Since 1975, the displaced peak demand from all of these efforts has been roughly the equivalent of eighteen 500-MW power plants. At a state level, the annual impact of building and appliance standards has increased steadily, from 600 MW in 1980 to 5,400 MW in 2000, as more new buildings and homes are built under increasingly efficient standards. Savings from energy efficiency programs implemented by utilities and state agencies have also increased (from 750 MW to 3,300 MW). Recent demand reducing proposals from the Governor and Legislature have proven to have an impact by reducing consumption by an average of 3,500 MW during the summer of 2001 (CEC 2001a). In addition, voluntary conservation measures adopted by residential and commercial/industrial users led to a 7.5 percent drop in electricity use throughout the state as of August 2001, but that dropped to 1.5 percent in October 2001 (CEC 2001a). There was a 0.7 percent increase in energy used in February 2002 compared to February 2001 (CEC 2002). However, in comparison to February 2000, there was a 5.5 percent decrease in energy consumption in February 2002 (CEC 2002).

GENERATION TECHNOLOGY ALTERNATIVES

Staff considered several alternative generation technologies that do not burn fossil fuels: solar, wind, biomass, geothermal, and hydropower.

Solar Generation

There are two types of solar generation: solar thermal power and photovoltaic (PV) power generation.

Solar thermal power generation involves the conversion of solar radiation to thermal energy, which is then used to run a conventional steam power system. Solar thermal is a viable alternative to conventional generation systems and, depending on the technology, is suited to either distributed generation on the kW scale or to centralized power generation on scales up to several hundred MW. Solar thermal systems utilize three designs to generate electricity: parabolic trough concentrating collectors, power tower/heliostat configurations, and parabolic dish collectors. Parabolic trough and power tower systems typically run conventional power units, such as steam turbines, while parabolic dish systems power a small engine at the focal point of the collector.

PV power generation involves the direct conversion of light to electricity. PV is best suited to distributed generation uses rather than centralized power generation. PV is the most capital intensive of any alternative generation technology (Aspen 2001). PV power systems consist of solar electric modules (built from PV cells) assembled into arrays of varying sizes to produce electric power proportional to the area of the array and the intensity of the sunlight. PV arrays can be mounted on either the ground or on buildings. They can be installed on dual-purpose structures such as covered parking lots.

Solar resources would require large land areas in order to generate 500 MW of electricity. Specifically, assuming location in an area receiving maximum solar exposure (such as desert areas of San Bernardino County), central receiver solar thermal projects require approximately five acres per MW, so 500 MW would require approximately 2,500 acres, or over 160 times the amount of land area taken by the proposed plant site and linear facilities. One square kilometer of PV generation (400 acres) can produce 100 MW of power, so 500 MW would require approximately 2000 acres or over 130 times the amount of land area required for the proposed PEP project.

Although air emissions are significantly reduced or eliminated for solar facilities, these facilities can have significant visual effects. Solar generation results in the absence or reduction in air pollutant emissions, and visible plumes. Water consumption for solar generation is substantially less than for a natural gas fired plant because there is no thermal cooling requirement.

Like all technologies generating power for sale into the State's power grid, solar thermal facilities and PV generation require near access to transmission lines. Large solar thermal plants must be located in desert areas with high direct normal insolation, and in these remote areas, transmission availability is limited. Additionally, solar energy technologies cannot provide full-time availability due to the natural intermittent

availability of sunlight. Therefore, solar thermal power and photovoltaic power generation would not successfully meet the project objectives.

Wind Generation

Wind carries kinetic energy that can be used to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind's kinetic energy into electricity. Modern wind turbines represent viable alternatives to large bulk power fossil power plants as well as small-scale distributed systems. The range of capacity for an individual wind turbine today ranges from 400 watts up to 3.6 MW. California's 1,700 MW of wind power represents 1.5 percent of the state's electrical capacity (Aspen 2001).

Although air emissions are significantly reduced or eliminated for wind facilities, these facilities can have significant visual effects. Wind turbines have also caused bird mortality (especially for raptors) resulting from collision with rotating blades although this effect is more noted in the Altamont Pass area than in other parts of the state.

Wind resources require large land areas in order to generate 500 MW of electricity. Depending on the size of the wind turbines, wind generation "farms" generally can require between five and 17 acres to generate one megawatt (CEC 2001b). A 500 MW plant would therefore require between 2,500 and 8,500 acres. Although 7,000 MW of new power wind capacity could cost-effectively be added to California's power supply, the lack of available transmission access is an important barrier to wind power development (Beck et al. 2001). California has a diversity of existing and potential wind resource regions that are near load centers such as San Francisco, Los Angeles, San Diego and Sacramento (CEC 2001c). However, wind energy technologies cannot provide full-time availability due to the natural intermittent availability of wind resources. Therefore, wind generation technology would not meet the project's goal, which is to provide load-serving capacity.

Biomass Generation

Biomass generation uses a waste vegetation fuel source such as wood chips (the preferred source) or agricultural waste. The fuel is burned to generate steam. Biomass facilities generate substantially greater quantities of air pollutant emissions than natural gas burning facilities. In addition, biomass plants are typically sized to generate less than 20 MW, which is substantially less than the capacity of the 500 MW PEP project. At the peak of the biomass industry, 66 biomass plants were in operation in California, but as of 2001, only about 30 direct-combustion biomass facilities were in operation (CEC 2001d).

In order to generate 500 MW, twenty-five 20 MW biomass facilities would be required. These power plants would have potentially significant environmental impacts of their own.

Geothermal

Geothermal technologies use steam or high-temperature water (HTW) obtained from naturally occurring geothermal reservoirs to drive steam turbine/generators. There are vapor dominated resources (dry, super-heated steam) and liquid-dominated resources where various techniques are utilized to extract energy from the HTW. Geothermal is a commercially available technology, but is limited to areas where geologic conditions result in high subsurface temperatures (CEC, 2001e).

Hydropower

While hydropower does not require burning fossil fuels and may be available in California, this power source can cause significant environmental impacts, due primarily to the inundation of many acres of potentially valuable habitat and the interference with fish movements during their life cycles. In addition, planning and permitting time is on the order of 10 years. As a result, it is extremely unlikely that new large hydropower facilities could be developed and permitted in California within the next several years (Aspen 2001).

Conclusion Regarding Alternative Technologies

Alternative generation typically has specific resource needs, environmental impacts, permitting difficulties, and intermittent availability. Therefore, these technologies do not fulfill a basic objective of the proposed project to provide load-serving capability in order to ensure a reliable supply of electricity for California. Consequently, staff does not believe that these renewable technologies present feasible alternatives to the proposed project.

CONCLUSIONS

Staff does not consider alternative technologies (geothermal, solar, wind, biomass, and hydroelectric) to be feasible alternatives to the proposed project. While the No Project Alternative would eliminate all impacts of this project, the benefits of increasing in-state generation would also not be achieved and environmental impacts could be shifted to other power plant locations where impacts could be greater than those that would result from the construction and operation of the PEP.

The three site alternatives considered in this section offer a few advantages and several disadvantages in comparison to the proposed project. Similar to the proposed project, all the alternative sites would have the potential to cause significant air quality impacts because of the difficulty in creating emission reduction credits in the regional area. Therefore, no alternative site is recommended over the proposed project.

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GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Connie Bruins

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in compliance with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

1. The Compliance Plan is composed of elements that:
   - set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
   - set forth the requirements for handling confidential records and maintaining the compliance record;
   - state procedures for settling disputes and making post-certification changes;
   - state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions;
   - establish requirements for facility closure plans.
   - specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

SITE MOBILIZATION

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for construction utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the

portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is, therefore, not considered construction.

GROUND DISTURBANCE

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

GRADING

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

CONSTRUCTION

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

- the installation of environmental monitoring equipment;
- a soil or geological investigation;
- a topographical survey;
- any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; or
- any work to provide access to the site for any of the purposes specified in a., b., c., or d.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, “commercial operation” is that phase of project development which begins after the completion of start-up and commissioning, where the power plant has reached steady-state production of electricity with reliability at the rated capacity. For example, at the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

A Compliance Project Manager (CPM) will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Energy Commission Decision;
2. resolving complaints;
3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and

5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval the approval will involve all appropriate staff and management.

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy Commission about power plant construction or operation-related questions, complaints or concerns.

Pre-Construction and Pre-Operation Compliance Meeting

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

Energy Commission Record

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

- all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- all monthly and annual compliance reports filed by the project owner;
- all complaints of noncompliance filed with the Energy Commission; and
- all petitions for project or condition changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate. A summary of the General Conditions of Certification is included as **Compliance Table 1**

at the conclusion of this section. The designation after each of the following summaries of the General Compliance Conditions (**Com-1, Com-2,** etc.) refers to the specific General Compliance Condition contained in **Compliance Table 1.**

Access, Compliance Condition of Certification, COM-1

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

Compliance Record, COM-2

The project owner shall maintain project files onsite or at an alternative site approved by the CPM, for the life of the project unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all "as-built" drawings, all documents submitted as verification for conditions, and all other project-related documents.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

Compliance Verification Submittals, COM-3

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission's procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
2. providing appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of mitigation or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal**. The project owner shall also identify those submittals **not** required by a condition of certification with

a statement such as: “This submittal is for information only and is not required by a specific condition of certification.” When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

Compliance Reporting, COM-5 and COM-6

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix, COM-5 and COM-6

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable;
7. the compliance status of each condition (e.g., “not started,” “in progress” or “completed” (include the date); and

8. the project's preconstruction and construction milestones, including dates and status.

Satisfied conditions do not need to be included in the compliance matrix after they have been identified as satisfied in at least one monthly or annual compliance report.

Pre-Construction Matrix, COM-4

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's **first** compliance submittal or prior to the first pre-construction meeting, whichever comes first. It will be in the same format as the compliance matrix referenced above.

Construction and Operation Security Plan, COM-7

Prior to commencing construction, a site-specific Security Plan for the construction phase shall be developed and maintained at the project site. Prior to commercial operation, a site-specific Security Plan for the operational phase shall be developed and maintained at the project site. The plans may be reviewed at the site by the CPM during compliance inspections.

Construction Security Plan

The Construction Security Plan must address:

1. site fencing enclosing the construction area;
2. use of security guards;
3. check-in procedure or tag system for construction personnel and visitors;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
5. evacuation procedures.

Operation Security Plan

The Operations Security Plan must address:

1. permanent site fencing and security gate;
2. use of security guards;
3. security alarm for critical structures;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. evacuation procedures;
6. perimeter breach detectors and on-site motion detectors;
7. video or still camera monitoring system; and
8. fire alarm monitoring system.

The CPM may authorize modifications to these measures, or may require additional measures depending on circumstances unique to the facility, and in response to industry-related security concerns.

Tasks Prior to Start of Construction, COM-4

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times (e.g., 30, 60, 90 days) for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project development.

Project owners frequently anticipate starting project construction as soon as the project is certified. In those cases, it may be necessary for the project owner to file compliance submittals prior to project certification if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change based upon the Final Decision

Monthly Compliance Report, COM-5

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification and preconstruction and construction milestones (fully satisfied conditions do not need to be included in the matrix after they have been reported as closed);

4. a list of conditions and milestones that have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification or milestones;
9. a listing of the month's additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.

Annual Compliance Report, COM-6

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file;
9. an evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section]; and

10. a listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved complaints, and the status of any unresolved complaints.
11. a listing of all outages planned for the coming year and a listing of all outages that occurred during the previous year, including the anticipated duration and the reason for each outage occurrence.

Confidential Information, COM-8

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, that 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, COM-9

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of $850. The payment instrument shall be provided to the Energy Commission's Project Manager (PM), not the CPM, at the time of project certification and shall be made payable to the California Department of Fish and Game. The PM 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, COM-10

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with date and time stamp recording. All recorded inquiries shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at:

http://www.energy.ca.gov/sitingcases/power_plants_contacts.html

Any changes to the telephone number shall be submitted immediately to the CPM who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form on page 11.

Facility Closure, COM-11 and COM-12

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although

the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unplanned temporary closure and unplanned permanent closure**.**

Closure Definitions

Planned Closure

A planned closure occurs 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.

Unplanned Temporary Closure

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

Unplanned Permanent Closure

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

GENERAL CONDITIONS FOR FACILITY CLOSURE

Planned Closure, COM-11

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.
The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;

2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

In the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure. In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Energy Commission approval of the facility closure plan is obtained.

Unplanned Temporary Closure/On-Site Contingency Plan, COM-12

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. (Also see

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: **Palomar Energy Project**
AFC Number: **01-AFC-24**

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.)

specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that an unplanned temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

Unplanned Permanent Closure/On-Site Contingency Plan, COM-12

The on-site contingency plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan, consistent with the requirements for a planned closure, shall be developed and submitted to the CPM within 90 days of the permanent closure or another period of time agreed to by the CPM.

CBO Delegation and Agency Cooperation

In performing construction and operation monitoring of the project, Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Commission staff retains CBO authority when selecting a delegate CBO including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental control when conducting project monitoring.

Enforcement

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider. Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

Noncompliance Complaint Procedures

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

Informal Dispute Resolution Procedure

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

Request for Informal Investigation

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within 48 hours, followed by a written report filed within seven days.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and
4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Energy Commission shall have the authority to consider all relevant facts involved

and make any appropriate orders consistent with its jurisdiction (Cal. Code Regs., tit 20, §§ 1232-1236).

POST CERTIFICATION CHANGES TO THE ENERGY COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES, COM-13

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Energy Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of change process applies are explained below.

Amendment

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol, or in some cases the verification portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

Insignificant Poject 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

As provided in Title 20, Section 1770 (d), California Code of Regulations, a verification may be modified by staff without requesting an amendment to the decision if the change does not conflict with the conditions of certification.

KEY EVENTS LIST, COM-6

PROJECT: **Palomar Energy Project**

DOCKET #: 01-AFC-24

COMPLIANCE PROJECT MANAGER:

EVENT DESCRIPTION	**DATE**
Certification Date/Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
SYNCHRONIZATION WITH GRID AND INTERCONNECTION	
COMPLETE T/L CONSTRUCTION	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
COMPLETE GAS PIPELINE CONSTRUCTION	
WATER SUPPLY LINE ACTIVITIES	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

TABLE 1
COMPLIANCE SECTION
SUMMARY of GENERAL CONDITIONS OF CERTIFICATION

CONDITION NUMBER	PAGE #	SUBJECT	DESCRIPTION
COM-1	4	Access	**The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.**
COM-2	4	Compliance Record	**The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.**
COM-3	4	Compliance Verification Submittals	**The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed or the project owner or his agent.**
COM-4	6, 7	Preconstruction Submittals	**Construction shall not commence until the all of the following activities/submittals have been completed:** **property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns,** **a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction,** **all pre-construction conditions have been complied with,** **the CPM has issued a letter to the project owner authorizing construction.**
COM-5	5, 6, 7	Compliance Reporting During Construction: Monthly Compliance Reports	**During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.**

CONDITION NUMBER	PAGE #	SUBJECT	DESCRIPTION
COM-6	5, 8	COMPLIANCE REPORTING DURING OPERATION: ANNUAL COMPLIANCE REPORTS	**After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports (ACRs) which include specific information. The first ACR is due after the air district has issued a Permit to Operate.**
COM-7	6	SECURITY PLANS	**Prior to commencing construction, the project owner shall submit a Construction Security Plan. Prior to commencing operation, the project owner shall submit an Operation Security Plan.**
COM-8	9	CONFIDENTIAL INFORMATION	**Any information the project owner deems confidential shall be submitted to the Commission's Dockets Unit.**
COM-9	9	DEPT OF FISH AND GAME FILING FEE	**The project owner shall pay a filing fee of $850 at the time of project certification.**
COM-10	9	REPORTING OF COMPLAINTS, NOTICES AND CITATIONS	**Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.**
COM-11	10, 11	PLANNED FACILITY CLOSURE	**The project owner shall submit a closure plan to the CPM at least twelve months prior to commencement of a planned closure.**
COM-12	10, 13, 14	UNPLANNED FACILITY CLOSURE	**To ensure that public health and safety and the environment are protected in the event of an unplanned closure (either temporary or permanent) the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.**
COM-13	16	POST-CERTIFICATION CHANGES TO THE DECISION	**The project owner must petition the Energy Commission to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of operational control of the facility.**

PALOMAR ENERGY PROJECT
PREPARATION TEAM

Executive Summary ..... Bob Eller

Introduction ..... Bob Eller

Project Description ..... Bob Eller

Air Quality ..... Brewster Birdsall

Biological Resources ..... Bruce Barnett and Rick York

Cultural Resources ..... Roger Mason

Hazardous Materials ..... Alvin J. Greenberg, Ph.D. And Rick Tyler

Land Use ..... Amanda Stennick

Noise and Vibration ..... Jim Buntin

Public Health ..... Alvin J. Greenberg, Ph.D.

Socioeconomics ..... James Adams

Soil and Water ..... Joe Crea and Richard Latteri

Traffic and Transportation ..... Steven J. Brown, P.E.

Transmission Line Safety and Nuisance ..... Obed Odoemelam, Ph.D.

Visual Resources ..... Michael Clayton and Will Walters

Waste Management ..... Alvin Greenberg, Ph.D.

Worker Safety and Fire Protection ..... Alvin J. Greenberg, Ph.D. and Rick Tyler

Facility Design ..... Shahab Khoshmashrab, Al McCuen and Steve Baker

Geology and Paleontology ..... Dal Hunter, Ph.D., C.E.G.

Power Plant Efficiency ..... Kevin Robinson and Steve Baker

Power Plant Reliability ..... Kevin Robinson and Steve Baker

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Project Assistant ..... Keith A. Muntz

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