Staff Assessment

ALMOND 2 POWER PLANT PROJECT

Application For Certification (09-AFC-2)
Stanislaus County

CALIFORNIA ENERGY COMMISSION

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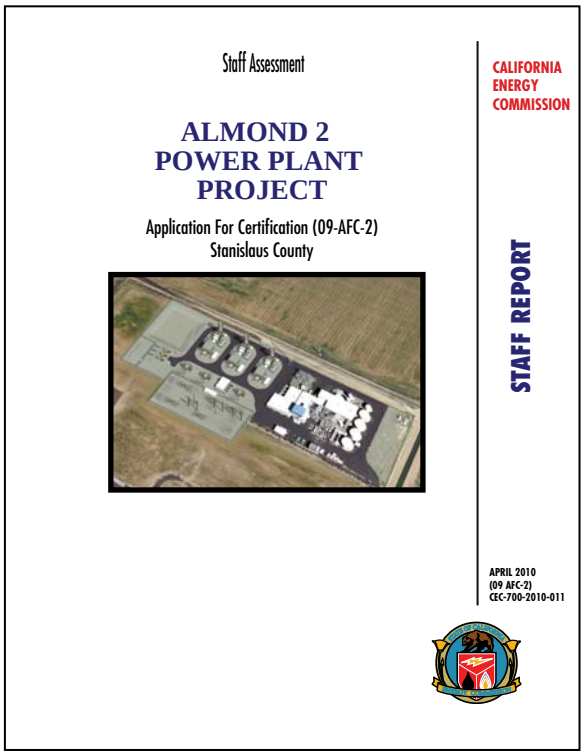

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ALMOND 2 POWER PLANT
(09-AFC-2)
STAFF ASSESSMENT

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INTRODUCTION

The Staff Assessment (SA) contains the California Energy Commission staff's independent analysis and final recommendations on the Almond 2 Power Plant Project (A2PP). The proposed project is under the Energy Commission's jurisdiction and cannot be constructed or operated without the Energy Commission's certification. This SA examines engineering, environmental, public health and safety aspects of the proposed project. The SA analysis is based on the information provided by the applicant and other sources available at the time the analysis was prepared and contains analyses similar to those normally contained in an Environmental Impact Report required by the California Environmental Quality Act. When issuing a certificate, the Energy Commission is the lead state agency under the California Environmental Quality Act and its process is functionally equivalent to the preparation of an Environmental Impact Report.

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 to all applicable laws, ordinances, regulations and standards. The staff also recommends conditions of certification to mitigate potentially significant adverse environmental effects and conditions for construction, operation and eventual closure of the project if approved by the Energy Commission. This SA is not a decision document for these proceedings, nor does it contain findings by the Energy Commission; it is a staff recommendation related to environmental and public health and safety impacts and the project's compliance with local, state and federal laws, ordinances, regulations and standards.

The SA will serve as staff's testimony in evidentiary hearings to be held by a 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, government agencies, all parties and the public prior to proposing its decision. The Energy Commission will make findings and provide a final decision after the Committee's publication and consideration of comments on its Presiding Member's Proposed Decision.

The analyses contained in this SA are based upon information from: 1) the Application for Certification; 2) subsequent supplements; 3) workshops and site visits; 4) responses to data requests, additional information from federal, state and local agencies; 5) existing documents and publications; 6) independent research; and 7) public comments.

PROJECT LOCATION AND DESCRIPTION

The project is located at 4500 Crows Landing Road, Modesto, California in the county of Stanislaus approximately 2 miles from the Ceres city center and 5 miles south of Modesto, in Stanislaus County. Although the site address identifies the project in Modesto, the project site is located within the city limits of Ceres.

The project will occupy a 4.6-acre site, adjacent to the existing 48-MW TID Almond Power Plant (A1PP).The project site is bordered by the A1PP to the south, a WinCo distribution warehouse to the west, a farm supply facility to the north, and various industrial facilities to the east. The site is zoned for industrial use and is approximately 0.3 miles south of the nearest residential uses with several industrial buildings located nearby. The project site was previously used as a borrow pit and was filled and graded in 2008.

The following are the major components of the power plant: three GE EnergyLM6000 PG combustion turbine generators (CTGs) equipped with evaporative cooling and GE's SPRay-INTercooled (SPRINT) power augmentation; 115-kilovolt (kV) switchyard; two 115-kV transmission line corridors; corridor 1 is approximately 0.9 miles long, and corridor 2 is approximately 1.2 miles long; reconductoring of approximately 2.9 miles of an existing 6.9 miles of an existing 69-kV sub-transmission line to enhance system reliability; natural gas pipeline approximately 11.6 miles long.

TID would be a common owner and operator of the existing A1PP and the proposed A2PP, therefore some existing facilities would be shared between the two plants, as follows: anhydrous ammonia system, including the 12,000 gallon storage and unloading facilities; fire protection system, including fire water storage tank and diesel-fired emergency fire pump; well water for service water and emergency shower/eyewash stations; water treatment system; recycled water supply and wastewater discharge system; instrument and service air systems; oil/water separator; demineralized and reverse osmosis water storage tanks; administration building, including the control room and office space. A more complete description of the project that includes site layout and regional maps is contained in the **PROJECT DESCRIPTION** section of this Staff Assessment.

PUBLIC AND AGENCY COORDINATION

Prior to the publication of the SA, the Energy Commission conducted a publicly noticed business meeting at which it accepted the A2PP Application for Certification as complete and allowed comments on the proposed project. Staff sent notices informing property owners, libraries and agencies of the proposed project and sent copies of the Application for Certification to libraries, agencies and organizations. The Committee of two Commissioners assigned to oversee the A2PP proceeding conducted an Informational Hearing, Issues Identification and Scheduling Conference on July 30, 2009 in Ceres, CA.

Staff conducted a publicly noticed Data Response and Issue Resolution Workshop in Sacramento on September 22, 2009. The workshop allowed staff and the applicant to discuss data requests, data responses, and resolve issues. Additionally, the workshop provided opportunities to hear opinions on the project and the proceeding from interested agencies, and members of the public. Staff also has coordinated directly with relevant local, state and federal agencies including the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, State Water Resources Control Board/Regional Water Quality Control Board, California Department

of Fish and Game, and California Air Resources Board. Additionally, the Energy Commission works closely with local air and water districts and building and planning departments to include local government officials.

ENVIRONMENTAL JUSTICE

The steps recommended by the U.S. EPA's guidance documents to assure compliance with the Executive Order 12898 regarding environmental justice are: (1) outreach and involvement; (2) a screening-level analysis to determine the existence of a minority or low-income population; and (3) if warranted, a detailed examination of the distribution of impacts on segments of the population. Though the Federal Executive Order and guidance are not binding on the Energy Commission, staff finds these recommendations helpful for implementing its environmental justice analysis. Staff has followed each of the above steps for the following 11 sections in the SA: Air Quality, Hazardous Materials, Land Use, Noise, Public Health, Socioeconomics, Soils and Water, Traffic and Transportation, Transmission Line Safety/Nuisance, Visual Resources, and Waste Management.

The purpose of staff's environmental justice screening analysis is to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in USEPA's National Environmental Protection Act Compliance Analysis" (Guidance Document) dated April 1998. People of color populations, as defined by this Guidance Document, are identified where either:

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

Staff has reviewed Year 2000 U.S. Census block data for the proposed project site which indicates 22% low-income, which does not exceed staff's screening threshold of greater than 50% within a six-mile radius of the proposed project site and a minority population of 55%, which does exceed staff's screening threshold of greater than 50% within a six-mile radius of the proposed project site. Over the course of the analysis for each of the 11 areas identified above, staff considered potential impacts and mitigation measures, significance, and determined that there would be no disproportionate impact on an environmental justice population. (**See Socioeconomics Figure 1**).

STAFF'S ASSESSMENT

Each technical area section of the Staff Assessment contains a discussion of impacts, and where appropriate, mitigation measures and conditions of certification. The Staff Assessment 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

alternatives; compliance of the project with applicable laws, ordinances, regulations and standards during construction and operation; proposed conditions of certification; and project closure.

OVERVIEW OF STAFF'S CONCLUSIONS

Staff's analysis indicates that the project's impacts in all areas would be mitigated to levels that are less than significant. Staff believes that as currently proposed, including the applicant's and the staff's proposed mitigation measures and the staff's proposed conditions of certification, the Almond 2 Power Project does comply with all applicable laws, ordinances, regulations, and standards (LORS).

Technical Sections Status Table

Technical Discipline	Impacts Mitigated	Complies with LORS
Air Quality	x	x
Alternatives	x	x
Biological Resources	x	x
Cultural Resources	x	x
Efficiency	x	x
Facility Design	x	x
Geology, and Paleontological Resources	x	x
Hazardous Materials	x	x
Land Use	x	x
Noise and Vibration	x	x
Public Health	x	x
Reliability	x	x
Socioeconomics	x	x
Soil and Water Resources	x	x
Traffic and Transportation	x	x
Transmission Line Safety/Nuisance	x	x
Transmission System Engineering	x	x
Visual Resources	x	x
Waste Management	x	x
Worker Safety/Fire Protection	x	x

CONCLUSIONS

The SA is staff's testimony for the A2PP, and as such, is part of the overall project discovery process and suggests resolution of issues identified in this document. Each technical area assessment in the SA includes a discussion of the project and the existing environmental setting; the project's conformance with laws, ordinances, regulations and standards (LORS); whether the facility can be constructed and operated safely and reliably; project specific direct and cumulative impacts; the environmental consequences of the project using the proposed mitigation measures; conclusions and recommendations; and any proposed conditions of certification under which the project should be constructed and operated, should it be approved.

The suggested resolution of the issues discussed in this document are a result of workshops, agreements between the applicant and appropriate agencies, comments received by involved parties and staff's professional opinions.

Staff's analysis indicates that A2PP can be built with no significant unmitigated impacts, and would be in conformance with all laws, ordinances, regulations and standards.

INTRODUCTION

Felicia Miller

PURPOSE OF THIS REPORT

The Staff Assessment (SA) presents the California Energy Commission (Energy Commission) staff's independent analysis of the Almond 2 Power Plant (A2PP or Applicant), Application for Certification (AFC). The SA is a staff document. It is neither a Committee document nor a draft Energy Commission decision. The Committee is comprised of two commissioners who have been assigned to the project to oversee the proceeding. The SA describes the following:

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

The analyses contained in this SA are based upon information from the AFC, supplemental information from the applicant, responses to data requests, comments and recommendations from local and state agencies, existing documents and publications, and independent field studies and research. The SA presents conclusions and proposed conditions of certification that apply to the design, construction, operation, and closure of the proposed facility. The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of verification. The verification is not part of the proposed condition, but is the Energy Commission Compliance Unit's method of ensuring post-certification compliance with adopted requirements.

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

ORGANIZATION OF THE STAFF ASSESSMENT

The SA contains an Executive Summary, Introduction, Project Description, Project Analysis, 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: air quality, biological resources, cultural resources, geological and paleontological resources, hazardous material management, land use, noise and vibration, public health, socioeconomics, soil and water resources, worker safety and fire protection, transmission line safety, waste management, traffic and transportation, visual resources, facility design, power plant reliability, power plant efficiency, and transmission system engineering. A discussion of facility closure, project construction and operation compliance monitoring plans, and a list of staff that assisted in preparing this report follow the chapters.

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

- laws, ordinances, regulations, and standards;
- 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 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 impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws or 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 contained 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 shall be presented in a 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 Natural Resources Agency (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit.14, §15251 [k]). The Energy Commission is the CEQA lead agency and is subject to all other portions of CEQA.

Staff typically prepares both a preliminary and final staff assessment. However, to adhere to agreed upon timelines for this project, staff will prepare a SA only. The SA presents for the Applicant, intervenors, agencies, other interested parties, and members of the public, the staff's final analysis, conclusions, and recommendations.

Staff uses the SA to resolve issues between the parties and to narrow the scope of any adjudicated issues in the evidentiary hearings. After publication of the SA, staff will conduct a workshop to discuss its findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshop and written comments, staff will submit final conditions of certification to reflect areas where the parties have reached agreement in a joint stipulation document.

The staff's SA is only one piece of evidence that the Committee will consider 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 provides a forum for the Committee to receive comments from the public and other governmental agencies.

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

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the SA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. The Energy Commission staff's implementation of the plan ensures that a certified

facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. Staff's proposed Compliance Monitoring Plan and General Conditions are included at the end of this PSA.

AGENCY COORDINATION

As noted above, the Energy Commission's 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 Energy Commission typically seeks comments from and works closely with other regulatory agencies that administer laws, ordinances, regulations, and standards that may be applicable to proposed projects. These agencies include the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, State Water Resources Control Board/Regional Water Quality Control Board, California Department of Fish and Game, and California Air Resources Board. Additionally, the Energy Commission works closely with local air and water districts and building and planning departments to include local government officials.

PROJECT DESCRIPTION

Felicia Miller

INTRODUCTION

On May 11, 2009, Turlock Irrigation District (TID or Applicant), filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to develop the Almond 2 Power Plant (A2PP). On July 1, 2009, the Energy Commission accepted the AFC as complete, thus starting the Energy Commission's formal review of the proposed project.

PURPOSE OF PROJECT

The A2PP would provide electric generation capacity with increased efficiency and operational flexibility. The three new generation units would assist TID in meeting its balancing authority obligations by providing operating reserves to increase system-wide reliability and address TID's growing load by meeting the demands within TID's service territory.

PROJECT LOCATION

The project is located at 4500 Crows Landing Road, Modesto, California in the county of Stanislaus approximately 2 miles from the Ceres city center and 5 miles south of Modesto. Although the site address identifies the project in Modesto, the project site is located within the city limits of Ceres.

The project will occupy a 4.6-acre site, adjacent to the existing 48-MW TID Almond Power Plant (A1PP).The project site is bordered by the A1PP to the south, a WinCo distribution warehouse to the west, a farm supply facility to the north, and various industrial facilities to the east. The site is zoned for industrial use approximately 0.3 miles south of the nearest residential uses, with several industrial buildings located nearby. The project site was previously used as a borrow pit and was filled and graded in 2008. (**PROJECT DESCRIPTION Figure 1**).

POWER PLANT EQUIPMENT AND LINEAR FACILITIES

The proposed A2PP will be a natural-gas-fired, simple-cycle peaking facility rated at a gross generating capacity of 174 megawatts (MW) and designed to provide TID with operating reserves. Primary equipment for the generating facility would include three 58-MW General Electric LM6000PG turbines equipped with a water injection system to the turbine in order to reduce nitrogen oxide (NOx) formation, and a selective catalytic reduction system (SCR) to further control NOx emissions. Power will be transmitted to the grid at 115 kilovolts (kV) through two proposed new transmission lines which will connect to the proposed TID Grayson Substation, to be located approximately 3,300 feet from A2PP. The substation is expected to be complete before the A2PP project is operational and is not part of the A2PP project. Existing facilities at the adjacent A1PP will be shared with the A2PP facility without modification. A2PP will receive process

water from the Ceres Wastewater Treatment Plant (CWTP) through an existing pipeline at A1PP, as well as service water for domestic use provided by an existing onsite water well. Expansion of the existing natural gas service would be required for the proposed project. PG&E will construct an approximately 11.6-mile long natural gas pipeline to their supply line from the A2PP site.

The following are the major components of the power plant:

- three GE EnergyLM6000 PG combustion turbine generators (CTGs) equipped with evaporative cooling and GE's SPRay-INTercooled (SPRINT) power augmentation,
- 115-kilovolt (kV) switchyard,
- two 115-kV transmission line corridors; corridor 1 is approximately 0.9 miles long, and corridor 2 is approximately 1.2 miles long,
- reconductoring of approximately 2.9 miles of an existing 6.9 miles of an existing 69-kV sub-transmission line to enhance system reliability,
- natural gas pipeline approximately 11.6 miles long.

TID would be a common owner and operator of the existing A1PP and the proposed A2PP, therefore some existing facilities would be shared between the two plants, as follows:

- anhydrous ammonia system, including the 12,000 gallon storage and unloading facilities,
- fire protection system, including fire water storage tank and diesel-fired emergency fire pump,
- well water for service water and emergency shower/eyewash stations,
- water treatment system,
- recycled water supply and wastewater discharge system,
- instrument and service air systems,
- oil/water separator,
- demineralized and reverse osmosis water storage tanks,
- administration building, including the control room and office space.

NATURAL GAS SUPPLY

Natural gas would be supplied to the A2PP from existing and new pipelines constructed and owned by PG&E. The new Preferred Alignment is approximately 11.6-miles long and will run alongside paved roads, farm roads, and through agricultural fields. In addition, PG&E will reinforce a 1.8-mile long existing pipeline segment along the western side of the San Joaquin River. All pipelines will be installed underground, with trenchless construction under several water crossings. (**PROJECT DESCRIPTION Figure 2**).

WATER SUPPLY

The A2PP will use approximately 293 acre-feet of process water per year, assuming typical expected operation of 5,000 hours per year (about 57% capacity factor). A2PP will share service water by tying into existing onsite water well located in the southeast corner of the existing A1PP site. Drinking water will be provided by an outside drinking water delivery service. Fire water will tie into the existing A1PP fire system. The A2PP project receives process water that is currently delivered to the site by an existing 6-inch diameter pipeline between the A1PP and the CWTP for water.

WASTEWATER AND STORM WATER DISCHARGE

The process wastewater collection system will collect process wastewater in a sump and pump it to the existing wastewater tank. Reverse osmosis reject and wastewater from backwashing the reverse osmosis media also go to the wastewater trench. From there it is returned to the wastewater treatment plant through an existing pipeline. Stormwater runoff will be routed to a new onsite retention pond located on the north side of the project site.

HAZARDOUS WASTE

Hazardous wastes generated by A2PP would be managed and disposed using several methods. Waste lubricating oil will be recovered and recycled by a waste oil recycling contractor. Spent lubrication oil filters will be disposed of in a Class 1 landfill. Spent SCR and oxidation catalysts will be recycled by the supplier or disposed of in accordance with regulatory requirements.

TRANSMISSION SYSTEM

Power will be transmitted to the grid at 115 kilovolts (kV) through two new proposed transmission lines which will connect to the proposed TID Grayson Substation, which will be located approximately 3,300 feet from A2PP. Corridor 1 is 0.9 miles long; Corridor 2, 1.2 miles long. In addition, an existing 2.9-mile long 69 kV sub-transmission line will be reconductored to prevent possible thermal overloads.

The proposed Grayson substation consists of an approximately 10-mile long 115 kV transmission line, a 0.5-mile long 69 kV transmission line from the existing TID A1PP and a second 69 kV double-circuit transmission line that extends 0.8 mile east from the proposed substation. The Grayson substation and linears are part of the Hughson-Grayson115-kV Transmission Line and Substation Project and are not part of the A2PP project. The substation and linears are expected to be complete before the A2PP project is operational.

PROJECT CONSTRUCTION AND OPERATION

If approved by the Energy Commission, TID proposes to initiate construction of the A2PP in the fourth quarter of 2010, provided there are no delays. The construction period is expected to last approximately 12 months, with scheduled commercial operations beginning in the fourth quarter of 2011. The on-site construction workforce would peak at approximately 149 workers, and average 96 workers over the construction period. Construction hours will typically occur between 7 a.m. and 3:30 p.m. on weekdays,

however additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities. Operation and maintenance of the A2PP will require 16 full-time permanent staff. Construction costs are estimated to be approximately $175 million.

Primary construction access would be from SR 99 to Crows Landing Road. The project site is approximately 4.6 acres, with a 1.85-acre construction laydown and parking area adjacent to the northern border of the construction site located on the WinCo property.

REFERENCES

TID2009a –Turlock Irrigation District/ R. Baysinger (tn: 51502). Application for Certification, Volume 1& 2. Dated 5/11/09. Submitted to CEC/Docket Unit on 5/11/09.

PROJECT DESCRIPTION - FIGURE 1

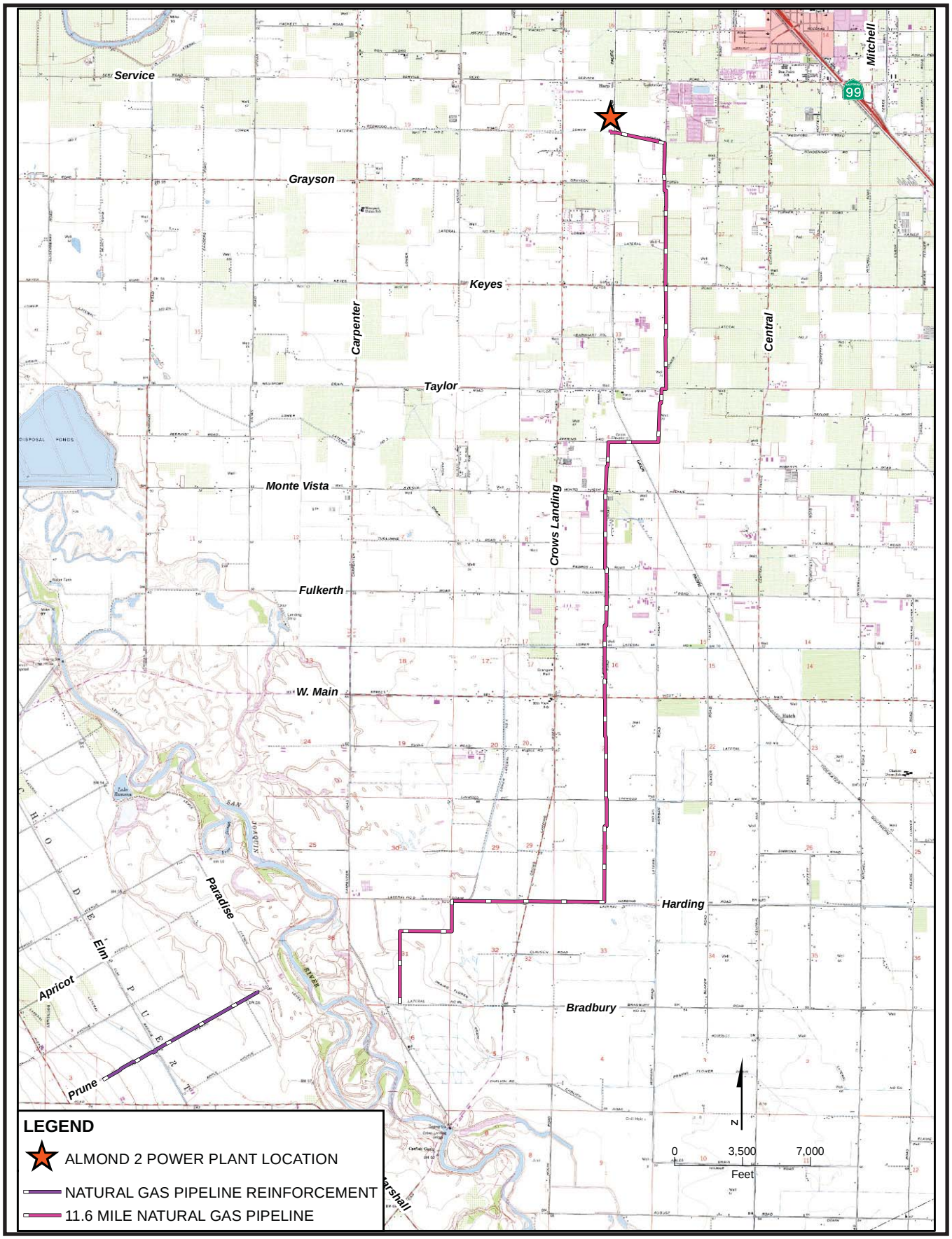
Almond 2 Power Plant Project - Architectural Rendering

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Executive Summary Figure 1.1-1

PROJECT DESCRIPTION - FIGURE 2

Almond 2 Power Plant Project - Preferred Alignment



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: CH2MHill

ENVIRONMENTAL ASSESSMENT

AIR QUALITY

Testimony of Tao Jiang and Brewster Birdsall, P.E., QEP

SUMMARY OF CONCLUSIONS

Staff finds that with the adoption of the attached conditions of certification, the proposed Almond 2 Power Plant (A2PP) would not result in significant air quality related impacts and that the A2PP would likely conform with applicable federal, state and San Joaquin Valley Air Pollution Control District (SJVAPCD or District) air quality laws, ordinances, regulations, and standards (LORS).

Staff finds that mitigation would be provided in the form of emission reduction credits (ERCs) as required by SJVAPCD rules, to fully offset all nonattainment pollutants and their precursors at a minimum ratio of one-to-one and to reduce the potential impacts of the proposed project to less than significant.

Global climate change and greenhouse gas emissions from the project are discussed and analyzed in **AIR QUALITY APPENDIX AIR-1**. The A2PP would emit approximately 0.51 metric tonnes of carbon dioxide per megawatt hour (MTCO2/MWh). The project would not be subject to the emission limits established by SB 1368 (Perata, Chapter 598, Statutes of 2006), known as the greenhouse gas Emission Performance Standard, because A2PP is not designed or intended for base load generation [Tit. 20, Cal. Code Regs., § 2901 (b)]. Mandatory reporting of the GHG emissions would occur while the Air Resources Board develops greenhouse gas regulations and/or trading markets. The project may be subject to GHG reduction or trading requirements as the GHG regulations become more fully developed and implemented.

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants from both the construction and operation of the proposed A2PP project. The new A2PP will be constructed adjacent to the existing 48-MW Turlock Irrigation District (TID) Almond Power Plant (APP) located in Ceres, Stainslaus County, California.

Criteria air pollutants are defined as air contaminants for which the state and/or federal government has established an ambient air quality standard to protect public health. The criteria pollutants analyzed are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), inhalable particulate matter (PM10), and fine particulate matter (PM2.5). In addition, Nitrogen oxides (NOx, consisting primarily of nitric oxide (NO) and NO_2), sulfur oxides (SOx) and volatile organic compounds (VOC) are also analyzed. NOx and VOC readily react in the atmosphere as precursors to ozone. NOx and SOx readily react in the atmosphere to form particular matter. Sulfur oxides (SOx) readily react in the atmosphere to form particulate matter and are major contributors to acid rain. Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in the context of cumulative impacts (**AIR QUALITY APPENDIX AIR-1**).

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

- Whether the A2PP is likely to conform with applicable federal, state, and SJVAPCD air quality laws, ordinances, regulations and standards (Title 20, California Code of Regulations, section 1744 (b));
- Whether the A2PP is likely to cause significant air quality impacts, including new violations of ambient air quality standards or substantial contributions to existing violations of those standards (Title 20, California Code of Regulations, section 1743); and
- Whether the mitigation measures proposed for the project are adequate to lessen the potential impacts to a level of insignificance (Title 20, California Code of Regulations, section 1742 (b)).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws, ordinances, regulations, and standards (LORS) and policies pertain to the control of criteria pollutant emissions and the mitigation of air quality impacts. Staff's analysis examines the project's compliance with these requirements, as in **Air Quality Table 1**.

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

Applicable Law	Description
Federal	**U.S. Environmental Protection Agency**
Federal Clean Air Act Amendments of 1990, Title 40 Code of Federal Regulations (CFR) Part 50	National Ambient Air Quality Standards (NAAQS).
Clean Air Act (CAA) § 160-169A and implementing regulations, Title 42 United State Code (USC) §7470-7491 40 CFR 51 & 52 (Prevention of Significant Deterioration Program)	Requires prevention of significant deterioration (PSD) review and facility permitting for construction of new or modified major stationary sources of pollutants that occur at ambient concentrations attaining the NAAQS. A PSD permit would not be required for the proposed A2PP project because it would not exceed 100 tons per year of NO_2, CO, or PM10. The PSD program is within the jurisdiction of the U.S. EPA.
CAA §171-193, 42 USC §7501 et seq. (New Source Review)	Requires new source review (NSR) facility permitting for construction or modification of specified stationary sources. NSR applies to sources of designated nonattainment pollutants. This requirement is addressed through SJVAPCD Rule 2201.
40 CFR 60, Subpart KKKK	Standards of Performance for Stationary Combustion Turbines, New Source Performance Standard (NSPS). Requires the proposed simple-cycle system to achieve 25 parts per million (ppm) NOx and achieve fuel sulfur standards.
CAA §401 (Title IV), 42 USC §7651(Acid Rain Program)	Requires reductions in NOx and SO_2 emissions, implemented through the Title V program. This program is within the jurisdiction of the SJVAPCD with U.S. EPA oversight [SJVAPCD Rule 2540].
CAA §501 (Title V), 42 USC §7661(Federal Operating Permits Program)	Establishes comprehensive federal operating permit program for major stationary sources. Application required within one year following start of operation. This program is within the jurisdiction of the SJVAPCD with U.S. EPA oversight [SJVAPCD Rule 2520].
State	**California Air Resources Board and Energy Commission**
California Health & Safety Code	Prohibits discharge of such quantities of air contaminants that

Applicable Law	Description
(H&SC) §41700 (Nuisance Regulation)	cause injury, detriment, nuisance, or annoyance.
H&SC §40910-40930	Permitting of source needs to be consistent with approved clean air plan. The SJVAPCD New Source Review program is consistent with regional air quality management plans.
California Public Resources Code §25523(a); 20 CCR §1752, 2300-2309 (CEC & CARB Memorandum of Understanding)	Requires that Energy Commission decision on AFC include requirements to assure protection of environmental quality.
California Code of Regulations for Off-Road Diesel-Fueled Fleets (13 CCR §2449, et seq.)	General Requirements for In-Use Off-Road Diesel-Fueled Fleets – Requires owners and operators of in-use (existing) off-road diesel equipment and vehicles to begin reporting fleet characteristics to CARB in 2009 and meet fleet emissions targets for diesel particulate matter and NOx in 2010.
Airborne Toxic Control Measure for Idling (ATCM, 13 CCR §2485)	ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling – Generally prohibits idling longer than five minutes for diesel-fueled commercial motor vehicles.
Local	**San Joaquin Valley Air Pollution Control District**
SJVAPCD Rule 2201 (New and Modified Stationary Sources)	Establishes the pre-construction review requirements for new, modified or relocated emission sources, in conformance with NSR to ensure that these facilities do not interfere with progress in attainment of the ambient air quality standards and that future economic growth in the San Joaquin Valley is not unnecessarily restricted. Establishes the requirement to prepare a Preliminary Determination of Compliance (PDOC) and Final Determination of Compliance (FDOC) during SJVAPCD review of an application for a power plant. This regulation establishes Best Available Control Technology (BACT) and emission offset requirements. The A2PP project net emission increase of NOx would exceed the federal major modification threshold (40 CFR 51.165). The SJVAPCD classifies the project as a Federal Major Modification for NOx, and public notification requirements are triggered (SJVAPCD2010).
SJVAPCD Rule 2520 (Federally Mandated Operating Permits)	Establishes the permit application and compliance requirements for the federal Title V federal permit program. A2PP must submit an application to modify the existing Title V permit.
SJVAPCD Rule 2540 (Acid Rain Program)	Implements the federal Title IV Acid Rain Program, which requires subject facilities to obtain emission allowances for SOx emissions and requires fuel sampling and/or continuous monitoring to determine SOx and NOx emissions.
SJVAPCD Regulation IV (Prohibitions)	Sets forth the restrictions for visible emissions, odor nuisance, various air emissions, and fuel contaminants. Regulation IV incorporates the NSPS provisions of 40 CFR 60, including standards for stationary combustion turbines (Subpart KKKK). These rules limit emissions of NOx, VOC, CO, particulate matter, and sulfur compounds.
SJVAPCD Rule 4703 (Stationary Gas Turbines)	Limits the proposed stationary gas turbine emissions of NOx to 5 ppmv over a 3-hour averaging period and CO to 25 ppmv. Provided certain demonstrations are made, the emission limits do not apply during startup, shutdown, or reduced load periods (defined as “transitional operation periods”).
SJVAPCD Regulation VIII (Fugitive PM10 Prohibition)	Requires control of fugitive PM10 emissions from various sources.

SETTING

METEOROLOGICAL CONDITIONS

The climate in California is typically dominated by the eastern Pacific high pressure system centered off the coast of California. In the summer, this system results in low inversion layers and clear skies inland and typically early morning fog by the coast. In winter, this system promotes wind and rainstorms originating in the Gulf of Alaska and striking Northern California.

The climate of the San Joaquin Valley is characterized by hot dry summers and mild winters with precipitation almost exclusively in the winter. Very little precipitation occurs during the summer months because the Pacific high pressure blocks migrating storm systems. Beginning in the fall and continuing through the winter, the storm belt and zone of strong westerly winds begins to greatly influence California. Temperature, winds, and rainfall are variable during fall and winter months, and stagnant conditions occur more frequently than during summer.

Wind speeds are generally higher in summer than in winter and are typically north-northwesterly winds. During the spring, summer, and fall, the stronger winds are caused by a combination of offshore and thermal low pressure resulting from high temperatures in the Central Valley. During the winter months, winds are more variable and are predominantly northerly. Calm conditions occur more during winter, but are relatively infrequent throughout the year. Valley fog often occurs during these calm, stagnant atmospheric conditions, when temperature inversions trap a layer of cool, moist air near the surface. The annual average rainfall at the project site is 12.2 inches and most precipitation (80%) occurs during November through March. Long-term average temperature and precipitation data from the nearest meteorological station located in Modesto, approximately 5 miles east-northeast of the project site, indicates that July is the warmest month of the year, with a normal daily maximum and minimum of 94.3°F and 59.9°F. In the winter, January is the coldest month of the year, with an average daily maximum and minimum of 53.8°F and 37.6°F (WRCC 2009).

Along with the wind flow, atmospheric stability and mixing heights are important factors in the determination of pollutant dispersion. Atmospheric stability is an indicator of the air turbulence and mixing. During the daylight hours of the summer when the earth is heated and air rises, there is more turbulence, more mixing, and thus less stability. During these conditions there is more air pollutant dispersion and therefore usually 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.

AMBIENT AIR QUALITY STANDARDS

The United States Environmental Protection Agency (U.S. EPA) and the California Air Resource Board (ARB) have both established allowable maximum ambient concentrations of criteria air pollutants. These are based upon public health impacts and

are called ambient air quality standards. The California Ambient Air Quality Standards (CAAQS), established by ARB, are typically lower (more stringent) than the federally established National Ambient Air Quality Standards (NAAQS).

Ambient air quality standards are designed to protect people who are most susceptible to respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The ambient air quality standards are also set to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

Current state and federal air quality standards are listed in **Air Quality Table 2**. The averaging times for the various ambient air quality standards (the duration over which all measurements taken are averaged) range from one hour to one year. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per unit volume of air, in milligrams (mg or 10^{-3} g) or micrograms (µg or 10^{-6} g) of pollutant in a cubic meter (m^3) of ambient air, drawn over the applicable averaging period.

AIR QUALITY Table 2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.075 ppm (147 µg/m^3)[a]	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual	0.053 ppm (100 µg/m^3)	0.03 ppm (57 µg/m^3)
	1 Hour	0.100 ppm [b]	0.18 ppm (339 µg/m^3)
Sulfur Dioxide (SO_2)	Annual	0.030 ppm (80 µg/m^3)	—
	24 Hour	0.14 ppm (365 µg/m^3)	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1300 µg/m^3)	—
	1 Hour	—	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM10)	Annual	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual	15 µg/m^3	12 µg/m^3
	24 Hour	35 µg/m^3	—
Sulfates (SO_4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

[a] On January 6, 2010, the U.S. EPA proposed to reduce the federal 8-hour ozone standard to 0.06 to 0.07 ppm.
[b] This new federal 1-hour NO_2 standard becomes effective April 12, 2010. The NO_2 NAAQS is based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations. Due to this regulation being promulgated after the A2PP application filing date, and due to a corresponding lack of guidance and modeling tools for conducting impact analyses and a lack of information regarding existing background concentrations, staff has not completed an impact assessment for compliance with this standard.

EXISTING AMBIENT AIR QUALITY

The federal and state attainment status of criteria pollutants in the San Joaquin Valley are summarized in **Air Quality Table 3**. Violations of federal and state ambient air quality standards for ozone, particulate matter, and CO have occurred historically throughout the region. Since the early 1970s, substantial progress has been made toward controlling these pollutants. Although air quality improvements have occurred, violations of standards for particulate matter and ozone persist.

The project site is located in Ceres, Stanislaus County. The operating monitoring station closest to the proposed site with long-term records of ozone, CO, PM10 and PM2.5 is Modesto-14th Street station. NO_2 was monitored at the Modesto-14th Street station and the Turlock-S Minaret Street station. SO_2 was monitored at the Bethel Island station.

AIR QUALITY Table 3
Attainment Status of San Joaquin Valley Air Pollution Control District

Pollutants	Attainment Status	
	Federal Classification	**State Classification**
Ozone (1-hr)	No Federal Standard	**Nonattainment (Severe)**
Ozone (8-hr)	**Nonattainment (Serious)** [a]	**Nonattainment**
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM10	Attainment [b]	**Nonattainment**
PM2.5	**Nonattainment**	**Nonattainment**

Source: SJVAPCD 2008 (http://www.valleyair.org/aqinfo/attainment.htm).
Notes:
[a] In April 2007, the SJVAPCD Governing Board proposed to re-classify the region as "extreme" nonattainment, and the U.S. EPA is reviewing the request. The January 6, 2010 proposal to change the federal 8-hour ozone standard may affect this designation.
[b] In November 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 National Ambient Air Quality Standard (NAAQS) and approved the PM10 Maintenance Plan.

Nonattainment Criteria Pollutants

Air Quality Table 4 summarizes the existing ambient monitoring data for nonattainment criteria pollutants (ozone and particulate matter) collected by ARB and SJVAPCD from monitoring stations closest to the project site. All data in this table are marked in bold to indicate that the most-stringent current standard was exceeded. Note that an exceedance is not necessarily a violation of the standard, and that only persistent exceedances lead to designation of an area as nonattainment.

AIR QUALITY Table 4
Highest Measured Concentrations of Nonattainment Pollutants (ppm or µg/m^3)

Pollutant	Averaging Time	2003	2004	2005	2006	2007	2008
Ozone (ppm)	1 hour	**0.110**	**0.104**	**0.115**	**0.120**	**0.100**	**0.127**
Ozone (ppm)	8 hour	**0.091**	**0.084**	**0.094**	**0.097**	**0.081**	**0.106**
PM10 (µg/m^3)	24 hour	**70**	**80**	**93**	**96**	**83**	**111.1**
PM10 (µg/m^3)	Annual	**28.8**	**29.1**	**29.1**	**31.7**	**27**	**31.3**
PM2.5 (µg/m^3)	24 hour	**64**	**53**	**80**	**71**	**64**	**64.5**
PM2.5 (µg/m^3)	Annual	**14.5**	**13.6**	**13.9**	**14.8**	**15**	**16**

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html). Accessed December 2009.
Notes: Monitoring Station for ozone, PM10, and PM2.5: 2003-2008: Modesto-14th Street.

Ozone

Ozone is not a direct emission from stationary or mobile sources. It is a secondary pollutant formed through complex chemical reactions between nitrogen oxides (NOx) and volatile organic compounds (VOC). Ozone formation is highest in the summer and fall when abundant sunshine and high temperatures trigger the necessary photochemical reactions, and lowest in the winter. The days with the highest ozone concentrations commonly occur between June and August, but the region's ozone management season officially runs from April through November (the second and third calendar quarters, Q2 and Q3).

Respirable Particulate Matter (PM10)

PM10 is a mixture of small solid particles and liquid droplets with the size less than or equal to 10 microns diameter. PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx and VOC from turbines, and ammonia from NOx control equipment, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO3), sulfates (SO4), 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 (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the wintertime are a significant portion of the total PM10, and an even higher contributor to particulate matter of less than 2.5 microns (PM2.5). The nitrate ion is only a portion of the PM nitrate, which can be in the form of ammonium nitrate (ammonium plus nitrate ions) or sodium nitrate.

AIR QUALITY Table 5 summerizes the ambient PM10 data collected from the nearest monitoring stations and the highest PM10 concentrations in the SJVAPCD. As shown in the table, the federal 24-hour standard has never been exceeded at the stations near the project site from 2003 to 2008. However, the CAAQS 24-hour standard has been exceeded several times each year. PM10 is primarily a winter problem, but high regional PM10 levels occur at other times of the year as well. Days with high PM10 concentrations commonly occur in November and December, but the region's PM10 management season officially runs from October through March (the first and fourth calendar quarters, Q1 and Q4). Northern California wildfires in Monterey County, Santa Clara County, and the Sierra Nevada foothills during June 2008 were probably responsible for the most-recent high PM10 concentrations.

AIR QUALITY Table 5
Highest Measured PM10 Concentrations, 2003-2008 (µg/m^3)

	Max. 24-hr Avg.	Days Above CAAQS	Days Above NAAQS	Annual
Modesto-14th Street				
2003	**70**	26.3	0	**28.8**
2004	**80**	36	0	**29.1**
2005	**93**	51.4	0	**29.1**
2006	**96**	46.3	0	**31.7**
2007	**83**	37.7	0	**27**
2008	**111.1**	-	0	**31.3**
Turlock-S Minaret Street				
2003	**87**	47.9	0	**30.6**
2004	**59**	31.2	0	**30**
2005	**83**	48.8	0	**29.3**
2006	**97**	-	0	**34.7**
2007	**73**	54.9	0	**30.8**
2008	**96**	-	0	**35.2**
District-wide				
2003	**150**	167.2	0	**52.4**
2004	**217**	113	0.9	**47.9**
2005	**131**	146.3	0	**44.3**
2006	**304**	166.8	4.2	**55.4**
2007	**172.1**	145.2	1.4	**54.8**
2008	**390.3**	182.3	4.8	**59.7**

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html), Accessed December 2009.

Fine Particulate Matter (PM2.5)

PM2.5 refers to particles and droplets with the diameter less than or equal to 2.5 microns. PM 2.5 is believed to pose the greater health risks than PM10 because it can lodge deeply into the lungs due to the small size. PM2.5 includes nitrates, sulfates, organic carbon and element carbon, which mainly result from combustions and atmospheric reactions. Almost all combustion-related particles, including those from wood smoke and cooking, are smaller than 2.5 microns. Nitrate and sulfate particles are formed through complex chemical reactions in the atmosphere. Particulate nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the winter make up a large portion of the total PM2.5. Ammonium sulfate is also a concern because of the ready availability of ammonia in the atmosphere.

AIR QUALITY Table 6 summarizes the ambient PM2.5 data collected from the closest monitoring station. The highest PM2.5 concentrations are generally measured in the winter. The wood-smoke particles and nitrate ions during the winter make up a large contribution to the toal PM2.5 concentration.

AIR QUALITY Table 6
Highest Measured PM2.5 Concentrations, 2003-2008 (µg/m^3)

	Max. 24-hr Avg.	Days Above NAAQS	Annual (over 3 year period)
2003	**64.0**	20.9	**14.5**
2004	**53.0**	27.3	**13.6**
2005	**80.0**	26.8	**13.9**
2006	**71.0**	26.8	**14.8**
2007	**64.0**	49.1	**15.0**
2008	**64.5**[a]	39.4	**16.0**

Note: [a] Exceptional PM concentration events, such as those caused by wind storms was excluded according to U.S. EPA AirData.
Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html), Accessed December2009.
United States Environmental Protection Agency. AirData : Access to Air Pollution Data.
(http://www.epa.gov/aqspubl1/annual_summary.html). Accessed December 2009.

Attainment Criteria Pollutants

Carbon Monoxide

Carbon monoxide (CO) is a product of incomplete combustion due to the insufficiency of oxygen content. Mobile sources are the main sources of CO emissions. Ambient concentrations of CO are highly dependent on motor vehicle activity. CO is a local pollutant, with high concentrations usually found near the emission sources. The highest CO concentrations occur during rush hour traffic in the mornings and afternoons. Ambient CO concentrations attain the air quality standards due to two state-wide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phase I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to reduced CO emissions. **AIR QUALITY Table 7** shows the maximum 8-hour CO concentrations at the closest stations.

AIR QUALITY Table 7
Maximum Concentrations of Criteria Pollutants in Attainment, 2003-2008 (ppm)

Location	Pollutant (Averaging Time)	2003	2004	2005	2006	2007	2008
Modesto-14th Street	CO (1 hour)	5.3	4.6	3.7	6.9	3.7	2.8
	CO (8 hour)	3.76	2.98	2.89	3.73	3.16	1.94
	NO_2 (1 hour)	0.091	0.065	0.072	---	---	---
	NO_2 (annual)	0.017	0.015	0.014	---	---	---
Turlock-S Minaret Street	CO (1 hour)	3.4	2.9	2.8	2.6	2.7	1.9
	CO (8 hour)	2.31	1.78	2.34	2.06	1.69	1.48
	NO_2 (1 hour)	0.090	0.061	0.065	0.058	0.053	0.063
	NO_2 (annual)	0.015	0.014	0.013	0.013	0.012	0.012
Bethel Island Road	SO_2 (1 hour)	0.016	0.015	0.017	0.017	0.018	0.012
	SO_2 (24 hour)	0.008	0.006	0.006	0.007	0.005	0.004
	SO_2 (annual)	0.002	0.002	0.002	0.002	0.002	0.001

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html), Accessed December 2009.

Nitrogen Dioxide

Nitrogen oxides (NOx) include nitric oxide (NO) and nitrogen dioxide (NO_2). Approximately 75 to 90% of the NOx emitted from combustion sources is NO, while the balance is NO_2. NO is oxidized in the atmosphere to NO_2 by oxygen and ozone. High concentrations of NO_2 usually occur during the fall when atmospheric conditions tend to trap ground-level emissions but lack significant photochemical activitiy due to less sunlight. In the summer, the converion rates of NO to NO_2 are high, but the relatively

high temperatures and windy conditions (atmospheric unstable conditions) generally disperse pollutants and also engage NO in reactions with VOCs to form ozone. The formation of NO_2 in the presence of ozone is according to the following reaction:

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

Urban areas typically have high daytime ozone concentrations that drop substantially at night as the above reaction takes place, and ozone scavenges the available NO. If ozone is unavailable to oxidize the NO, less NO_2 will form because the reaction is "ozone-limited." This reaction explains why, in urban areas, ground-level ozone concentrations drop at night, while aloft and in downwind rural areas (without sources of fresh NO emissions), ozone concentrations can remain relatively high.

The current CAAQS for NO_2 became effective in early 2008, and the U.S. EPA adopted a new 1-hour standard in early 2010. Although the attainment designations have not yet been established for the new, more stringent standards, the San Joaquin Valley air basin appears likely to remain attainment for NO_2. The new federal 1-hour standard would become effective some time in 2010, and areas will not be given attainment designations until 2012. Data from 2003 to 2008 shows that the areas near the project site attain all current state and federal NO_2 standards (ARB 2009). See **Air Quality Table 7** for maximum 1-hour and annual NO_2 concentrations at the closest monitoring stations.

Sulfur Dioxide

Sulfur dioxide is typically emitted as a result of the combustion of fuels containing sulfur. Natural gas contains very little sulfur and consequently has very low SO_2 emissions when burned. By contrast, fuels with high sulfur content, such as coal, emit very large amounts of SO_2 when burned. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels in gaseous, liquid and solid forms. The whole state is designated attainment for all state and federal SO_2 ambient air quality standards. See **Air Quality Table 7** for maximum 1-hour, 24-hour, and annual SO_2 concentrations at the closest monitoring station.

Summary of Existing Ambient Air Quality

In summary, staff recommends using the background ambient air concentrations in **AIR QUALITY Table 8** as the baseline for the modeling and impacts analysis. The highest criteria pollutant concentrations from the last three years of available data collected at the monitoring stations close to the project site are used to determine the recommended background values. Concentrations in excess of their ambient air quality standard are shown in bold.

The pollutant modeling analysis was limited to the pollutants listed in **AIR QUALITY Table 8**. Therefore recommended background concentrations were not determined for the other criteria pollutants (ozone and lead).

AIR QUALITY Table 8
Staff-Recommeded Background Concentrations (µg/m^3)

Pollutant	Averaging Time	Background	Limiting Standard	Percent of Standard
PM10	24 hour	**111.1**	50	**222**
	Annual	**31.7**	20	**159**
PM2.5	24 hour	**71.0**	35	**203**
	Annual	**16.0**	12	**133**
CO	1 hour	7,935	23,000	35
	8 hour	4,144	10,000	41
NO_2	1 hour	118.7	339	35
	Annual	24.7	57	43
SO_2	1 hour	47.2	655	7
	24 hour	18.4	105	18
	Annual	5.3	80	7

Source: AFC Table 5.1-26 (TID2009a), updated with ARB 2009.
Note that an exceedance is not necessarily a violation of the standard, and that only persistent exceedances lead to designation of an area as nonattainment.

Existing Emissions

The proposed project would be located in Ceres, Stanislaus County, California, on a 4.6-acre parcel located adjacent to the existing Turlock Irrigation District (TID) Almond Power Plant (APP). The equipment at the existing TID Almond Power Plant consists of one 48 MW General Electric (GE) LM-6000 natural gas-fired, steam-injected combustion turbine generator (permitted heat input capacity of 459 million British thermal units per hour [MMBtu/hr]), and one 240 HP Cummins diesel fire pump engine.

TID would be a common owner and operator of the existing APP and the proposed A2PP, therefore some existing facilities would be shared between the two plants as follows.

Shared Existing Facilities:

- The anhydrous ammonia system, including the 12,000-gallon storage tank and unloading facilities
- The fire protection system, including the fire water storage tank and diesel-fired emergency fire pump
- The well water for service water and emergency shower / eyewash stations
- The water treatment system
- The process water supply and wastewater discharge system
- The instrument and service air systems
- The oil/water separator
- The demineralized and reverse osmosis water storage tanks
- The administration building, including the control room and office space

Air Quality Table 9 summarizes the allowable (permitted) emissions for the existing Almond Power Plant and the actual emissions including 2007 and the first nine months of 2008.

AIR QUALITY Table 9
Existing TID Almond Power Plant, Allowable Emissions and Actual Emissions (tons/yr)

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Existing Allowable Emissions	**26.0**	**5.3**	**8.8**	**68.3**	**5.7**
Existing APP, 2007	6.4	1.1	1.9	0.8	0.3
Existing APP, 2008 (partial year)	5.6	0.9	1.5	1.3	0.2

Source: AFC Table 5.1-13 (TID2009a) and Responses to DR2 (CH2M2009f).

PROJECT DESCRIPTION AND PROPOSED EMISSIONS

The proposed A2PP would include the following new stationary sources of emissions (AFC Section 2.1.2, TID2009a and TID2009x):

- Three LM6000PG SPRINT natural-gas fired combustion turbine generators (CTG) with a nominal capacity of 54.2 MW and a heat input capacity of up to 554.9 MMBtu/hr for each gas turbine, in a simple-cycle configuration; and
- an administration building, including the control room, office space, expanded maintenance shop and warehouse, and communication systems shared by the A2PP and existing Almond Power Plant.

Separate emissions estimates for the proposed project during the construction phase, initial commissioning, and operation are each described next.

Proposed Construction Emissions

Construction of the A2PP is expected to take about 12 months. Onsite construction activities include site preparation, foundation work, installation of major equipment, and construction/installation of major structures. During the construction period, air emissions would be generated from the exhaust of off-road/non-road construction equipment and on-road vehicles and fugitive dust from activity on unpaved surfaces and material handling. Construction activities would typically occur between 7 a.m. and 3:30 p.m., Monday through Saturday (AFC Section 2.1.14, TID2009a). Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities such as pouring concrete at night during hot weather, working around time-critical shutdowns and constraints. During some of the construction period and during the initial commissioning phase of the project, some activities would continue 24 hours per day, 7 days per week. The project would also include a new switchyard, an 11.6 mile long natural gas pipeline and new and reconductored transmission lines (AFC Appendix 5.1 E-2, TID2009a, Data Responses, Set 1D, CH2M2009k). These linear facilities would be constructed prior to or simultaneously with the construction of the project.

Fugitive dust emissions would result from (AFC Appendix 5.1E-1, TID2009a):

- Dust entrained during site preparation and grading/excavation at the construction site;
- Dust entrained during on-site travel on paved and unpaved surfaces;
- Dust entrained during aggregate and soil loading and unloading operations; and
- Wind erosion of soil at areas disturbed during construction activities.

Combustion-related emissions would be the result of:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, trenching, and construction of onsite structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from portable welding machines;
- Exhaust from pickup trucks and diesel trucks used to transport workers and materials around the construction site;
- Exhaust from diesel trucks used to deliver concrete, fuel and construction supplies to the construction site; and
- Exhaust from automobiles used by workers to commute to the construction site.

Estimates for the highest daily emissions and total annual emissions over the 12-month construction period are shown in **Air Quality Table 10**.

AIR QUALITY Table 10
A2PP, Estimated Maximum Construction Emissions

Construction Activity	NOx	VOC	PM10	PM2.5	CO	SOx
On-site Construction Equipment (lb/day)	60.4	6.5	3.9	3.9	95.8	0.5
On-site Fugitive Dust (lb/day)		---	11.4	4.7	---	---
Off-site (On-road) Worker Travel, Truck Deliveries, Dust (lb/day)	46.0	5.2	1.2	1.2	32.7	<0.1
Off-site Linear Facility and Pipeline Equipment, Fugitive Dust, Worker Travel and Truck Delivery (lb/day)	68.7	7.5	11.0	3.6	48.0	0.1
Maximum Daily Construction Emissions (lb/day)	**175.1**	**19.2**	**27.5**	**13.4**	**176.5**	**0.6**
On-site Construction Equipment (tpy)	6.9	0.7	0.4	0.4	10.3	0.05
On-site Fugitive Dust (tpy)	---	---	1.1	0.4	---	---
Off-site (On-road) Worker Travel & Truck Deliveries (tpy)	3.4	0.4	0.1	0.1	2.9	0.01
Off-site Linear Facility and Pipeline Equipment and Fugitive Dust, Worker Travel and Truck Delivery (tpy)	2.9	0.3	0.5	0.1	2.0	0
Peak Annual Construction Emissions (tpy)	**13.2**	**1.4**	**2.1**	**1.0**	**15.2**	**0.06**

Source: AFC Appendix 5.1E Tables 5.1E-1 to 5.1E-5, Attachment 5.1E-1 (TID2009a, CH2M2009f, and CH2M2009k). Worst-case totals assume simultaneous maximum emissions during linear facility construction.
Note: Different activities have maximum emissions at different time during the construction period; therefore, total maximum daily, monthly, and annual emissions might be different from the summation of emissions from individual activities.

Proposed Initial Commissioning Emissions

New electrical generation facilities must go through initial commissioning phases before becoming commercially available to generate electricity. During this period, initial firing causes greater emissions than those that occur during normal operations because of the need to tune the combustor, conduct numerous startups and shutdowns, operate under low loads, and conduct testing before emission control systems are functioning or fine-tuned for optimum performance.

The applicant expects that approximately 288 hours of operation (AFC Table 5.1B-7a) would be needed to accomplish the various following commissioning activities:

- Full Speed No Load Tests (FSNL) – a test of the gas turbine ignition system, a test to ensure that the CTG is synchronized with its electric generator, and a test of the CTG's speed control system.
- Minimum Load Tests (without SCR Operational) – several days of tuning the CTG combustor to minimize emissions and perform other checks.
- Multiple Load Tests (SCR/Oxidation Catalyst Operational at Various Levels) – several days of installing control systems and tuning to achieve NOx and CO control at design levels.

Air Quality Table 11 presents the applicant's anticipated maximum hourly and daily short-term emissions of criteria pollutants. Maximum hourly and daily emissions for NOx and CO would occur with the gas turbine in the steam blow phase and partial load tests before emission control systems are installed and operational. Emission rates for VOC, PM10, PM2.5, and SOx during initial commissioning are not expected to be higher than normal operating emissions. This is because PM10 and SOx emissions are proportional to fuel use. The total initial commissioning emissions are presented in **Air Quality Table 11.**

AIR QUALITY Table 11
A2PP, Maximum Initial Commissioning Emissions (hourly and daily)

Commissioning Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each CTG (lb/hr)	40.40	8.41	2.5	40.0	1.56
Each CTG (lb/day)	969.6	201.8	60.0	704.6	37.4

Source: AFC Appendix 5.1B Table 5.1B-7a (TID2009a) and FDOC (SJVAPCD 2010).

Operation Emission Controls

NOx Controls

The combustion turbine would use state-of-the-art single annular combustors, with water injection and Selective Catalytic Reduction (SCR) system for NOx control. Exhaust from each turbine would enter the SCR system before being released into the atmosphere. SCR refers to a process that chemically reduces NOx to nitrogen (N_2) and water vapor (H_2O) by injecting ammonia (NH_3) into the flue gas stream in the presence of a catalyst and excess oxygen. The process is termed selective because the ammonia preferentially reacts with NOx rather than oxygen. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or noble metals are also used. Regardless of the type of catalyst used, efficient conversion of

NOx to nitrogen and water vapor requires the uniform mixing of ammonia into the exhaust gas stream and a catalyst surface large enough to ensure sufficient time for the reaction to take place.

VOC and CO Controls

Emissions of CO and unburned hydrocarbons, including VOC, will be controlled with an oxidation catalyst installed in conjunction with the SCR catalyst. An oxidation catalyst system chemically reacts with organic compounds and CO with excess oxygen to form carbon dioxide (CO_2) and water. Unlike the SCR system for reducing NOx, an oxidation catalyst does not require any additional chemicals.

PM10/PM2.5 and SOx Controls

The exclusive use of pipeline-quality natural gas, a clean-burning fuel that contains very little sulfur or noncombustible solid residue, will limit the formation of SOx and particulate matter. Natural gas does contain small amounts of a sulfur-based scenting compound known as mercaptan, which results in some SOx emissions when burned. However, in comparison with other fossil fuels used in thermal power plants, SOx emissions from natural gas are very low. Particulate matter emissions from natural gas combustion are also very low compared with other fossil fuels. The sulfur content of pipeline-quality natural gas is normally less than 1 grain of sulfur per 100 cubic feet at standard temperature and pressure (gr/100 scf). High-efficiency air inlet filtration and a lube oil vent coalesce would also be used to control particulate emissions.

Proposed Operation Emissions

Air Quality Table 12 through **Air Quality Table 14** summarize the maximum (worst-case) criteria pollutant emissions associated with A2PP's normal and routine operation. Emissions for the combustion turbine system are based upon:

- NOx emissions controlled to 2.5 parts per million by volume, dry basis (ppmvd) corrected to 15% oxygen, averaged over any 1-hour period;
- VOC emissions controlled to 2.0 ppmvd with the use of good combustion practises;
- CO emissions controlled to 4.0 ppmvd at 15% oxygen for any 3-hour period;
- PM10/PM2.5 emissions at 2.5 lb/hr;
- SOx emissions based on an emission factor of 0.0028 lb per MMBtu of heat input and hourly or daily levels of fuel sulfur content of up to 1 gr/100 scf; and
- CTG firing up to 8,030 hours annually including 365 hours in startup mode (for the worst-case NOx, VOC, and CO estimates) with the option of operating up to 8,760 hours annually in steady-state mode (for the worst-case PM10/PM2.5 and SOx estimates).

Air Quality Table 12 lists the maximum hourly emissions from each CTG estimated by the applicant. Emissions for NOx, CO, and VOC during startup and shutdown events would have higher emissions than during normal operation. Since PM10 and SOx emissions are proportional to fuel use, PM10 and SOx have higher emissions rates during full-load operation.

AIR QUALITY Table 12
A2PP, Maximum Hourly Emissions Rates (pounds per hour [lb/hr])

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each CTG, steady state, full load	5.0	1.4	2.5	4.9	1.56
Each CTG, startups/shutdowns	25.0	2.0	2.5	40.0	1.56
Total, A2PP, Three CTGs	**75.0**	**6.0**	**7.5**	**120.0**	**4.7**

Source: AFC Table 5.1-18, Appendix A Table 5.1A-5 (TID2009a).

Air Quality Table 13 lists the worst-case emissions during any given day of operation of the proposed A2PP. Daily combustion turbine emissions for NOx, VOC, and CO are based on 2 hours in a startup/shutdown mode and 22 hours of full load operation, and for PM10 and SOx daily emissions are based on 24 hours of operation.

AIR QUALITY Table 13
A2PP, Maximum Daily Emissions (pounds per day [lb/day])

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each CTG, steady state, full load	110.5	30.8	55.0	107.7	34.3
Each CTG, startups/shutdowns	50.0	4.0	5.0	80.0	3.1
Total, A2PP, Three CTGs	**481.6**	**104.5**	**180.0**	**563.0**	**112.4**

Source: AFC Table 5.1-18, Appendix A Table 5.1A-5 (TID2009a).

Air Quality Table 14 lists maximum potential annual emissions from the proposed project, based on applicant and District calculations reviewed by staff. The operating assumptions include CTG firing up to 8,395 hours annually including 365 hours in startup mode (for the worst-case NOx, VOC, and CO estimates) with the option of operating up to 8,760 hours annually in steady-state mode (for the worst-case PM10 and SOx estimates).

AIR QUALITY Table 14
A2PP, Maximum Annual Emissions (tons per year [tpy])

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each CTG, steady state, full load	19.0	5.3	10.5	18.5	6.2
Each CTG, startups/shutdowns	4.6	0.4	0.5	7.3	0.3
Total, A2PP, Three CTGs	**70.7**	**17.0**	**32.9**	**77.5**	**19.4**

Source: AFC Table 5.1-18, Appendix A Table 5.1A-5 (TID2009a).

Ammonia Emissions

Ammonia (NH_3) is injected into the flue gas stream as part of the SCR system that controls NOx emissions. In the presence of the catalyst, the ammonia and NOx react to form harmless elemental nitrogen and water vapor. However, not all of the ammonia reacts with the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered from the stacks. These ammonia emissions are known as ammonia slip.

The applicant proposes to limit ammonia slip emissions from the combustion turbine system to 10 ppmvd. However, Energy Commission staff notes that the control system

can be operated and maintained to routinely achieve less than 5 ppmvd for ammonia slip, as established in the Guidance for Power Plant Siting (ARB 1999).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff characterizes air quality impacts as follows: All project emissions of nonattainment criteria pollutants and their precursors (NOx, VOC, PM10, PM2.5, SOx, and NH_3) are considered significant and must be mitigated. For short-term construction activities that essentially cease before operation of the power plant, our assessment is qualitative and mitigation consists of controlling construction equipment tailpipe emissions and fugitive dust emissions to the maximum extent feasible. For operating emissions, the mitigation includes both the Best Available Control Technology (BACT) and emission reduction credits (ERC) or other valid emission reductions to offset emissions of both nonattainment criteria pollutants and their precursors.

The ambient air quality standards used by staff as the basis for characterizing project impacts are health-based standards established by the ARB and U.S. EPA. They are set at levels that contain a margin of safety to adequately protect the health of all people, including those most sensitive to adverse air quality impacts such as the elderly, persons with existing illnesses, children, and infants.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Ambient air quality impacts occur when project emissions cause the ambient concentration of a pollutant to increase. Project-related emissions are the actual mass of emitted pollutants, which are diluted in the atmosphere before reaching the ground. Analysis begins with quantifying the emissions, then uses an atmospheric dispersion model to determine the probable change in ground-level concentrations.

Dispersion models complete the complex, repeated calculations that consider emissions in the context of various ambient meteorological conditions, local terrain, and nearby structures that affect air flow. For the A2PP, the surface meteorological data used as an input to the dispersion model included four years (2000-2004, excluding 2002) of hourly wind speeds and directions measured at the Modesto meteorological station, combined with upper-air meteorological data from Oakland International Airport monitoring station.

The applicant conducted the air dispersion modeling based on guidance presented in the *Guideline on Air Quality Models* (EPA, 2005) and the American Meteorological Society/Environmental Protection Agency Regulatory Model known as AERMOD (version 07026) for an analysis of the operating-phase emissions. The U.S. EPA designates AERMOD as a “preferred” model for refined modeling in all types of terrain. For determining NO_2 impacts of short-term emissions (1-hour averaging period), NOx emissions are further modeled using the more-rigorous Plume Volume Molar Ratio Method (PVMRM) or the Ozone Limiting Method (OLM). Because project NOx emissions would be approximately 90% NO that could oxidize into NO_2 with sufficient time, sunlight, and availability of organic compounds or ozone, use of the PVMRM or OLM is appropriate. On October 23, 2009, the U.S. EPA released an update of the AERMOD model (version 09292), which includes the corrections to the OLM source

group (OLMGROUP) feature of the OLM method. Energy Commission staff independently conducted new air dispersion modeling for NO_2 using the updated OLM method. Concurrent hourly ozone data from Modesto monitoring station is used in modeling the reactive NOx and NO_2 impacts. Staff's modeling analysis indicates higher short-term NO_2 impacts than estimated by the applicant. All results shown for 1-hour NO_2 reflects the *maximum* concentration for any one year. These results are not comparable to the new standard being promulgated in by U.S. EPA, which is expressed as a 3-year average of the 98th percentile value of the daily maximum 1-hour concentrations. Because U.S. EPA does not yet offer modeling software capable of generating concentration statistics in a form that can be used in a compliance demonstration for this new federal standard, staff only includes the California NO_2 standard in this analysis.

Project-related modeled concentrations for all pollutants are added to highest monitored background concentrations to arrive at the total impact of the project. The total impact is then compared with the ambient air quality standards for each pollutant to determine whether the project's emissions would either cause a new violation of the ambient air quality standards or contribute to an existing violation.

Construction Impacts and Mitigation

This section discusses the project's short-term direct construction ambient air quality impacts assessed by the applicant and, as necessary, independently assessed by Energy Commission staff. The ambient air quality impacts are modeled using AERMOD, and the impacts for NO_2 are modeled using the ozone limiting method (OLM). Construction modeling for A2PP used four years of meteorological data (2000-2004 from Modesto, excluding 2002) prepared by SJVAPCD, with concurrent ozone data also from Modesto for modeling reactive NOx and NO_2.

Air Quality Table 15 summarizes the results of the modeling analysis for construction activities. The total impact is the sum of the existing background condition plus the maximum impact predicted by the modeling analysis for project activity. The values in **bold** in the Impact and Background columns represent the values that either equal or exceed the relevant ambient air quality standard.

AIR QUALITY Table 15
A2PP, Construction-Phase Maximum Impacts (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	17.2	**111.1**	**128.3**	50	**257**
	Annual	2.1	**31.7**	**33.8**	20	**169**
PM2.5	24 hour	9.7	**71**	**80.7**	35	**231**
	Annual	1.1	**16.0**	**17.1**	12	**143**
CO	1 hour	1,345	7,935	9,280	23,000	40
	8 hour	233	4,144	4,377	10,000	44
NO_2	1 hour [a]	156.2	118.7	274.9	339	81
	Annual [a]	9.4	24.7	34.1	57	60
SO_2	1 hour	7.3	47.2	54.5	655	8
	24 hour	0.6	18.4	19	105	18
	Annual	0.1	5.3	5.4	80	7

Source: AFC Appendix 5.1E Table 5.1E-7 (TID2009a), with independent staff assessment for NO_2, December 2009.
Note: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output, and the ambient ratio method (ARM) is applied for annual NO_2, using national default 0.75 ratio.

The maximum modeled project construction impacts are predicted to occur near the northern fence lines for the worst 1-hour impacts and at the western fence line for the 24-hour impacts. For each pollutant, the concentrations would decrease rapidly with distance. The nearest residential receptors are approximately 0.3 miles from the plant, not near the fence line. Areas in the immediate vicinity of the work could experience maximum concentrations over the newly-established federal 1-hour NO_2 ambient air quality standard only if the statistical form of the standard is ignored; application of multi-year averaging of the NO_2 impacts and backgrounds, as specified by the new federal 1-hour NO_2 standard would reveal lower concentrations than shown here.

Staff believes that particulate matter emissions from construction would cause a significant impact because they will contribute to existing violations of PM10 and PM2.5 ambient air quality standards, and additionally that those emissions can and should be mitigated to a level of insignificance. Significant secondary impacts would also occur for PM10, PM2.5, and ozone because construction-phase emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would also contribute to existing violations of these standards. The direct impacts of NO_2, in conjunction with worst-case background conditions, would not create a new violation of the California 1-hour or annual NO_2 ambient air quality standard. The direct impacts of CO and SO_2 would not be significant because construction of the project would neither cause nor contribute to a violation of these standards. Mitigation for construction emissions of PM10, PM2.5, SOx, NOx, and VOC would be appropriate for reducing PM10, PM2.5, NO_2, and ozone impacts.

Construction Mitigation

The applicant proposes to reduce construction-related emissions of particulate matter, particulate matter precursors, and ozone precursors by implementing measures consistent with local air district recommendations, soil erosion control requirements, and nuisance prohibitions (AFC Section 5.1.3.8, TID2009a). Emissions mitigation and/or control techniques proposed by the applicant for reducing engine emissions during construction of A2PP include:

- Operational measures, such as limiting time spent with the engine idling by shutting down equipment when not in use;
- Regular preventive maintenance to prevent emission increases due to engine problems;
- Use of low sulfur and low aromatic fuel meeting California standards for motor vehicle diesel fuel; and
- Use of low-emitting gasoline and diesel engines meeting state and federal emissions standards for construction equipment, including, but not limited to, catalytic converter systems and diesel particulate filter systems.

The applicant-proposed control strategies for fugitive dust emissions during construction of A2PP include:

- Use either water application or chemical dust suppressant application to control dust emissions from onsite unpaved road travel and unpaved parking areas;

- Use vacuum sweeping and/or water flushing of paved road surfaces to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas;
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard;
- Limit traffic speeds on all unpaved site areas to 15 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to roadways;
- Install tire cleaning stations or rumble plates to clean tires of all trucks exiting construction site; and
- Mitigate fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by application of either water or chemical dust suppressant.

Staff agrees that the applicant's proposed mitigation would be effective, although staff believes that additional construction mitigation measures could reduce potential impacts even more.

Additional measures recommended by staff would reduce construction-phase impacts to a less than significant level by further reducing construction emissions of particulate matter and combustion contaminants. Staff believes that the short-term and variable nature of construction activities warrants a qualitative approach to mitigation. Construction emissions and the effectiveness of mitigation varies widely depending on variable levels of activity, the specific work taking place, the specific equipment, soil conditions, weather conditions, and other factors, making precise quantification difficult. Despite this variability, there are a number of feasible control measures that can be implemented to significantly reduce construction emissions. Staff has determined that the use of oxidizing soot filters is a viable emissions control technology for all heavy diesel-powered construction equipment that does not use an ARB-certified low emission diesel engine. In addition, staff proposes that, prior to beginning construction, the applicant should provide an Air Quality Construction Mitigation Plan (AQCMP) that specifically identifies mitigation measures to limit air quality impacts during construction. Staff includes proposed staff Conditions of Certification **AQ-SC1** through **AQ-SC5** to implement these requirements. These conditions are consistent with both the applicant's proposed mitigation and the conditions of certification adopted in similar prior licensing cases. Compliance with these conditions would substantially eliminate the potential for significant air quality impacts during construction of the A2PP project.

Operation Impacts and Mitigation

The following section discusses ambient air quality impacts that were estimated by TID and subsequently evaluated by Energy Commission staff. The applicant performed a number of direct impact modeling analyses, including both fumigation modeling and modeling for impacts during commissioning.

Routine Operation Impacts

A refined dispersion modeling analysis was performed by the applicant to identify off-site criteria pollutant impacts that would occur from routine operational emissions throughout the life of the project. A revised modeling was conducted by Energy Commission staff by using the updated OLM method. The worst case 1-hour NO_2 and CO impacts reflect startup impacts, and all other impacts reflect the impacts during normal operation. The modeled impacts are extremely conservative, since the maximum impacts are evaluated under a combination of highest allowable emission rates and the most extreme meteorological conditions, which are unlikely to occur simultaneously. Emissions rates are shown in **Air Quality Table 12** to **Air Quality Table 14**. The predicted maximum concentrations of non-reactive pollutants are summarized in **Air Quality Table 16**. PM10 and PM2.5 values are shown in bold because they exceed ambient air quality standards due to high background levels.

AIR QUALITY Table 16
A2PP, Routine Operation Maximum Impacts (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	1.2	**111.1**	**112.3**	50	**225**
	Annual	0.1	**31.7**	**31.8**	20	**159**
PM2.5	24 hour	1.2	**71**	**72.2**	35	**206**
	Annual	0.1	**16.0**	**16.1**	12	**134**
CO	1 hour	65.9	7,935	8,000.9	23,000	35
	8 hour	6.4	4,144	4,150.4	10,000	42
NO_2	1 hour [a]	41.2	118.7	159.9	339	47
	Annual	0.3	24.7	25.0	57	44
SO_2	1 hour	1.8	47.2	49.0	655	7
	24 hour	0.5	18.4	18.9	105	18
	Annual	0.1	5.3	5.4	80	7

Source: AFC Table 5.1-26 (TID2009a), with independent staff assessment for NO_2, December 2009.
Note: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output.

The maximum 24-hour PM10 impact occurs in the undeveloped area about 0.1 miles southeast of the project site, and impacts would be substantially lower at the closest single-family residences, which are located approximately 0.3 mile to the northeast. Staff believes that particulate matter emissions from routine operation would cause a significant impact because they will contribute to existing violations of PM10 and PM2.5 ambient air quality standards. Significant secondary impacts would also occur for PM10, PM2.5, and ozone because operational emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would also contribute to existing violations of these standards. The direct impacts of NO_2, in conjunction with worst-case background conditions, would not create a new violation of the NO_2 ambient air quality standards; application of multi-year averaging of the NO_2 impacts and backgrounds, as specified by the new federal 1-hour NO_2 standard would reveal lower concentrations than shown here. The direct impacts of CO and SO_2 would not be significant because routine operation of the project would neither cause nor contribute to a violation of these standards. Mitigation for emissions of PM10, PM2.5, SOx, NOx, and VOC would be appropriate for reducing PM10, PM2.5, and ozone impacts.

Secondary Pollutant Impacts

The project's gaseous emissions of NOx, SOx, VOC, and ammonia are precursor pollutants that can contribute to the formation of secondary pollutants, ozone, PM10, and PM2.5. Gas-to-particulate conversion in ambient air involves complex chemical and physical processes that depend on many factors, including local humidity, pollutant travel time, and the presence of other compounds. Currently, there are no agency-recommended models or procedures for estimating ozone or particulate nitrate or sulfate formation from a single project or source. However, because of the known relationships of NOx and VOC to ozone and of NOx, SOx, and ammonia emissions to secondary PM10 and PM2.5 formation, unmitigated emissions of these pollutants would likely contribute to higher ozone and PM10/PM2.5 levels in the region. Significant impacts of ozone and PM10/PM2.5 precursors would be mitigated with SJVAPCD offsets (**AQ-SC7**).

Ammonia (NH_3) is a particulate precursor but not a criteria pollutant. Reactive with sulfur and nitrogen compounds, ammonia is especially abundant in the San Joaquin Valley from natural sources, agricultural sources, and as a byproduct of tailpipe controls on motor vehicles. Ammonia particulate forms more readily with sulfates than with nitrates, and particulate formation in the San Joaquin Valley has been found to be limited by the availability of SOx and NOx in ambient air, rather than the availability of ammonia (SJVAPCD 2008 PM2.5 Plan). Offsetting SOx and NOx emissions would both avoid significant secondary PM10/PM2.5 impacts and reduce secondary pollutant impacts to a less than significant level.

Energy Commission staff recommends limiting ammonia slip emissions to the extent feasible. This level of control is appropriate for avoiding unnecessary ammonia emissions, consistent with staff policy to reduce emissions of all nonattainment pollutant precursors to the lowest feasible levels. Levels lower than 10.0 ppmvd can be achieved on a routine basis with a sufficiently designed catalyst and ammonia injection system. Somewhat higher costs of installing sufficient catalyst material would be offset through lower costs of purchasing ammonia that would be wastefully emitted at higher slip levels. Staff reviewed previous cases to determine an NH_3 emission reduction strategy that represents an achievable, feasible, and best available level of ammonia control for the CTGs proposed for A2PP. Supported by the recent Energy Commission decision on the Orange Grove Energy Project (08-AFC-4, Final Commission Decision, April 2009), which would use similar CTGs controlled to 5 ppmvd NH_3, and consistent with the previously mentioned ARB guidance on ammonia slip, staff recommends a condition of certification establishing catalyst improvements if ammonia slip persistently exceeds 5 ppmvd (**AQ-SC9**).

Fumigation Impacts

There is the potential that higher short-term concentrations of pollutants may occur during fumigation conditions. Fumigation conditions are generally short-term in nature and only compared to 1-hour standards. The applicant analyzed the air quality impacts for normal emissions under fumigation conditions using the SCREEN3 Model (AFC Table 5.1-24, TID2009a). For comparison, the same operating scenario identified in the operational impact analysis is considered for fumigation. The short-term project impacts

during fumigation would not exceed the impacts for routine operation shown in **Air Quality Table 16** above. Therefore, no additional mitigation is required for fumigation impacts.

Commissioning-Phase Impacts

Commissioning impacts would occur over short-terms within the 28 days expected to be needed to complete the commissioning period. The commissioning emissions estimates are based on partial load operations before the emission control systems become operational, as in **Air Quality Table 11**. Impacts due to PM10, PM2.5, and SO_2 during commissioning would occur under similar exhaust conditions as those for startup while in routine operation because these emissions are proportional to fuel use. **Air Quality Table 17** shows that the commissioning-phase impacts of CO and NO_2 would be somewhat higher than those during routine operations. Commissioning-phase impacts to particulate matter and ozone concentrations would be addressed with the mitigation identified above for routine operations.

AIR QUALITY Table 17
A2PP, Commissioning-Phase Maximum Impacts (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
CO	1 hour	65.9	7,935	8,001	23,000	35
	8 hour	21.7	4,144	4,166	10,000	42
NO_2	1 hour [a]	66.6	118.7	185.25	339	55

Source: AFC Table 5.1-27 (TID2009a and SJVAPCD2010), with independent staff assessment for NO_2, December 2009.
Note: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output.

Visibility Impacts

A visibility analysis of the project's gaseous emissions would not be required because the TID A2PP project would not qualify as a new major stationary source under the federal Prevention of Significant Deterioration (PSD) permitting program. For projects subject to PSD review by the U.S. EPA, a visibility analysis would address the nearest federally-protected Class I area. The nearest Class I areas are as follows (AFC Appendix 5.1B, TID2009a):

- Yosemite National Park 98 kilometers (km)
- Emigrant Wilderness 104 km
- Pinnacles Wilderness 117 km
- Mokelumne Wilderness 123 km
- Desolation Wilderness 154 km
- Point Reyes National Seashore 165 km

Due to its distance from Class I areas being approximately 100 kilometers, and due to the potential emissions of the project being less than the PSD applicability thresholds, Energy Commission staff anticipates that the project’s impacts to visibility in Class I areas would be insignificant.

Mitigation for Routine Operation

Applicant's Proposed Mitigation

The A2PP includes a combination of BACT and emission reduction credits to mitigate air quality impacts. The equipment description, equipment operation, and emission control devices are provided in **Air Quality Project Description**.

Emission Controls

A2PP proposes two catalyst systems: the SCR and water injection system to reduce NOx; and the oxidation catalyst system to reduce CO and VOC. Operating exclusively with pipeline quality natural gas limits SOx and particulate matter emissions. Additionally, inlet air filters and lube oil vent filters would be used to minimize paritculate emissions. Appropriately sized stacks is also used to reduce ground-level concentrations of exhaust constituents.

Emission Offsets

In addition to emission control strategies included in the project design, SJVAPCD Rule 2201 requires A2PP to provide emission reduction credits to offset the new emissions of NOx, VOC and PM10. **Air Quality Table 18** summarizes the SJVAPCD Rule 2201 offset requirements for the A2PP, with offsets assumed to originate from shutdowns at sources located more than 15 miles away (distance offset ratio of 1.5-to-1). The SJVAPCD conducts a case-by-case analysis of requirements and distance ratios depending on the specific ERCs held by the applicant (SJVAPCD 2010).

AIR QUALITY Table 18
A2PP, SJVAPCD Offset Determination and Requirements (lb/yr)

Source	NOx	VOC	PM10	CO	SOx
Three CTGs	141,561	33,993	65,703	154,857	38,736
A2PP Potential to Emit	141,561	33,993	65,703	154,857	38,736
Offset Requirements					
Existing APP Potential Emissions	52,146	10,461	17,524	136,436	11,459
SJVAPCD Offset Threshold	20,000	20,000	29,200	200,000	54,750
Offsets Required by SJVAPCD for A2PP [a, b]	141,561	24,454	54,027	---	---
Offsets Required by SJVAPCD at A2PP [c]	212,342	36,682	81,042	---	---

Source: SJVAPCD 2010; Independent Staff Assessment.

Note: a. Emission offsets are not required for CO since the applicant has demonstrated to the satisfaction of the Air Pollution Control Officer (APCO) that the ambient air quality standards are not violated in the areas to be affected, and such emissions will be consistent with Reasonable Further Progress, and will not cause or contribute to a violation of the standards.

b. SJVAPCD's offsetting rules exempt sources that have potential emissions below the offset threshold, allowing a credit for VOC and PM10 from the existing APP in this case. This reduces the amount of offsets required by SJVAPCD for VOC and PM10 caused by A2PP. NOx emissions must be offset at the level of A2PP's potential to emit because existing APP's potential NOx emissions exceed the SVJAPCD offset threshold.

c. Includes a distance ratio factor of 1.5 for ERCs that would originate from sources over 15 miles away.

The proposed A2PP project would be required to surrender offsets according to the operating profile proposed by the applicant (AFC Appendix 5.1A, Tables 5.1A-4 and 5.1A-5, TID2009a). District conditions would limit the facility operation in terms of its

quarterly and annual emissions (Conditions of Certification **AQ-31** to **AQ-36**), its daily emissions (**AQ-28** and **AQ-29**), and its short-term normal operation (**AQ-21** and **AQ-25**), rather than through its heat input rate or other parameters.

Emission Offsets for Ozone Impact

Air Quality Table 19 summarizes NOx and VOC offset requirements and identifies the sources of offsets proposed by TID. The applicant holds NOx and VOC ERCs that it intends to use to satisfy the District offset requirements. Both NOx and VOC emissions are recognized precursors to the formation of ambient ozone, and NOx is also a recognized precursor to the formation of the nitrate fraction of fine particulate matter.

AIR QUALITY Table 19
A2PP, NOx and VOC Offset Holdings and Quarterly Offset Requirements (lb/qtr)

Name of Offset / Site of Reduction	ERC Number	Q1 (lb/qtr)	Q2 (lb/qtr)	Q3 (lb/qtr)	Q4 (lb/qtr)
NOx Offsets Held by TID					
Elk Hills, Tupman, CA	S-3113-2	55,800	55,800	55,800	55,800
NOx Mitigation Total	---	**55,800**	**55,800**	**55,800**	**55,800**
Proposed NOx Emissions	---	**34,905**	**35,292**	**35,682**	**35,682**
NOx Fully Offset?	---	Yes	Yes	Yes	Yes
VOC Offsets Held by TID					
E North Ave, Fresno, CA	C-1008-1	10,250	10,250	10,250	10,250
VOC Mitigation Total	---	**10,250**	**10,250**	**10,250**	**10,250**
Proposed VOC Emissions	---	**8,382**	**8,475**	**8,568**	**8,568**
VOC Fully Offset?	---	Yes	Yes	Yes	Yes

Source: SJVAPCD 2010; Independent Staff Assessment.

TID appears to be in compliance with the District's NOx and VOC offset requirements and would provide overall total ERCs for ozone precursors at an offset ratio of greater than one-to-one, which satisfies the CEQA mitigation requirements for ozone impacts as established by Energy Commission staff in recent fossil fuel-fired power plant cases, such as Avenal Energy (08-AFC-1).

Emission Offsets for Particulate Matter Impact

Air Quality Table 20 summarizes PM10 offset requirements and identifies the sources of PM10 offsets proposed by TID. These offsets are held by TID and are being offered as mitigation for the PM10/PM2.5 impacts. TID would use its holdings of SOx ERCs through an interpollutant trade to satisfy the District offset requirements for PM10 (SJVAPCD 2010).

AIR QUALITY Table 20
A2PP, PM10 and SOx Offset Holdings and Quarterly Offset Requirements (lb/qtr)

Name of Offset / Site of Reduction	ERC Number	Q1 (lb/qtr)	Q2 (lb/qtr)	Q3 (lb/qtr)	Q4 (lb/qtr)
PM10 Offsets Held by TID					
No ERCs	---	---	---	---	---
Surplus SOx ERCs (to offset PM10)	(below)	46,065	30,493	10,496	54,910
Convert Q4 ERC to Q3	---	---	---	6,064	-6,064
PM10 Mitigation Total	---	**46,065**	**30,493**	**16,560**	**48,846**
Proposed PM10 Emissions	---	**16,200**	**16,383**	**16,560**	**16,560**
PM10 Fully Offset?	---	Yes	Yes	Yes	Yes
SOx Offsets Held by TID					
Panama Ln, Bakersfield	S-3129-5	55,614	40,150	0	84,936
Convert Q4 ERC to Q3	---	---	---	20,261	-20,261
SOx Mitigation Total	---	**55,614**	**40,150**	**20,261**	**64,675**
Proposed SOx Emissions	---	**9,549**	**9,657**	**9,765**	**9,765**
SOx Fully Offset?	---	Yes	Yes	Yes	Yes

Source: SJVAPCD 2010; Independent Staff Assessment.

The applicant proposes to use SOx ERC certificate to offset PM10/PM2.5 increases associated with the project. The SJVAPCD allows this by establishing an interpollutant offset ratio (District Rule 2201, Section 4.13.3). SOx is accepted as one of the major precursors of PM10 and PM2.5 through reaction with ammonia to form ammonium sulfates. Reductions in SOx, particularly in areas that are ammonia rich such as the San Joaquin Valley, can reduce secondary particulate formation. However, the key issue is determining the appropriate interpollutant offset ratio, which depends on the existing levels of particulate matter precursors and the general atmospheric chemistry of the area in question. The SJVAPCD conducted a district-wide analysis in March 2009 that is attached with the Final Determination of Compliance for A2PP (SJVAPCD 2010), and the district-wide analysis concluded that a one-to-one interpollutant ratio would be protective of managing regional PM10/PM2.5 impacts and progress towards attainment. However, the SJVAPCD's use of a one-to-one interpollutant ratio for Rule 2201 compliance leads to fewer SOx reductions for particulate matter than ratios used by SJVAPCD in some past cases. This issue is discussed further in **Cumulative Impacts and Mitigation**.

A2PP appears to be in compliance with the District's PM10 offset requirements and would provide overall total PM10/PM2.5 precursor ERCs at an offset ratio of greater than one-to-one, which satisfies the CEQA mitigation requirements for particulate matter impacts as established by Energy Commission staff in recent fossil fuel-fired power plant cases, such as Avenal Energy (08-AFC-1).

Adequacy of Proposed Mitigation

Energy Commission staff have long held that emission reductions need to be provided for all nonattainment pollutants and their precursors at a minimum overall one-to-one ratio of annual operating emissions. For this project, the District's offset requirements would meet or exceed that minimum offsetting goal for all ozone and particulate matter impacts.

The offsets shown in **Air Quality Table 19** and **Table 20** demonstrate that TID owns and would be required by the SJVAPCD to surrender ERCs in sufficient quantities to offset the project's NOx, VOC, PM10, and SOx emissions, per District requirements and Energy Commission staff policy. Although PM2.5 emissions are not required to be offset separately from PM10 emissions, staff notes that the annual total offsets for PM10 would fully offset PM2.5 emissions. How the offsets provide PM2.5 mitigation is discussed separately in **Secondary Pollutant Impacts**.

While the one-to-one interpollutant offset ratio for SOx and PM10 is lower than what has been historically required by the District on other cases, Energy Commission staff's longstanding position is that all nonattainment pollutant and precursor emissions must be offset by at least one-to-one. Therefore, the proposed emission offset package would mitigate all project air quality impacts to a less than significant level.

Staff's review of the offset package was determined solely based on the merits of this case, including the District offset requirements, the project's emission limits, the specific ERCs proposed, and ambient air quality considerations of the region, and does not in any way provide a precedence or obligation for the acceptance of offset proposals for any other current or future licensing cases.

Staff Proposed Mitigation

Staff proposes Conditions of Certification **AQ-SC6** to ensure that the license is amended as necessary to incorporate future changes to the air quality permits and to ensure ongoing compliance during commissioning and routine operation through quarterly reports (**AQ-SC8**). Staff also proposes a Condition of Certification (**AQ-SC7**) to ensure that significant impacts of ozone and PM10/PM2.5 precursors would be mitigated with the quantity of SJVAPCD offsets specified by staff and to ensure agency consultation if substitutions are made to the credits.

Cumulative Impacts and Mitigation

"Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, §15355). Such impacts can be relatively minor and incremental yet still be significant because of the existing environmental background, particularly when considering other closely related past, present, and reasonably foreseeable future projects.

Criteria pollutants have impacts that are usually (though not always) cumulative by their nature. Rarely will a project itself cause a violation of a federal or state criteria pollutant standard. However, many new sources contribute to violations of criteria pollutant standards because of elevated background conditions. Air districts attempt to reduce background criteria pollutant levels by adopting attainment plans, which are multi-faceted programmatic approaches to attainment. Attainment plans typically include new source review requirements that provide offsets and use Best Available Control Technology, combined with more stringent emissions controls on existing sources.

The discussion of cumulative air quality impacts includes the following three analyses:

- a summary of projections for criteria pollutants by the air district and the air district's programmatic efforts to abate such pollution;

- an analysis of the project's "localized cumulative impacts" from direct emissions locally when combined with other local major emission sources; and
- a discussion of greenhouse gas emissions and global climate change impacts (in **AIR QUALITY APPENDIX AIR-1**).

Summary of Projections

The federal and California Clean Air Acts direct local air quality management agencies to implement plans and programs that lead to attainment and maintenance of the ambient air quality standards. The New Source Review program administered by SJVAPCD and other programs for reducing emissions from mobile sources or area-wide sources are part of air quality management plans.

Ozone

The **2004 Extreme Ozone Attainment Demonstration Plan** illustrates how the SJVAPCD would attain the federal 1-hour ozone standard that was revoked in 2005. This plan includes elements that are the foundation for later ozone plans.

The **2007 Ozone Plan** to attain the federal 8-hour ozone standard was approved by ARB on June 14, 2007. This plan would reduce ozone and particulate matter levels in the region, primarily by achieving a 75% reduction in NOx emissions by 2023. Achieving such dramatic reductions would affect all sectors of the region's economy (SJVAPCD 2007a). The plan relies on four main approaches: tighter District regulations for stationary sources, wider use of incentive-based measures (like the Carl Moyer Program) to accelerate deployment of cleaner sources, new "innovative" programs for trip-reduction and energy conservation, and expanded controls on mobile source tailpipe emissions.

The proposed A2PP is subject to the current SJVAPCD rules and regulations that specify performance standards, offset requirements, and emission control requirements for stationary sources. The regulations also include requirements for obtaining Authority to Construct (ATC) permits and subsequent operating permits. These regulations apply to A2PP and all other projects with emission sources. In general, triennial updates of the attainment plans ensure that population, employment, and transportation trends in the region are taken into account, and compliance with SJVAPCD rules and regulations ensures consistency with the regional air quality management plans. The SJVAPCD has demonstrated in its analysis of the offset requirements and other District rules that the proposed A2PP would be likely to comply with the recently adopted plans through regulatory compliance. Because the project would control ozone precursor emissions and use ERCs to fully offset ozone precursors as required by existing rules and regulations, the project would not be likely to conflict with the District's 2007 Ozone Plan or regional ozone attainment goals. This facility is likely to become operational before this ozone plan is updated, if this is needed due to changes in the federal ambient air quality ozone standard.

Particulate Matter

The **2007 PM10 Maintenance Plan** illustrates how the SJVAPCD intends to continue the efforts of the **2003 PM10 Plan** and **2006 PM10 Plan** that implemented aggressive PM10 controls in the region, including Reasonably Available Control Measures (RACM)

for large existing sources of PM10 and fugitive dust. The 2007 PM10 Maintenance Plan includes a request for reclassification to “attainment” for the federal PM10 standard, and it provides for continued attainment for 10 year from the designation. In November 2008, the U.S. EPA redesignated the SJVAPCD to attainment for the federal PM10 standard (73 FR 66759, November 12, 2008).

The **2008 PM2.5 Plan** was adopted by the SJVAPCD Governing Board on April 30, 2008, and it includes measures for attaining the 1997 and 2006 federal PM2.5 standards. The 2008 PM2.5 Plan shows that emission reductions of NOx, directly emitted PM2.5, and SO_2 are needed to demonstrate attainment of the PM2.5 NAAQS in the San Joaquin Valley (p. 6-1 of plan).

Energy Commission staff remains concerned that the proposed A2PP project could interfere with the attainment effort of the 2008 PM2.5 Plan if it relies on SOx emission reduction credits without an adequate trading ratio for allowing PM2.5 increases. The SJVAPCD has determined that the offset requirements would be satisfied so that no net increase of PM10 would occur (SJVAPCD 2010). Interpollutant trading is allowed with “the appropriate scientific demonstration of an adequate trading ratio” (Rule 2201, Section 4.13), and the SJVAPCD 2007 PM10 Maintenance Plan (see Appendix E of the Maintenance Plan) indicates that the minimum ratio would be one-to-one with higher interpollutant ratios if appropriate under Rule 2201. The one-to-one ratio was developed by the SJVAPCD based on modeling conducted in support of the 2008 PM2.5 Plan, but although implementation of trading under District Rule 2201 is subject to federal oversight, there is no evidence in the record indicating whether the methods used by the SJVAPCD in developing the ratio have been specifically reviewed and/or approved by U.S. Environmental Protection Agency.

The U.S. EPA review of the SJVAPCD’s 2008 PM2.5 Plan is ongoing, and the review may lead to a different conclusion on an appropriate interpollutant trading ratio for the SJVAPCD. Although there is no formal federal endorsement of the District’s interpollutant trading approach, Energy Commission staff is able to conclude that the A2PP project would not be likely to conflict with regional particulate matter attainment goals. Staff recognizes that the attainment plan has been previously adopted by ARB, and the SJVAPCD has determined (SJVAPCD 2010) that the interpollutant trading ratio is appropriate. The SJVAPCD shows that A2PP is likely to comply with the particulate matter plans by meeting its permit requirements and complying with the existing applicable rules and regulations.

Localized Cumulative Impacts

The proposed project and other reasonably foreseeable projects could cause impacts that would be locally combined if present and future projects would introduce stationary sources that are not included in the “background” conditions. Under CEQA, reasonably foreseeable future projects are usually those that are either currently under construction or in the process of being approved by a local air district or municipality. Projects that have not yet entered the approval process do not ordinarily qualify as “foreseeable” since the detailed information needed to conduct this analysis is not available. Sources that are presently operational are included in the background concentrations. Background conditions also take into account the effects of non-stationary sources.

Projects with stationary sources located up to six miles from the proposed project site usually need to be considered by the analysis. TID requested that the SJVAPCD identify potential new stationary sources within six miles of the A2PP (Response to Workshop Queries and DR 8 and 9, CH2M2009f). The SJVAPCD reported 72 exsisting facilities and 159 proposed projects. In addition to the Almond Power Plant and A2PP, only five projects would involve emissions increases of more than 10 pounds per day of any contaminant other than VOC. Although cumulative sources emitting exclusively VOC would contribute to the project-related impacts to secondary ozone formation, these impacts are not modeled in this Staff Assessment because there are no agency-recommended models or procedures for quantifying the cumulative ozone impacts.

The A2PP cumulative analysis considers the existing Almond Power Plant (AFC Appendix 5.1G, TID2009a), and the SJVAPCD response on foreseeable sources identified the following facilities and stationary sources (Response to DR 8 and 9):

- **Existing APP.** The existing APP, adjacent to the proposed A2PP, would experience a reduction in operation (Response to DR 2 and 15, CH2M2009f). However, the existing APP stationary sources included in A2PP's analysis of cumulative impacts is based on current operational patterns, results shown in **Air Quality Table 21**.
- **Facility #N-1090522 (Stanislaus County Bldg. Maint.).** Proposed a 900 hp Caterpillar Model C27 diesel-fired emergency standby IC engine.
- **Facility #N-1081108 (Conagra Foods).** Proposed a new vegetable branding and roasting operation served by one 0.576 MMBtu/hr natural gas fired ribbon burner (branding) and five 0.576 MMBtu/hr natural gas fired ribbon burners (roasting).
- **Facility #N-1804279 (Ceres Memorial Park).** Proposed a new Hartwick Combustion Technologies, Inc. Model APEX-250 crematory incinerator consisting of a 0.6 MMBtu/hr primary burner and a 1.2 MMBtu/hr secondary burner (afterburner).
- **Facility #N-1801297 (Winco Foods).** 1) Proposed a 480 hp Caterpillar Model C9 Tier 3 certified diesel-fired emergency standby IC engine powering an electric generator. 2) Proposed a 1,372 hp Caterpillar Model C32 Tier 2 certified diesel-fired emergency standby IC engine powering an electric generator, respectively

The maximum modeled cumulative impacts are presented below in **Air Quality Table 21**. The total impact is conservatively estimated by the maximum modeled impact plus existing maximum background pollutant levels.

AIR QUALITY Table 21
A2PP, Ambient Air Quality Impacts from Cumulative Sources (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	LimitingStandard	Percent of Standard
PM10	24 hour	8.2	**111.1**	**119.3**	50	**239**
	Annual	1.4	**31.7**	**33.1**	20	**166**
PM2.5	24 hour	8.2	**71**	**79.2**	35	**226**
	Annual	1.4	**16.0**	**17.4**	12	**145**
CO	1 hour	66.1	7,935	8,001.1	23,000	35
	8 hour	144.7	4,144	4,288.7	10,000	43
NO_2	1 hour [a]	167.0	118.7	285.7	339	84
	Annual	0.6	24.7	25.3	57	44
SO_2	1 hour	3.6	47.2	50.8	655	8
	24 hour	1.5	18.4	19.9	105	19
	Annual	0.5	5.3	5.8	80	7

Source: Response to DR 8 and 9 (CH2M2009f), with independent staff assessment for NO_2, December 2009.
Notes: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output.

Compared with the impacts from the proposed A2PP project alone, maximum cumulative impacts caused by the existing APP would be substantially higher for PM10/PM2.5. The combined PM10/PM2.5 impacts caused by A2PP, the existing APP and other projects would be dominated by A2PP. Although the propsed A2PP causes higher cumulative impacts than the existing APP for NO_2, the total NO_2 impacts would be dominated by other projects. Modeled concentrations of NO_2 are highest at the other sources, potentially exceeding newly-established, but not yet effective, federal 1-hour NO_2 standard.

Staff believes that particulate matter emissions from A2PP would be cumulatively considerable because they would contribute to existing violations of the PM10 and PM2.5 ambient air quality standards. Secondary impacts would also be cumulatively considerable for PM10, PM2.5, and ozone because emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would contribute to existing violations of the PM10, PM2.5, and ozone standards. To address the contribution caused by A2PP to cumulative particulate matter and ozone impacts, mitigation would offset all nonattainment pollutants and their precursors at a minimum ratio of one-to-one.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The Preliminary Determination of Compliance (PDOC) for A2PP was dated December 2, 2009 (SJVAPCD 2009c) and the Final Determination of Compliance (FDOC) was released and dated February 16, 2010 (SJVAPCD 2010). Compliance with all District Rules and Regulations was demonstrated to the SJVAPCD's satisfaction in the PDOC and FDOC, and the FDOC conditions are presented in the Conditions of Certification. The applicant filed only minor comments on the PDOC.

FEDERAL

40 CFR 51, Nonattainment New Source Review. The FDOC includes conditions that would implement the federal nonattainment New Source Review (NSR) permit for A2PP.

40 CFR 52.21, Prevention of Significant Deterioration. The A2PP project would not be subject to permit requirements under the Prevention of Significant Deterioration (PSD) program because A2PP would not qualify as a new major stationary source of NO_2, CO, or PM10. If, in the future, the project owner changes the project, staff proposes Condition of Certification **AQ-SC6** to ensure that the owner promptly notifies the Energy Commission to incorporate changes in permit conditions, if any.

40 CFR 60, NSPS Subpart KKKK. The three CTGs proposed for A2PP would be likely to comply with the applicable emission limits by achieving a NOx emission rate of 2.5 ppmvd over any one-hour period except during startup and shutdown periods and during combustor tuning.

STATE

A2PP has demonstrated that the project would comply with Section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury. Compliance with the FDOC (SJVAPCD 2010) and the Energy Commission staff's Conditions of Certification enable staff's affirmative finding.

LOCAL

The SJVAPCD issued the PDOC (SJVAPCD 2009c) and FDOC (SJVAPCD 2010) stating that the proposed project is expected to comply with all applicable District rules and regulations. The District rules and regulations specify the emissions control and offset requirements for the new sources associated with A2PP. The SJVAPCD has determined that the project would use the Best Available Control Technology (BACT), and the emission reduction credits (ERCs) approved and certified by the District would fully offset project nonattainment pollutant (including precursors) emissions so that they would be consistent with District rules and regulations.

SJVAPCD Rules 2201 and 2301, New Source Review and Offsets. Staff identified concerns on whether the ERCs would be exchanged with an interpollutant ratio that is consistent with U.S. EPA recommendations, as discussed under **Air Quality Cumulative Impacts**.

CONCLUSIONS

- Construction impacts would contribute to violations of the ozone, PM10, and PM2.5 ambient air quality standards. Staff recommends Conditions of Certification **AQ-SC1** to **AQ-SC5** to mitigate the project construction-phase impacts to a less than significant level.
- Operation of the project would comply with applicable SJVAPCD rules and regulations, including New Source Review, Best Available Control Technology (BACT) requirements, and requirements to offset emission increases.

- The project would neither cause new violations of any NO_2, CO, or SO_2 ambient air quality standards nor contribute to existing violations for these pollutants. Therefore, the project's direct NO_2, CO, and SO_2 impacts are less than significant. However, this assessment does not include evaluation of this project's compliance with the 2010 federal 1-hour NO_2 standard because the standard was promulgated after this application was filed, and there is a corresponding lack of guidance and modeling tools for conducting impact analyses and determining existing background concentrations for compliance with this standard.
- The project NOx and VOC emissions would contribute to existing violations of state and federal ozone ambient air quality standards. The ozone precursor offsets required by SJVAPCD and shown in Condition of Certification **AQ-SC7** would mitigate the ozone impact to a less than significant level.
- The project PM10 and PM2.5 emissions and the PM10/PM2.5 precursor emissions of SOx would contribute to the existing violations of state and federal PM10 and PM2.5 ambient air quality standards. The SJVAPCD requirements to offset PM10 would be satisfied by surrendering SOx ERCs under an interpollutant exchange, and these ERCs would mitigate the PM10/PM2.5 impacts to a less than significant level. The offsets would be in sufficient quantities to satisfy Energy Commission staff's longstanding position that all nonattainment pollutant and precursor emissions be offset at least one-to-one. Future projects may be subject to different interpollutant offset ratios because the U.S. EPA review of the SJVAPCD's 2008 PM2.5 Plan is ongoing, and there is no evidence that the District's interpollutant trading ratios have been specifically reviewed and/or approved by U.S. EPA (see **Cumulative Impacts and Mitigation**).
- Staff recommends Condition of Certification **AQ-SC9** to limit ammonia slip from the simple-cycle system to the extent feasible.
- Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in **Air Quality Appendix AIR-1**. The A2PP would exceed the Emission Performance Standard established by SB 1368 for base load generation. However, as a simple-cycle power plant, A2PP is not designed or intended for base load generation and is therefore not subject to the Emission Performance Standard. The project would be subject to the Air Resources Board mandatory GHG reporting requirements and any GHG reduction or trading requirements developed by the ARB as GHG regulations are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

Staff-Recommended Conditions of Certification

Staff proposes the following conditions of certification (identified as the **AQ-SCx** series of conditions) to provide mitigation during the construction phase of the project.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with conditions **AQ-SC3, AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM delegates.

The AQCMM and AQCMM delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the compliance project manager (CPM).

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

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

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

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

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

b. No vehicle shall exceed 15 miles per hour within the construction site.

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

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

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

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

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

h. Construction areas adjacent to any paved roadway shall be provided with

sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.

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

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

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

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

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

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

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

Step 1: Within 15 minutes of making such a determination, the AQCMM or delegate shall direct more intensive application of the existing mitigation methods.

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

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

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

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

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

b. All construction diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless certified by the on-site AQCMM that such engine is not available for a particular item of equipment. This good faith effort shall be documented with signed written correspondence by the appropriate construction contractors, along with documented correspondence with at least two construction equipment rental firms. In the event that a Tier 3 engine is not available for any off-road equipment larger than 50 hp, that equipment shall be equipped with a Tier 2 engine or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 2 levels, unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is “not practical” for the following, as well as other, reasons:

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question to Tier 2 equivalent emission levels and either a Tier 1 engine or the highest level of available control is being used; or

2. The construction equipment is intended to be on site for five days or less.

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

4. Equipment owned by specialty subcontractors may be granted an exemption, for single equipment items on a case-by-case basis, if it can be demonstrated that extreme financial hardship would occur if the specialty subcontractor had to rent replacement equipment, or if it can be demonstrated that a specialized equipment item is not available by rental.

c. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and the AQCMM demonstrates that one of the following conditions exists:

    1. The use of the control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.

    2. The control device is causing or is reasonably expected to cause significant engine damage.

    3. The control device is causing or is reasonably expected to cause a significant risk to workers or the public.

    4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

d. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

e. All diesel heavy construction equipment shall not idle for more than five minutes, to the extent practical.

f. Construction equipment will employ electric motors when feasible.

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

AQ-SC6 The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any proposed air permit modification to the CPM within five working days of either: 1) submittal by the project owner to an

agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC7 The project owner shall provide emission reductions in the form of offsets or emission reduction credits (ERCs) in the quantities of at least 141,561 lb NOx, 33,993 lb VOC, 65,703 lb PM10, and 38,736 lb SOx emissions. The project owner shall demonstrate that the reductions are provided in the form required by the District.

The project owner shall surrender the ERCs from among those that are listed in the District Final Determination of Compliance Conditions (SJVAPCD 2010) or a modified list, as allowed by this condition. If additional ERCs are submitted, the project owner shall submit an updated table including the additional ERCs to the CPM. The project owner shall request CPM approval for any substitutions, modifications, or additions to the listed credits.

The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, and that the requested change(s) will not cause the project to result in a significant environmental impact. The District must also confirm that each requested change is consistent with applicable federal and state laws and regulations.

Verification: The project owner shall submit to the CPM records showing that the project's offset requirements have been met prior to initiating construction. If the CPM approves a substitution or modification to the list of ERCs, the CPM shall file a statement of the approval with the project owner and the Energy Commission docket. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC8 The project owner shall submit to the CPM quarterly operation reports that include operational and emissions information as necessary to demonstrate compliance with the conditions of certification. The quarterly operation report shall specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit quarterly operation reports to the CPM and APCO no later than 30 days following the end of each calendar quarter. This information shall be maintained on site for a minimum of five years and shall be provided to the CPM and District personnel upon request.

AQ-SC9 The ammonia (NH3) emissions from each combustion turbine (N-3299-4-0, '-5-0, -6-0) shall not exceed 10.0 ppmvd @ 15% O2 averaged over a 24 hour rolling average. In addition, the selective catalytic reduction (SCR) system catalyst shall be replaced, repaired, or otherwise reconditioned within 12 months if the ammonia slip exceeds 5 ppmvd @ 15% O2 over a 24 hour rolling average. The SCR ammonia injection grid replacement, repair, or reconditioning scheduled event may be cancelled if the owner or operator can demonstrate that, subsequent to the initial exceedance, the ammonia slip consistently remains below 5 ppmvd @ 15% O2 averaged over 24 hours, and that the initial exceedance does not accurately indicate expected future operating conditions.

Verification: The ammonia injection rate shall be monitored, and ammonia emissions calculated and recorded hourly (**AQ-26** and **AQ-27**). A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

District Final Determination Of Compliance Conditions (SJVAPCD 2010)

The following conditions, **AQ-1** to **AQ-64**, apply to each of the three LM6000 PG SPRINT CTGs individually, and conditions **AQ-65** to **AQ-95** apply to the proposed A2PP facility as a whole. The SJVAPCD released its Final Determination of Compliance dated February 16, 2010, and this staff assessment reflects the SJVAPCD conditions.

EQUIPMENT DESCRIPTION, UNITS N-3299-4-0, N-3299-5-0, and N-3299-6-0

54.2 MW nominal (ISO) rating simple-cycle peak-demand power generating system consisting of a 523.2 MMBTU/HR (at nominal ISO MW rating) General Electric, aero derivative, model LM6000 PG Sprint, natural gas-fired combustion turbine generator with a water spray premixed combustion system, an oxidation catalyst and a selective catalytic reduction (SCR) system with ammonia injection.

AQ-1 The permittee shall not begin actual on-site construction of the equipment authorized by this Authority to Construct until the lead agency satisfies the requirements of the California Environmental Quality Act (CEQA). [California Environmental Quality Act]

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

AQ-2 This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule]

Verification: No verification necessary.

AQ-3 Prior to operating with modifications authorized by this Authority to Construct, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4]

Verification: The project owner shall submit to both the District and CPM the Title V Operating Permit application prior to operation.

AQ-4 The owner or operator shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the District's satisfaction that the longer reporting period was necessary. [District Rule 1100]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ SC8**).

AQ-5 The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a

description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations. [District Rule 1100]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-6 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-7 The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap (flapper ok), roof overhang, or any other obstruction. [District Rule 4102]

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

AQ-8 Particulate matter emissions from the gas turbine system shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner shall submit the results of source tests to both the District and CPM in accordance with **AQ-46**.

AQ-9 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101]

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

AQ-10 APCO or an authorized representative shall be allowed to inspect, as determined to be necessary, the required monitoring devices to ensure that such devices are functioning properly. [District Rule 1080]

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

AQ-11 Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the construction contractor to ensure safe and reliable steady state operation of the gas turbine and associated electrical delivery systems. [District Rule 2201]

Verification: No verification necessary.

AQ-12 Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a gas turbine is first fired, whichever occurs first. The commissioning period shall terminate when the plant has completed initial

source testing, completed final plant tuning, and is available for commercial operation. [District Rule 2201]

Verification: The project owner shall submit a commissioning plan to the CPM and APCO for approval at least 30 days prior to first firing of the gas turbine describing the procedures to be followed during the commissioning period and the anticipated duration of each commissioning activity.

AQ-13 Emission rates from the gas turbine system during the commissioning period shall not exceed any of the following limits: NOx (as NO2) - 40.40 lb/hr and 969.6 lb/day; VOC (as CH4) - 8.41 lb/hr and 201.8 lb/day; CO - 40.00 lb/hr and 704.6 lb/day; PM10 - 2.50 lb/hr and 60.0 lb/day; or SOx (as SO2) - 1.56 lb/hr and 37.4 lb/day. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-14 During commissioning period, NOx and CO emission rate shall be monitored using installed and calibrated Continuous Emission Monitoring Systems (CEMS). [District Rule 2201]

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-12**.

AQ-15 The total mass emissions of NOx, VOC, CO, PM10 and SOx that are emitted during the commissioning period shall accrue towards the quarterly emission limits. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-16 During commissioning period, the owner or operator shall keep records of the natural gas fuel combusted in the gas turbine system on an hourly and daily basis. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-17 Startup of this gas turbine system shall not exceed one hour per event. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the District and CPM the startup event duration data demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-18 Shutdown of this gas turbine system shall not exceed one hour per event. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the District and CPM the shutdown event duration data demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-19 During all types of operation (with an exception of ammonia injection tuning prior to the initial source test during the commissioning period), including startup and shutdown periods, ammonia injection into the SCR system shall occur once the minimum temperature at the catalyst face has been reached to ensure NOx emission reductions can occur with a reasonable level of ammonia slip. The minimum catalyst face temperature shall be determined during the final design phase of this project and shall be submitted to the District at least 30 days prior to commencement of construction. [District Rule 2201]

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

AQ-20 The District shall administratively add the minimum temperature limitation established pursuant to the above condition in the final Permit to Operate. The District may administratively modify the temperature as necessary following any replacement of the SCR catalyst material. [District Rule 2201]

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

AQ-21 During start-up or shutdown period, the emissions shall not exceed any of the following limits: NOx (as NO2) - 25.00 lb/hr; CO - 40.00 lb/hr; VOC (as methane) - 2.00 lb/hr; PM10 - 2.50 lb/hr; SOX (as SO2) - 1.56 lb/hr; or NH3 - 7.44 lb/hr. [District Rules 2201 and 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-22 Start-up is defined as the period of time during which a unit is brought from a shutdown status to its operating temperature and pressure, including the time required by the unit's emission control system to reach full operation. [District Rule 4703, 3.29]

Verification: No verification necessary.

AQ-23 Shutdown is defined as the period of time during which a unit is taken from an operational to a non-operational status ending when the fuel supply to the unit is completely turned off. [District Rule 4703, 3.26]

Verification: No verification necessary.

AQ-24 The emission control systems shall be in operation and emissions shall be minimized insofar as technologically feasible during startup and shutdown. [District Rule 4703, 5.3.2]

Verification: The project owner shall submit to the District and CPM the startup and shutdown event duration data demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-25 Except during startup and shutdown periods, emissions from the gas turbine system shall not exceed any of the following limits: NOx (as NO2) - 5.02 lb/hr

and 2.5 ppmvd @ 15% O2; CO - 4.89 lb/hr and 4.0 ppmvd @ 15% O2; VOC (as methane) - 1.40 lb/hr and 2.0 ppmvd @ 15% O2; PM10 - 2.50 lb/hr; or SOx (as SO2) - 1.56 lb/hr. NOx (as NO2) emission limits are based on 1-hour rolling average period. All other emission limits are based on 3-hour rolling average period. [District Rules 2201, 4001 and 4703]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-26 NH3 emissions shall not exceed 10.0 ppmvd @ 15% O2 over a 24-hour rolling average period. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-27 Each 3-hour rolling average period will be compiled from the three most recent one hour periods. Each one hour period shall commence on the hour. Each one hour period in a twenty-four hour rolling average for ammonia slip will commence on the hour. The twenty-four hour rolling average shall be calculated using the most recent twenty-four one-hour periods. [District Rule 2201]

Verification: No verification necessary.

AQ-28 Emissions from the gas turbine system, on days when a startup and/or shutdown occurs, shall not exceed the following limits: NOx (as NO2) - 160.4 lb/day; CO - 187.6 lb/day; VOC - 34.8 lb/day; PM10 - 60.0 lb/day; SOx (as SO2) - 37.4 lb/day, or NH3 - 178.6 lb/day. Daily emissions shall be compiled for a twenty-four hour period starting and ending at twelve-midnight. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-29 Emissions from the gas turbine system, on days when a startup and/or shutdown does not occur, shall not exceed the following: NOx (as NO2) - 120.5 lb/day; CO - 117.4 lb/day; VOC - 33.6 lb/day; PM10 - 60.0 lb/day; SOx (as SO2) - 37.4 lb/day, or NH3 - 178.6 lb/day. Daily emissions shall be compiled for a twenty-four hour period starting and ending at twelve-midnight. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-30 Gas turbine system shall be fired on PUC-regulated natural gas with a sulfur content of no greater than 1.0 grain of sulfur compounds (as S) per 100 dscf of natural gas. [District Rule 2201 and 40 CFR 60.4330(a)(2)]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-31 NOx (as NO2) emissions from this gas turbine system shall not exceed any of the following: 1st quarter: 11,635 lb; 2nd quarter: 11,764 lb; 3rd quarter: 11,894 lb; 4th quarter: 11,894 lb. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-32 CO emissions from this gas turbine system shall not exceed any of the following: 1st quarter: 12,728 lb; 2nd quarter: 12,869 lb; 3rd quarter: 13,011 lb; 4th quarter: 13,011 lb. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-33 VOC emissions from this gas turbine system shall not exceed any of the following: 1st quarter: 2,794 lb; 2nd quarter: 2,825 lb; 3rd quarter: 2,856 lb; 4th quarter: 2,856 lb. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-34 NH3 emissions from the SCR system associated with this gas turbine system shall not exceed any of the following: 1st quarter: 15,181 lb; 2nd quarter: 15,349 lb; 3rd quarter: 15,517 lb; 4th quarter: 15,517 lb. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-35 PM10 emissions from this gas turbine system shall not exceed any of the following: 1st quarter: 5,400 lb; 2nd quarter: 5,461 lb; 3rd quarter: 5,520 lb; 4th quarter: 5,520 lb. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-36 SOx (as SO2) emissions from the gas turbine system shall not exceed any of the following: 1st quarter: 3,183 lb; 2nd quarter: 3,219 lb; 3rd quarter: 3,255 lb; 4th quarter: 3,255 lb. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-37 A water injection system, a selective catalytic reduction (SCR) system and an oxidation catalyst shall serve this gas turbine system. [District Rule 2201]

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

AQ-38 The gas turbine engine and generator lube oil vents shall be equipped with mist eliminators or equivalent technology sufficient to limit the visible emissions from the lube oil vents to not exceed 5% opacity, except for a period not exceeding three minutes in any one hour. [District Rule 2201]

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

AQ-39 Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]

Verification: The project owner shall submit the proposed source test plan or protocol for the source tests 15 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 30 days prior to the proposed source test date and time.

AQ-40 Source testing shall be witnessed or authorized by District personnel and samples shall be collected by a California Air Resources Board (CARB) certified testing laboratory or a CARB certified source testing firm. [District Rule 1081]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-39**.

AQ-41 Source testing to measure startup and shutdown NOx, CO, and VOC mass emission rates shall be conducted before the end of the commissioning period and at least once every seven years thereafter. CEM relative accuracy for NOx and CO shall be determined during startup and shutdown source testing in accordance with 40 CFR 60, Appendix F (Relative Accuracy Audit). If CEM data is not certifiable to determine compliance with NOx and CO startup emission limits, then startup and shutdown NOx and CO testing shall be conducted every 12 months. If an annual startup and shutdown NOx and CO relative accuracy audit demonstrates that the CEM data is certifiable, the startup and shutdown NOx and CO testing frequency shall return to the once every seven years schedule. [District Rule 1081]

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-39**). Testing for startup and shutdown emissions shall be conducted upon initial operation and at least once every seven years.

AQ-42 Source testing to determine compliance with the NOx, CO, VOC and NH3 emission rates (lb/hr and ppmvd @ 15% O2) and PM10 emission rate (lb/hr) shall be conducted before the end of commissioning period and at least once

every 12 months thereafter. [District Rules 2201 and 4703, 40 CFR 60.4400(a)]

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-39**). Testing for steady-state emissions shall be conducted upon initial operation and at least once every 12 months.

AQ-43 The sulfur content of each fuel source shall be: (i) documented in a valid purchase contract, a supplier certification, a tariff sheet or transportation contract, or (ii) monitored within 60 days after the end of commissioning period and weekly thereafter. If the sulfur content is less than or equal to 1.0 gr/100 dscf for eight consecutive weeks, then the monitoring frequency shall be every six months. If the result of any six month monitoring demonstrates that the fuel does not meet the fuel sulfur content limit, weekly monitoring shall resume until compliance is demonstrated for eight consecutive weeks. [District Rule 2201 and 40 CFR 60.4360, 60.4365(a) and 60.4370(c)]

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-39**). Testing for steady-state emissions shall be conducted upon initial operation and at least once every 12 months.

AQ-44 The following test methods shall be used: NOx - EPA Method 7E or 20 or CARB Method 100; CO - EPA Method 10 or 10B or CARB Method 100; VOC - EPA Method 18 or 25; PM10 - EPA Method 5 (front half and back half) or 201 and 202a; ammonia - BAAQMD ST-1B; and O2 - EPA Method 3, 3A, or 20 or CARB Method 100. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4703, 40 CFR 60.4400(1)(i)]

Verification: The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval in accordance with condition **AQ-39**.

AQ-45 Fuel sulfur content shall be monitored using one of the following methods: ASTM Methods D1072, D3246, D4084, D4468, D4810, D6228, D6667 or Gas Processors Association Standard 2377. [40 CFR 60.4415(a)(1)(i)]

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-46 The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081]

Verification: The project owner shall submit the report of the source test results to both the District and CPM within 60 days of the last day of tests.

AQ-47 A non-resettable, totalizing mass or volumetric fuel flow meter to measure the amount of natural gas combusted in the unit shall be installed, utilized and maintained. [District Rules 2201 and 4703]

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

AQ-48 The owner or operator shall install, certify, maintain, operate and quality-assure a Continuous Emission Monitoring System (CEMS) which continuously measures and records the exhaust gas NOx, CO and O2 concentrations. Continuous emissions monitor(s) shall monitor emissions during all types of operation, including during startup and shutdown periods, provided the CEMS passes the relative accuracy requirement for startups and shutdowns specified herein. If relative accuracy of CEMS cannot be demonstrated during startup conditions, CEMS results during startup and shutdown events shall be replaced with startup emission rates obtained from source testing to determine compliance with emission limits contained in this document. [District Rules 1080, 2201 and 4703, 40 CFR 60.4340(b)(1) and 40 CFR 60.4345(a)]

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

AQ-49 The NOx and O2 CEMS shall be installed and certified in accordance with the requirements of 40 CFR Part 75. The CO CEMS shall meet the requirements in 40 CFR 60, Appendix F Procedure 1 and Part 60, Appendix B Performance Specification 4A (PS 4A), or shall meet equivalent specifications established by mutual agreement of the District, the CARB, and the EPA. [District Rule 1080 and 40 CFR 60.4345(a)]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-50 The CEMS shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each 15-minute quadrant of the hour or shall meet equivalent specifications established by mutual agreement of the District, the CARB and the EPA. [District Rule 1080 and 40 CFR 60.4345(b)]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-51 The CEMS data shall be reduced to hourly averages as specified in §60.13(h) and in accordance with §60.4350, or by other methods deemed equivalent by mutual agreement with the District, the CARB, and the EPA. [District Rule 1080 and 40 CFR 60.4350]

Verification: The project owner shall submit to the CPM and APCO CEMS data reduced in compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-52 In accordance with 40 CFR Part 60, Appendix F, 5.1, the CO CEMS must be audited at least once each calendar quarter, by conducting cylinder gas audits (CGA) or relative accuracy audits (RAA). CGA or RAA may be

conducted three of four calendar quarters, but no more than three calendar quarters in succession. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-53 The owner/operator shall perform a RATA for CO as specified by 40 CFR Part 60, Appendix F, 5.1.1, at least once every four calendar quarters. The permittee shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-54 The NOx and O2 CEMS shall be audited in accordance with the applicable requirements of 40 CFR Part 75. Linearity reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

Verification: The project owner shall submit to the CPM and APCO CEMS audits demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

AQ-55 Upon written notice from the District, the owner or operator shall provide a summary of the data obtained from the CEMS. This summary shall be in the form and the manner prescribed by the District. [District Rule 1080]

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

AQ-56 The facility shall install and maintain equipment, facilities, and systems compatible with the District's CEMS data polling software system and shall make CEMS data available to the District's automated polling system on a daily basis. Upon notice by the District that the facility's CEMS is not providing polling data, the facility may continue to operate without providing automated data for a maximum of 30 days per calendar year provided the CEMS data is sent to the District by a District-approved alternative method. [District Rule 1080]

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

AQ-57 The owner or operator shall maintain the following records: the date, time and duration of any malfunction of the continuous monitoring equipment; dates of performance testing; dates of evaluations, calibrations, checks, and adjustments of the continuous monitoring equipment; date and time period

which a continuous monitoring system or monitoring device was inoperative. [District Rules 1080 and 2201 and 40 CFR 60.7(b)]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-58 The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

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

AQ-59 Monitor Downtime is defined as any unit operating hour in which the data for NOx, or O2 concentrations is either missing or invalid. [40 CFR 60.4380(b)(2)]

Verification: No verification necessary.

AQ-60 The owner or operator shall maintain records of the following items: 1) hourly and daily emissions, in pounds, for each pollutant listed in this permit on the days startup and or shutdown of the gas turbine system occurs, 2) hourly and daily emissions, in pounds, for each pollutant in this permit on the days startup and or shutdown of the gas turbine system does not occur, 3) quarterly emissions, in pounds, for each pollutant listed in this permit. [District Rule 2201]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-61 The owner or operator shall maintain a stationary gas turbine system operating log that includes, on a daily basis, the actual local startup and stop time, total hours of operation, the type and quantity of fuel used, date/time and duration of each start-up and each shutdown event. [District Rule 2201 and 4703, 6.2.6, 6.2.8, 6.2.11]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-62 The owner or operator shall maintain all records of required monitoring data and support information for a period of five years from the date of data entry and shall make such records available to the District upon request. [District Rules 2201 and 4703, 6.2.4]

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

AQ-63 The owner or operator shall submit a written report of CEM operations for each calendar quarter to the District. The report is due on the 30th day following the end of the calendar quarter and shall include the following: Date, time intervals, data and magnitude of excess NOx emissions, nature and the cause of excess (if known), corrective actions taken and preventive measures adopted; Averaging period used for data reporting corresponding to the averaging period specified in the emission test period used to determine compliance with an emission standard; Applicable time and date of each period during which the CEM was inoperative, except for zero and span checks, and the nature of system repairs and adjustments; A negative declaration when no excess emissions occurred. [District Rule 1080 and 40 CFR 60.4375(a) and 60.4395]

Verification: The project owner shall submit to the District and CPM the report of CEM operations, emission data, and monitor downtime data in the quarterly operation report (**AQ-SC8**) that follows the definitions of this condition.

AQ-64 The owner or operator shall submit to the District information correlating the NOx control system operating parameters to the associated measured NOx output. The information must be sufficient to allow the District to determine compliance with the NOx emission limits of this permit when the CEMS is not operating properly. [District Rule 4703, 6.2.5]

Verification: The project owner shall submit to the District and CPM the report of CEM operations, emission data, and monitor downtime data in the quarterly operation report (**AQ-SC8**).

AQ-65 Prior to operating under ATCs N-3299-4-0, N-3299-5-0 and N-3299-6-0, the permittee shall mitigate the following quantities of NOx: 1st quarter: 34,905 lb, 2nd quarter: 35,292 lb, 3rd quarter: 35,682 lb, and 4th quarter: 35,682 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM records showing that the project's offset requirements have been met prior to initiating operation.

AQ-66 NOx ERC S-3113-2 (or a certificate split from this certificate) shall be used to supply the required NOx offsets, unless a revised offsetting proposal is received and approved by the District. Following the revisions, this Authority to Construct permit shall be re-issued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to re-issuance of this Authority to Construct permit. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM records showing that the project's offset requirements have been met prior to initiating operation.

AQ-67 Prior to operating under ATCs N-3299-4-0, N-3299-5-0 and N-3299-6-0, the permittee shall mitigate the following quantities of VOC: 1st quarter: 6,113 lb, 2nd quarter: 6,113 lb, 3rd quarter: 6,114 lb, and 4th quarter: 6,114 lb. Offsets

shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM records showing that the project's offset requirements have been met prior to initiating operation.

AQ-68 VOC ERC C-1008-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets, unless a revised offsetting proposal is received and approved by the District. Following the revisions, this Authority to Construct permit shall be re-issued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to re-issuance of this Authority to Construct permit. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM records showing that the project's offset requirements have been met prior to initiating operation.

AQ-69 Prior to operating under ATCs N-3299-4-0, N-3299-5-0 and N-3299-6-0, the permittee shall mitigate the following quantities of PM10: 1st quarter: 13,506 lb, 2nd quarter: 13,507 lb, 3rd quarter: 13,507 lb, and 4th quarter: 13,507 lb. Offsets shall be provided at the applicable offset ratio specified in Table 4-2 of Rule 2201 (as amended 9/21/06). [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM records showing that the project's offset requirements have been met prior to initiating operation.

AQ-70 SOx ERC S-3129-5 (or a certificate split from this certificate) shall be used to supply the required PM10 offsets, unless a revised offsetting proposal is received and approved by the District. Following the revisions, this Authority to Construct permit shall be re-issued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to re-issuance of this Authority to Construct permit. [District Rule 2201]

Verification: The project owner shall submit to both the District and CPM records showing that the project's offset requirements have been met prior to initiating operation.

AQ-71 The District has authorized to use SOx reductions to offset emissions increase in PM10 at SOx/PM10 interpollutant offset ratio of 1.00. [District Rule 2201]

Verification: No verification necessary.

AQ-72 Disturbances of soil related to any construction, demolition, excavation, extraction, or other earthmoving activities shall comply with the requirements for fugitive dust control in District Rule 8021 unless specifically exempted under Section 4.0 of Rule 8021 or Rule 8011. [District Rules 8011 and 8021]

Verification: A summary of significant construction activities and monitoring records required shall be included in the construction monthly compliance report (**AQ-SC3**).

AQ-73 An owner/operator shall submit a Dust Control Plan to the APCO prior to the start of any construction activity on any site that will include 10 acres or more of disturbed surface area for residential developments, or 5 acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. [District Rules 8011 and 8021]

Verification: The Dust Control Plan shall be included within the Air Quality Construction Mitigation Plan and submitted to the District and CPM (**AQ-SC2**), and a summary of significant construction activities and monitoring records required shall be included in the construction monthly compliance report (**AQ-SC3**).

AQ-74 An owner/operator shall prevent or clean up any carryout or trackout in accordance with the requirements of District Rule 8041 Section 5.0, unless specifically exempted under Section 4.0 of Rule 8041 or Rule 8011. [District Rules 8011 and 8041]

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

AQ-75 Whenever open areas are disturbed, or vehicles are used in open areas, the facility shall comply with the requirements of Section 5.0 of District Rule 8051, unless specifically exempted under Section 4.0 of Rule 8051 or Rule 8011. [District Rules 8011 and 8051]

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

AQ-76 Any paved road or unpaved road shall comply with the requirements of District Rule 8061 unless specifically exempted under Section 4.0 of Rule 8061 or Rule 8011. [District Rules 8011 and 8061]

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

AQ-77 Water, gravel, roadmix, or chemical/organic dust stabilizers/suppressants, vegetative materials, or other District-approved control measure shall be applied to unpaved vehicle travel areas as required to limit Visible Dust Emissions to 20% opacity and comply with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011. [District Rule 8011 and 8071]

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

AQ-78 Where dusting materials are allowed to accumulate on paved surfaces, the accumulation shall be removed daily or water and/or chemical/organic dust stabilizers/suppressants shall be applied to the paved surface as required to maintain continuous compliance with the requirements for a stabilized

unpaved road as defined in Section 3.59 of District Rule 8011 and limit Visible Dust Emissions (VDE) to 20% opacity. [District Rule 8011 and 8071]

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

AQ-79 On each day that 50 or more Vehicle Daily Trips or 25 or more Vehicle Daily Trips with 3 axles or more will occur on an unpaved vehicle/equipment traffic area, permittee shall apply water, gravel, roadmix, or chemical/organic dust stabilizers/suppressants, vegetative materials, or other District-approved control measure as required to limit Visible Dust Emissions to 20% opacity and comply with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011. [District Rule 8011 and 8071]

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

AQ-80 Whenever any portion of the site becomes inactive, Permittee shall restrict access and periodically stabilize any disturbed surface to comply with the conditions for a stabilized surface as defined in Section 3.58 of District Rule 8011. [District Rules 8011 and 8071]

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

AQ-81 Records and other supporting documentation shall be maintained as required to demonstrate compliance with the requirements of the rules under Regulation VIII only for those days that a control measure was implemented. Such records shall include the type of control measure(s) used, the location and extent of coverage, and the date, amount, and frequency of application of dust suppressant, manufacturer's dust suppressant product information sheet that identifies the name of the dust suppressant and application instructions. Records shall be kept for one year following project completion that results in the termination of all dust generating activities. [District Rules 8011, 8031 and 8071]

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-82 The owners and operators of each affected source and each affected unit at the source shall have an Acid Rain permit and operate in compliance with all permit requirements. [40 CFR 72]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

AQ-83 The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75. [40 CFR 75]

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

AQ-84 The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program. [40 CFR 75]

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

AQ-85 The owners and operators of each source and each affected unit at the source shall: (i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)) not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and (ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide. [40 CFR 73]

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

AQ-86 Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act. [40 CFR 77]

Verification: No verification necessary.

AQ-87 Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program. [40 CFR 72]

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

AQ-88 An allowance shall not be deducted in order to comply with the requirements under 40 CFR part 73, prior to the calendar year for which the allowance was allocated. [40 CFR 73]

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

AQ-89 An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or the written exemption under 40 CFR 72.7 and 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization. [40 CFR 72]

Verification: No verification necessary.

AQ-90 An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right. [40 CFR 72]

Verification: No verification necessary.

AQ-91 The designated representative of an affected unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77. [40 CFR 77]

Verification: The project owner shall submit to both the District and CPM the proposed offset plan as required by the federal rule.

AQ-92 The owners and operators of an affected unit that has excess emissions in any calendar year shall: (i) Pay without demand the penalty required, and pay up on demand the interest on that penalty; and (ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77. [40 CFR 77]

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

AQ-93 The owners and operators of the each affected unit at the source shall keep on site the following documents for a period of five years from the date the document is created. This period may be extended for cause, at any time prior to the end of five years, in writing by the Administrator or permitting authority: (i) The certificate of representation for the designated representative for the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site beyond such five-year period until such documents are superceded because of the submission of a new certificate of representation changing the designated representative. [40 CFR 72]

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

AQ-94 The owners and operators of each affected unit at the source shall keep on site each of the following documents for a period of five years from the date the document is created. This period may be extended for cause, at any time prior to the end of five years, in writing by the Administrator or permitting authority; (ii) All emissions monitoring information, in accordance with 40 CFR part 75; (iii) Copies of all reports, compliance certifications and other submissions and all records made or required under the Acid Rain Program; (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission that demonstrates compliance with the requirements of the Acid Rain Program. [40 CFR 75]

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

AQ-95 The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR 75 Subpart I. [40 CFR 75]

Verification: The project owner shall submit to both the District and CPM the Acid Rain Program application after completing commissioning.

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AIR QUALITY APPENDIX AIR-1

Greenhouse Gas Emissions

Testimony of Tao Jiang and Brewster Birdsall, P.E., QEP

SUMMARY OF CONCLUSIONS

The Almond 2 Power Plant (A2PP) project is a proposed addition to the state's electricity system. It would be an efficient, new, dispatchable natural gas-fired simple-cycle power plant that would produce greenhouse gas (GHG) emissions while generating electricity for California consumers. Its addition to the system would displace other less efficient plants and facilitate the integration of renewable resources. Because the project will improve the efficiency of existing system resources, the addition of A2PP would contribute to a reduction of the California and overall Turlock Irrigation District (TID) system GHG[1] emissions and GHG emission rate average.

Staff notes that mandatory reporting of the GHG emissions provides the necessary information for the California Air Resources Board (ARB) to develop greenhouse gas regulations and/or trading markets required by the California Global Warming Solutions Act of 2006 (AB 32 Núñez, Statutes of 2006, Chapter 488, Health and Safety Code sections 38500 et seq.). The project may be subject to additional reporting requirements and GHG reductions or trading requirements as these regulations are more fully developed and implemented.

The Energy Commission adopted an order initiating an informational (OII) proceeding (08-GHG OII-1) to explore methods of assessing the greenhouse gas impacts of proposed new power plants in accordance with the California Environmental Quality Act (CEQA). This analysis provides the staff's conclusions regarding greenhouse gas emissions for this siting case. Future power plant siting cases are likely to be reviewed with the benefit of new information and policy direction from the Energy Commission and other agencies including ARB. This analysis recognizes that "prudent use" of natural gas for electricity generation will serve to optimize the system (for integrating intermittent renewable generation and providing reliability), but, without further analysis and policy direction by the Commission to refine this general understanding, this analysis leaves the implications for optimizing the system to future cases (CEC 2009a).

The operation of A2PP would affect the overall electricity system operation and GHG emissions in several ways:

- A2PP would provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation.
- A2PP would displace some less efficient local generation in the dispatch order of gas-fired facilities that are required to provide electricity reliability in the TID system.

[1] Fuel-use closely correlates to carbon dioxide (CO_2) emissions from natural gas-fired power plants. And since CO_2 emissions from the fuel combustion dominate greenhouse gas (GHG) emissions from power plants, the terms CO_2 and GHG are used interchangeably in this section.

- A2PP would facilitate to some degree the replacement of out-of-state coal electricity generation that must be phased out in conformance with the State's new Emissions Performance Standard.
- A2PP could facilitate to some extent the replacement of generation provided by aging power plants that use once-through cooling.

The proposed A2PP would be designed to provide flexible, dispatchable power with simple-cycle units that are quick-starting and fast-ramping. The project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff believes that the project would result in a net reduction in GHG emissions from power plants, would not worsen, but would improve, current conditions, and would, thus, not result in impacts that are cumulatively significant.

Staff concludes that the short-term emission of greenhouse gases during construction would be sufficiently reduced by "best practices" and would not be significant.

The project would not be subject to the limits of the greenhouse gas Emission Performance Standard (EPS) (Title 20, California Code of Regulations, Section 2900 et seq.) because A2PP is a simple-cycle power plant, designed and intended to provide electricity at an annualized plant capacity factor of less than 60% (CH2M2009h).

INTRODUCTION

Greenhouse gas (GHG) emissions are not criteria pollutants, but they are discussed in the context of cumulative impacts. In December 2009, the U.S. Environmental Protection Agency (EPA) declared that greenhouse gases (GHGs) threaten the public health and welfare of the American people (the endangerment finding), and this became effective on January 14, 2010. Regulating GHG at the federal level may be furthered by the Prevention of Significant Deterioration (PSD) program and New Source Review (NSR) rule changes proposed by U.S. EPA on September 30, 2009. These requirements could eventually apply to new facilities whose carbon dioxide-equivalent emissions exceed 25,000 tons per year (U.S.EPA2009c). Federal rules that became effective December 29, 2009 (40 CFR 98) already require reporting of GHG. As federal rulemaking evolves, staff focuses on analyzing the ability of the project to comply with existing state-level policies and programs for GHG. The state has demonstrated its intent to address global climate change though research, adaptation,[2] and GHG inventory reductions. In that context, staff evaluates the GHG emissions from the proposed project, presents information on GHG emissions related to electricity generation, and describes the applicable GHG standards and requirements.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies in **Greenhouse Gas Table 1** pertain to the control and mitigation of greenhouse gas emissions. Staff's analysis examines the project's compliance with these requirements.

[2] While working to understand and reverse global climate change, it is prudent to also adapt to potential changes in the state's climate (for example, changing rainfall patterns).

Greenhouse Gas Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Mandatory Reporting of Greenhouse Gases (40 CFR 98, Subpart D)	This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2 equivalent emissions per year.
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	California Global Warming Solutions Act of 2006. This act requires the California Air Resources Board (ARB) to enact standards that will reduce GHG emissions to 1990 levels. Electricity production facilities will be regulated by the ARB.
California Code of Regulations, tit. 17, Subchapter 10, Article 2, sections 95100 et. seq.	ARB regulations implementing mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)
California Code of Regulations, tit. 20, section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 $MTCO_2$/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lb CO_2/MWh).

GLOBAL CLIMATE CHANGE AND CALIFORNIA

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of greenhouse gases, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Indeed, the California Legislature finds that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Health & Safety Code, sec. 38500).

In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p.5). In 2003, the Energy Commission recommended that the state require reporting of greenhouse gases or global climate change[3] emissions as a condition of state licensing of new electric generating facilities (CEC 2003, IEPR p. 42). Three years later, California enacted the California Global Warming Solutions Act of 2006 (AB 32). It requires the California Air Resources Board (ARB) to adopt standards that will reduce statewide GHG emissions to statewide GHG emissions levels in 1990, with such reductions to be achieved by 2020.[4] To achieve this, ARB has a mandate to define the 1990 emissions levels and achieve the maximum technologically feasible and cost-effective GHG emission reductions.

The ARB adopted early action GHG reduction measures in October 2007, adopted mandatory reporting requirements and the 2020 statewide target in December 2007,

[3] Global climate change is the result of greenhouse gases, or emissions with global warming potentials, affecting the energy balance and, thereby, climate of the planet. The terms greenhouse gases (GHG) and global climate change (GCC) gases are used interchangeably.
[4] Governor Schwarzenegger has also issued Executive Order S-3-05 establishing a goal of 80% below 1990 levels by 2050.

and adopted a statewide scoping plan in December 2008 to identify how emission reductions will be achieved from significant sources of GHG via regulations, market mechanisms, and other actions. ARB staff is developing regulatory language to implement its plan and holds ongoing public workshops on key elements of the recommended GHG reduction measures, including market mechanisms (ARB 2006). The regulations must be effective by January 1, 2011, and mandatory compliance commences on January 1, 2012. The mandatory reporting requirements are effective for electric generating facilities over 1 megawatt (MW) capacity, and the due date for initial reports by existing facilities this first year was June 1, 2009.

Examples of strategies that the state might pursue for managing GHG emissions in California, in addition to those recommended by the Energy Commission and the Public Utilities Commission, were identified in the California Climate Action Team's Report to the Governor (CalEPA 2006). The scoping plan approved by the ARB in December 2008 builds upon the overall climate policies of the Climate Action Team report and shows the recommended strategies to achieve the goals for 2020 and beyond. Some strategies focus on reducing consumption of petroleum across all areas of the California economy. Improvements in transportation energy efficiency (fuel economy) and land use planning and alternatives to petroleum-based fuels are slated to provide substantial reductions by 2020 (CalEPA 2006). The scoping plan includes a 33% Renewables Portfolio Standard (RPS), aggressive energy efficiency targets, and a cap-and-trade system that includes the electricity sector (ARB 2008c).

It is possible that GHG reductions mandated by ARB will be non-uniform or disproportional across emitting sectors, in that most reductions will be based on cost-effectiveness (i.e., the greatest effect for the least cost). For example, the ARB proposes a 40% reduction in GHG from the electricity sector, even though the sector currently only produces about 25% of the state's GHG emissions. In response, in September 2008 the Energy Commission and the California Public Utilities Commission provided recommendations (CPUC 2008) to ARB on how to achieve such reductions through both programmatic and regulatory approaches and identified points of regulation within the sector should ARB decide that a multi-sector cap and trade system is warranted.

The Energy Commission's *2007 Integrated Energy Policy Report* (IEPR) also addresses climate change within the electricity, natural gas, and transportation sectors (CEC 2007a). For the electricity sector, it recommends such approaches as pursuing all cost-effective energy efficiency measures and meeting the Governor's stated goal of a 33% Renewables Portfolio Standard.

SB 1368,[5] also enacted in 2006, and regulations adopted by the Energy Commission and the Public Utilities Commission pursuant to the bill, prohibit California utilities from entering into long-term commitments with any base load facilities that exceed the Greenhouse Gas Emission Performance Standard of 0.500 metric tonnes CO_2 per megawatt-hour[6] (1,100 pounds CO_2/MWh). Specifically, the SB 1368 Emission Performance Standard (EPS) applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five

[5] California Code of Regulations, Title 20 § 2900 and Public Utilities Code § 8340 et seq.
[6] The Emission Performance Standard only applies to carbon dioxide and does not include emissions of other greenhouse gases converted to carbon dioxide equivalent.

years or more, including contracts with power plants located outside of California. If a project, instate or out of state, plans to sell base load electricity to California utilities, the utilities will have to demonstrate that the project complies with the EPS. *Base load* units are defined as those designed and intended to provide electricity at an annualized plant capacity factor of at least 60%. Compliance with the EPS is determined by dividing the annual average carbon dioxide emissions by the annual average net electricity production in MWh. This determination is based on capacity factors, heat rates, and corresponding emissions rates that reflect the *expected* operations of the power plant and not on full load heat rates [20 CCR §2903(a)].

In addition to these programs, California is involved in the Western Climate Initiative, a multi-state and international effort to establish a cap and trade market to reduce greenhouse gas emissions in the western United States and the Western Electricity Coordinating Council (WECC). The timelines for the implementation of this program are similar to those of AB 32, with full roll-out beginning in 2012. As with AB 32, the electricity sector has been a major focus of attention.

ELECTRICITY PROJECT GREENHOUSE GAS EMISSIONS

Electricity use can be as simple as turning on a switch to operate a light or fan. The system to deliver the adequate and reliable electricity supply is complex and variable. But it operates as an integrated whole to meet demand, such that the dispatch of a new source of generation unavoidably curtails or displaces one or more less efficient or less competitive existing sources. Within the system, generation resources provide electricity, or energy, generating capacity, and ancillary services to stabilize the system and facilitate electricity delivery, or movement, over the grid. *Capacity* is the instantaneous output of a resource, in megawatts. *Energy* is the capacity output over a unit of time, for example an hour or year, generally reported as megawatt-hours or gigawatt-hours (GWh). Ancillary services[7] include regulation, spinning reserve, non-spinning reserve, voltage support, and black start capability. Individual generation resources can be built and operated to provide only one specific service. Alternatively, a resource may be able to provide one or all of these services, depending on its design and constantly changing system needs and operations.

California is actively pursuing policies to reduce GHG emissions that include adding non-GHG emitting renewable generation resources to the system mix. In this context, and because fossil-fueled resources produce GHG emissions, it is important to consider the role and necessity of also adding fossil-fuel resources. A report prepared as a response to the GHG OII (CEC 2009a) defines five roles that gas-fired power plants are likely to fulfill in a high-renewables, low-GHG system (CEC 2009b, pp 93 and 94):

1. Intermittent generation support
2. Local capacity requirements
3. Grid operations support
4. Extreme load and system emergency
5. General energy support.

[7] See page CEC 2009b, page 95.

The Energy Commission staff-sponsored report reasonably assumes that non-renewable power plants added to the system would almost exclusively be natural gas-fueled. Nuclear, geothermal, and biomass plants are generally base load and not dispatchable. Solid fueled projects are also generally base load, not dispatchable and carbon sequestration technologies needed to reduce the GHG emission rates to meet the EPS are not yet developed (CEC 2009b, p. 92). Further, California has almost no sites available to add highly dispatchable hydroelectric generation.

Generation of electricity using any fossil fuel, including natural gas, can produce greenhouse gases with the criteria air pollutants that have been traditionally regulated under the federal and state Clean Air Acts. For fossil fuel-fired power plants, the GHG emissions include primarily carbon dioxide, with much smaller amounts of nitrous oxide (N_2O, not NO or NO_2, which are commonly known as NOx or oxides of nitrogen), and methane (CH_4 – often from unburned natural gas). Also included are sulfur hexafluoride (SF_6) from high voltage equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. GHG emissions from the electricity sector are dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG emissions are small and also are more likely to be easily controlled or reused or recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials. Global warming potential is a relative measure, compared to carbon dioxide, of a compound's residence time in the atmosphere and ability to warm the planet. Mass emissions of GHGs are converted into carbon dioxide equivalent (CO2E) metric tonnes (MT) for ease of comparison.

CONSTRUCTION

Construction of industrial facilities such as power plants requires coordination of a variety of equipment and personnel. The concentrated on-site activities result in short-term, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. Construction of A2PP would involve 12 months of activity. The applicant provided a GHG emission estimate for the entirety of the construction phase (CH2M2009f). The GHG emissions estimate, presented below in **Greenhouse Gas Table 2**, includes the total emissions for the 12 months of construction activity in terms of CO_2-equivalent.

Greenhouse Gas Table 2
A2PP, Estimated Potential Construction Greenhouse Gas Emissions

Construction Source	Construction-Phase GHG Emissions (MTCO2E) [a]
Onsite construction	1,070
Deliveries to construction site	342
Worker travel to/from construction site	1,282
Construction of linear facilities	18
Deliveries to linear facilities construction areas	8
Worker travel to/from linear facilities construction areas	160
Construction Total	2,880

Source: AFC Table 5.1E-5 and Response to Data Request 7, Attachment DR7-1 (CH2M2009f, CH2M2009k).
Notes: a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms

OPERATIONS

The proposed A2PP a nominal 174-megawatt (MW) facility consisting of three General Electric (GE) Energy LM6000PG SPRINT natural gas-fired turbine generators and associated equipment. While TID does not intend to run A2PP as a base load facility, TID proposes to permit A2PP to have an annual plant availability of 92 to 98%. It would be possible for plant availability to exceed 98% for a given 12-month period. However, the exact operational profile of this peaking plant will depend on the variable demand within TID's own Balancing Authority.

The primary sources of GHG would be the natural gas fired combustion turbines. There would also be a small amount of GHG emissions from sulfur hexafluoride (SF_6) leaking from new electrical component equipment. The employee and delivery traffic GHG emissions from off-site activities are negligible in comparison with the gas turbine GHG emissions.

Greenhouse Gas Table 3 shows what the proposed project, as permitted, could potentially emit in greenhouse gases on an annual basis. All emissions are converted to CO_2-equivalent and totaled. Electricity generation GHG emissions are generally dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG are typically small and also are more likely to be easily controlled or reused/recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials. A small amount of additional SF_6 containing equipment will be required for this project, and the leakage of SF_6 and its CO_2 equivalent emissions have been estimated.

Greenhouse Gas Table 3
A2PP, Estimated Potential Greenhouse Gas (GHG) Emissions

Emissions Source	**Operational GHG Emissions (MTCO2E/yr)** [a]
Combustion Turbine Generators (Three CTGs)	727,633
Switchyard Breakers	38
Total Project GHG Emissions, excluding Off-Site Emissions (MTCO2E/yr)	**727,671**
Estimated Annual Energy Output (MWh/yr) [b]	1,425,217
Estimated Annualized GHG Performance (MTCO2/MWh)	**0.510**

Sources: AFC Appendix Table 5.1A-6 (TID2009a).
Notes: a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
b. Based on maximum permitted capacity of 8,760 hours of annual operation. (TID2009a, AFC Table 5.1A-6).

The proposed project would be permitted, on an annual basis, to emit over 727,671 metric tonnes of CO_2-equivalent per year if operated at its maximum permitted level. The proposed A2PP, at 0.51 MTCO2/MWh, would slightly exceed the limits of SB 1368 and the Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh for base load generation. However, A2PP is not designed or intended for base load generation, even though TID has requested permission to run the facility at greater than a 60% capacity factor. This simple-cycle facility is not expected to operate at greater than 33% capacity factor, and Energy Commission staff experience indicates that this type of facility is only likely to exceed 30% annual capacity

factor in an emergency or crisis situation. Therefore, although the facility would be allowed to operate at greater than 60% capacity factor if needed, staff agrees with the applicant that A2PP is not designed or intended to do so.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff assesses the cumulative effects of GHG emissions caused by both construction and operation. As the name implies, construction impacts result from the emissions occurring during the construction of the project. The operation impacts result from the emissions of the proposed project during operation. Staff is continuing to monitor development of AB 32 Scoping Plan implementation efforts and general trends and developments affecting GHG regulation in the electricity sector.

The impact of GHG emissions caused by this natural gas-fired facility is characterized by considering how the power plant would affect the overall electricity system. The integrated electricity system depends on generation resources to provide energy and satisfy local capacity needs. Energy Commission staff follows the concept of a "blueprint" to describe the long-term roles of fossil-fueled power plants in California's electricity system (CEC 2009a). The five separate roles that gas-fired power plants are most likely to fulfill in the future of a high-renewables, low-GHG system include: 1) Intermittent generation support; 2) Local capacity requirements; 3) Grid operations support; 4) Extreme load and system emergencies support; and 5) General energy support (CEC 2009b, p. 93). A2PP is analyzed here for its role in providing local capacity and generation and general energy support for expected generation retirements or replacements.

CONSTRUCTION IMPACTS

Staff does not believe that the minor GHG emission increases from construction activities would be significant for several reasons. First, the period of construction would be short-term and the emissions intermittent during that period, not ongoing during the life of the project. Additionally, control measures that staff recommends to address criteria pollutant emissions, such as limiting idling times and requiring, as appropriate, using equipment that meets the latest criteria pollutant emissions standards would further minimize greenhouse gas emissions to the extent feasible. The use of newer equipment will increase fuel efficiency and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment.

DIRECT/INDIRECT OPERATION IMPACTS AND MITIGATION

New, efficient, natural gas-fired generation promotes the state's efforts to improve GHG electrical generation efficiencies and, therefore, reduce the amount of natural gas used by electricity generation and greenhouse gas emissions. As the *2007 Integrated Energy Policy Report* (CEC 2007a, p. 184) noted:

> New natural gas-fueled electricity generation technologies offer efficiency, environmental, and other benefits to California, specifically by reducing the amount of natural gas used—and with less natural gas burned, fewer greenhouse gas emissions. Older combustion and steam turbines use outdated technology that makes them less fuel- and cost-efficient than newer, cleaner

> plants.The 2003 and 2005 IEPRs noted that the state could help reduce natural gas consumption for electric generation by taking steps to retire older, less efficient natural gas power plants and replace or repower them with new, more efficient power plants.

Thus, in the context of the Energy Commission's *Integrated Energy Policy Report*, the A2PP furthers the state's strategy to promote generation system efficiency and reduce fuel use and GHG emissions. As stated in the 2009 *Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California* (CEC 2009b, p.23):

> When one resource is added to the system, all else being held equal, another resource will generate less power. If the new resource has a lower cost or fewer emissions than the existing resource mix, the aggregate system characteristics will change to reflect the cheaper power and lower GHG emissions rate.

Net GHG emissions for the integrated electric system will decline when new gas-fired power plants are added to: 1) permit the penetration of renewable generation to the 33% target; 2) improve the overall efficiency of the electric system; or 3) serve load growth or capacity needs more efficiently than the existing fleet (CEC 2009b, p. 98).

The Role of A2PP in Local Generation Displacement

The proposed A2PP would have a net heat rate of approximately 9,835 Btu/kWh[8], which leads to an estimated GHG performance factor of approximately 0.51 MTCO2/MWh. The heat rate, energy output and GHG emissions of other local generation resources are listed in **Greenhouse Gas Table 4**. Compared to the other existing simple-cycle and peaker power plants in the TID Balancing Authority area, the proposed A2PP would be more efficient, and emit fewer GHG emissions during any hour of operation. Local generating units with the best (lowest) heat rate or lowest GHG performance factor generally operate more than other units with higher heat rates, as shown by the relative amount of energy (GWh) produced in 2008 from the local units. However, dispatch order can change, or deviate from economic or efficiency dispatch, in any one year or due to other concerns such as permit limits, contractual obligations, droughts, heat waves, local reliability needs or emergencies. These deviations, however, are likely to occur infrequently and are unplanned.

[8] Based on the High Heating Value (HHV) of the fuel(s) used. HHV is used for all heat rate and fuel conversions to GHG mass emissions that are discussed in this document.

Greenhouse Gas Table 4
San Joaquin and Stanislaus Counties, Local Generation Heat Rates and 2008 Energy Outputs

Plant Name	Heat Rate (Btu/kWh) [a]	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Lodi Energy Center (under agency review)	7,112	Potential approval in 2010	0.377
Walnut Energy Center	7,822	1,578	0.415
Woodland 1	8,761	416	0.465
Tracy Combined Cycle (under agency review)	8,056	Potential approval in 2010	0.474
Lodi STIG	9,000	72	0.477
Almond Power Plant	11,074	62	0.587
MID Ripon	11,908	33	0.631
McClure 1, 2	15,222	18	0.807
Tracy Peaker Plant	12,310	11	0.652
Walnut Power Plant (Peaker)	19,098	1	1.013
Proposed TID A2PP (at permitted limit)	9,835	1,425 (max est.)	0.510

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER); shows the proposed TID A2PP at the permitted capacity of 8,760 hours annually although it is only expected to operate up to 5,000 hours on annualized basis (CH2M2009h).
Notes: a. Based on the Higher Heating Value or HHV of the fuel.

The proposed A2PP would not be physically within a major local reliability area like the Greater Bay Area. However, it would provide local reliability and displace other power plants within the TID Balancing Authority area, which allows TID to better use the existing Walnut Energy Center and displacement of energy from the existing, less-efficient Almond and Walnut power plants (CH2M2009h).

The Role of A2PP in the Integration of Renewable Energy

As California moves towards an increased reliance on renewable energy, the bulk of renewable generation available to, and used in California, will be intermittent wind generation with some intermittent solar (CEC 2009b, p.3). To accommodate the increased variability in generation due to increasing renewable penetration, compounded by increasing load variability, control authorities such as the California Independent System Operator (CAISO) need increased flexibility from other generation resources such as hydro generation, dispatchable pump loads, energy storage systems, and fast ramping and fast starting fossil fuel generation resources (CAISO 2007, p. 14).

A2PP would provide flexible, dispatchable and fast ramping[9] power consistent with the CAISO use of this term, and it would not obstruct penetration of renewable energy. A2PP will serve as an important firming source for intermittent renewable resources in support of TID's RPS and GHG goals (CH2M2009f). TID claims that A2PP would allow more efficient use of TID's wind resource from the Pacific Northwest and other renewable resources. In 2004, TID Board adopted its own 20% RPS standard by 2017. The wind project has brought 28% RPS to TID's profile. Therefore, TID has met its own RPS goal to date.

[9] The CAISO categorizes *fast-ramping* as a generator capable of going from lowest power to highest in under 20 minutes, or greater than 10 MW per minute.

The proposed simple-cycle LM6000PG gas turbines for A2PP provide TID with quick starting and fast ramping power. TID investigated potentially using combined cycle turbines with quick-startup packages, but found them to be too large to meet TID's load increment criteria (CH2M2009f).

The amount of dispatchable fossil fuel generation will have to be significantly increased to meet the statewide 20% RPS (CAISO 2007, p.113); the 33% RPS will require even more dispatchable resources to integrate the renewables. However, this does not suggest the existing and new fossil fuel capacity will operate more. **Greenhouse Gas Table 5** shows how the build-out of either the 20% or the 33% statewide RPS goal will affect generation from new and existing non-renewable resources. Should California reach its goal of meeting 33%of its retail demand in 2020 with renewable energy, non-renewable, most likely fossil-fueled, energy needs will fall by over 36,000 GWh/year. In other words, all growth will need to come from renewable resources to achieve the 33% RPS. And some existing and new fossil units will generate less energy than they currently do, given the expected growth in retail sales.

These assumptions are conservative in that the forecasted growth in retail sales assumes that the impacts of planned increases in expenditures on (uncommitted) energy efficiency are already embodied in the retail sales forecast.[10] Energy Commission staff estimates that as much as 18,000 GWh of additional savings due to uncommitted energy efficiency programs may be forthcoming.[11] This would reduce non-renewable energy needs by a further 12,000 GWh given a 33% RPS.

Greenhouse Gas Table 5
Estimated Changes in Non-Renewable Energy Potentially Needed to Meet California Loads, 2008 to 2020

California Electricity Supply	**Annual GWh**	
Statewide Retail Sales, 2008, actual [a]	264,794	
Statewide Retail Sales, 2020, forecast [a]	289,697	
Growth in Retail Sales, 2008-20	24,903	
Growth in Net Energy for Load, 2008-20 [b]	29,840	
California Renewable Electricity	**GWh @ 20% RPS**	**GWh @ 33% RPS**
Renewable Energy Requirements, 2020 [c]	57,939	95,600
Current Renewable Energy, 2008	29,174	
Change in Renewable Energy, 2008-20 [c]	28,765	66,426
Resulting Change in Non-Renewable Energy	176	-36,586

Source: Energy Commission staff 2010.
Notes:
a. 2009 IEPR Demand Forecast, Form 1.1c. Excludes pumping loads for entities that do not have an RPS.
b. 2009 IEPR Demand Forecast, Form 1.5a.
c. RPS requirements are a percentage of retail sales.

[10] Energy efficiency savings are already represented in the current Energy Commission demand forecast adopted December 2009 (CEC2009c).
[11] See *Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 Integrated Energy Policy Report Adopted Demand Forecast* (CEC-200-2010-001-D, January, 2010), page 2. Table 1 indicates that additional conservation for the three investor-owned utilities may be as high as 14,374 GWh. Increasing this value by 25% to account for the state's publicly-owned utilities yields a total reduction of 17,967 GWh.

The Role of A2PP in Retirements/Replacements

A2PP would be permitted to run continuously and provide more than 1,400 GWh of natural gas-fired generation that could replace resources that are or will likely be precluded from serving California loads. State policies, including GHG goals, are discouraging or prohibiting new contracts and new investments in coal-fired generation, generation that relies on water for once-through cooling, and aging power plants (CEC 2007a). Some of the existing plants that are likely to require significant capital investments to continue operation in light of these policies may be unlikely to undertake the investments and will retire or be replaced.

Replacement of Coal-Fired Generation

Coal-fired resources are effectively prohibited from entering into new long-term, base load contracts for California deliveries as a result of the Emissions Performance Standard adopted in 2007 pursuant to SB 1368. Between now and 2020, more than 18,000 GWh of energy procured by California utilities under existing contracts will have to be replaced; these contracts are listed in **Greenhouse Gas Table 6**.

This represents almost half of the energy associated with California utility contracts with coal-fired resources that will expire by 2030. If the State enacts a carbon adder[12], all the coal contracts (including those in **Greenhouse Gas Table 6**, which expire by 2020, and other contracts that expire beyond 2020 and are not shown in the table) may be retired at an accelerated rate as coal-fired energy becomes uncompetitive. Also shown are the approximate 500 MW of in-state coal and petroleum coke-fired capacity that may not be able to contract with California utilities due to the SB 1368 Emission Performance Standard. As these contracts expire, new and existing generation resources will replace the lost energy and capacity. Some will come from renewable generation; some will come from new and existing natural gas fired generation. New generation resources generally will emit significantly less GHG than the coal and petroleum coke-fired generation, which average about 1.0 MTCO2/MWh, or two times more than the proposed A2PP, resulting in a significant net reduction in GHG emissions from the California electricity sector.

[12] A carbon adder or carbon tax is a specific value added to the cost of a project per ton of associated carbon or carbon dioxide emissions. Because it is based on, but not limited to, actual operations and emission and can be trued up at year end, it is considered a simple mechanism to assign environmental costs to a project.

Greenhouse Gas Table 6
Expiring Long-term Contracts with Coal-fired Generation 2009 – 2020

Utility	Facility [a]	Contract Expiration	Annual GWh Delivered to CA
PG&E, SCE	Misc In-state Qual. Facilities [a]	2009-2019	4,086
LADWP	Intermountain	2009-2013	3,163 [b]
City of Riverside	Bonanza, Hunter	2010	385
Department of Water Resources	Reid Gardner	2013 [c]	1,211
SDG&E	Boardman	2013	555
SCE	Four Corners	2016	4,920
Turlock Irrigation District	Boardman	2018	370
LADWP	Navajo	2019	3,832
		TOTAL	**18,522**

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings.
Notes: a. All facilities are located out-of-state except for the Miscellaneous In-state Qualifying Facilities.
b. Estimated annual reduction in energy provided to LADWP by Utah utilities from their entitlement by 2013.
c. Contract not subject to Emissions Performance Standard, but the Department of Water Resources has stated its intention not to renew or extend.

Retirement of Generation Using Once-Through Cooling

New, dispatchable resources like A2PP would also be required to provide generation capacity (that is, the ability to meet fluctuating, intermittent electricity loads) in the likely event that facilities utilizing once-through cooling (OTC) are retired. The State Water Resource Control Board (SWRCB) has proposed significant changes to OTC units, which would likely require retrofit, retirement, or significant curtailment of dozens of generating units. In 2008, these units collectively produced about 58,000 GWh. While those OTC facilities owned and operated by utilities and recently-built combined cycle plants may well install dry or wet cooling towers, it is unlikely that the aging, merchant plants will do so. Most of these units operate at low capacity factors, suggesting a limited ability to compete in the current electricity market. Although the timing would be uncertain, new resources would out-compete aging plants and would likely displace the energy provided by OTC facilities and accelerate the retirements.

Any additional costs associated with complying with the SWRCB regulation would be amortized over a limited revenue stream today and into the foreseeable future. Their energy and much of their dispatchable, load-following capability will have to be replaced. These units constitute over 15,000 MW of merchant capacity and 17,800 GWh of merchant energy. Of this, much but not all of the capacity and energy are in local reliability areas, requiring a large share of replacement capacity – absent transmission upgrades – to locations in the same local reliability area. **Greenhouse Gas Table 7** provides a summary of the utility and merchant energy supplies affected by the OTC regulations.

Greenhouse Gas Table 7
Units Utilizing Once-Through Cooling: Capacity and 2008 Energy Output [a]

Plant, Unit Name	Owner	Local Reliability Area	Aging Plant?	Capacity (MW)	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Diablo Canyon 1, 2	Utility	None	No	2,232	17,091	Nuclear
San Onofre 2, 3	Utility	L.A. Basin	No	2,246	15,392	Nuclear
Broadway 3 [b]	Utility	L.A. Basin	Yes	75	90	0.648
El Centro 3, 4 [b]	Utility	None	Yes	132	238	0.814
Grayson 3-5 [b]	Utility	LADWP	Yes	108	150	0.799
Grayson CC [b]	Utility	LADWP	Yes	130	27	0.896
Harbor CC	Utility	LADWP	No	227	203	0.509
Haynes 1, 2, 5, 6	Utility	LADWP	Yes	1,046	1,529	0.578
Haynes CC [c]	Utility	LADWP	No	560	3,423	0.376
Humboldt Bay 1, 2 [a]	Utility	Humboldt	Yes	107	507	0.683
Olive 1, 2 [b]	Utility	LADWP	Yes	110	11	1.008
Scattergood 1-3	Utility	LADWP	Yes	803	1,327	0.618
Utility-Owned				**7,776**	**39,988**	**0.693**
Alamitos 1 - 6	Merchant	L.A. Basin	Yes	1,970	2,533	0.661
Contra Costa 6, 7	Merchant	S.F. Bay Area	Yes	680	160	0.615
Coolwater 1-4 [b]	Merchant	None	Yes	727	576	0.633
El Segundo 3, 4	Merchant	L.A. Basin	Yes	670	508	0.576
Encina 1-5	Merchant	San Diego	Yes	951	997	0.674
Etiwanda 3, 4 [b]	Merchant	L.A. Basin	Yes	666	848	0.631
Huntington Beach 1, 2	Merchant	L.A. Basin	Yes	430	916	0.591
Huntington Beach 3, 4	Merchant	L.A. Basin	No	450	620	0.563
Mandalay 1, 2	Merchant	Ventura	Yes	436	597	0.528
Morro Bay 3, 4	Merchant	None	Yes	600	83	0.524
Moss Landing 6, 7	Merchant	None	Yes	1,404	1,375	0.661
Moss Landing 1, 2	Merchant	None	No	1,080	5,791	0.378
Ormond Beach 1, 2	Merchant	Ventura	Yes	1,612	783	0.573
Pittsburg 5-7	Merchant	S.F. Bay Area	Yes	1,332	180	0.673
Potrero 3	Merchant	S.F. Bay Area	Yes	207	530	0.587
Redondo Beach 5-8	Merchant	L.A. Basin	Yes	1,343	317	0.810
South Bay 1-4	Merchant	San Diego	Yes	696	1,015	0.611
Merchant-Owned				**15,254**	**17,828**	**0.605**
Total In-State OTC				**23,030**	**57,817**	

Source; Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings
Notes:

a. OTC Humboldt Bay Units 1 and 2 are included in this list. They must retire in 2010 when the new Humboldt Bay Generating Station (not ocean-cooled), currently under construction, enters commercial operation.
b. Units are aging but are not OTC.
c. The Los Angeles Department of Water and Power (LADWP) reported a 2007 aggregate energy number of 4,003 GWh for all the Haynes units. Staff allocated the energy between the units based on Haynes' current and historical output allocations in the LADWP fillings for 2009 IEPR.

New generation resources that can either provide local support or energy will emit significantly less GHGs than the OTC fleet. Existing aging and OTC natural gas generation average 0.6 to 0.7 MTCO2/MWh, or more than 20% higher emissions than

the proposed A2PP. When project provides energy and capacity, depending on its location, it can provide a significant net reduction in GHG emissions from the electricity sector. A project located in a load pocket, for example, the Greater Bay Area Local Capacity Area, would more likely provide local reliability support as well as facilitate the retirement of aging and/or OTC power plants to a degree that the A2PP project could not.

CUMULATIVE IMPACTS

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

This entire assessment is a cumulative impact assessment. The project would emit greenhouse gases and, therefore, has been analyzed as a potential cumulative impact in the context of its effect on the electricity system, resulting GHG emissions from the system, and existing GHG regulatory requirements and GHG energy policies.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Ultimately, ARB’s AB 32 regulations are likely to address both the degree of electricity generation sector emissions reductions (through cap-and-trade), and the method by which those reductions will be achieved (e.g., through command-and-control). However, the exact approach to be taken is currently under development. That regulatory approach may address emissions not only from the newer, more efficient, and lower emitting facilities licensed by the Energy Commission, but also from the older, higher-emitting facilities not subject to any GHG reduction standard that this agency could presently impose. This programmatic approach is likely to be more effective in reducing GHG emissions overall from the electricity sector than one that merely relies on displacing out-of-state coal plants (“leakage”) or older “dirtier” facilities.

The Energy Commission and the Public Utilities Commission provided recommendations (CPUC 2008) to ARB on how to achieve such reductions through both programmatic and regulatory approaches and identified the regulation points should ARB decide that a multi-sector cap-and-trade system is warranted. As ARB codifies accurate GHG inventories and methods, it may become apparent that emission reductions from the generation sector are less cost-effective than other sectors, and that other sectors of sources can achieve reductions with relative ease and cost-effectiveness.

The project would be subject to ARB’s mandatory reporting requirements and potentially other future requirements mandating compliance with AB 32 that are being developed by ARB. How the project would comply with these ARB requirements is speculative at this time, but compliance would be mandatory. The ARB’s mandatory GHG emissions

reporting requirements do not indicate whether the project, as defined, would comply with the potential GHG emissions reduction regulations being formulated under AB 32. The project may have to provide additional reports and GHG reductions, depending on the future regulations expected from ARB. Similarly, this project would be subject to federal mandatory reporting of GHG.

Reporting of GHG emissions would enable the project to demonstrate consistency with the policies described above and the regulations that ARB adopts and to provide the information to demonstrate compliance with any applicable EPS that could be enacted in the next few years. The A2PP would exceed the Emission Performance Standard in SB 1368 for base load generation, but as a simple-cycle power plant A2PP is not designed or intended for base load generation. Therefore, the SB 1368 limitation does not apply to this facility.

NOTEWORTHY PUBLIC BENEFITS

Electricity is produced by operation of inter-connected generation resources and, by knowing the fuel used by the generation sector, the resulting GHG emissions can be known. The operation of A2PP would affect the overall electricity system operation and GHG emissions in several ways:

- A2PP would provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation.
- A2PP would displace some less efficient local generation in the dispatch order of gas-fired facilities that are required to provide electricity reliability in the TID system.
- A2PP would facilitate to some degree the replacement of out-of-state coal electricity generation that must be phased out in conformance with the State's new Emissions Performance Standard.
- A2PP could facilitate to some extent the replacement of generation provided by aging power plants that use once-through cooling.

The project would likely lead to a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state's power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant. Moreover, it would be consistent with AB 32 goals.

The energy displaced by the proposed A2PP would result in a reduction in GHG emissions from the electricity system compared to other peaking generation. In other system roles, as described in **Greenhouse Gas Table 8**, the proposed A2PP would be able to minimize its GHG impacts by filling most of the expected future roles for gas-fired generation, in a high-renewables, low-GHG system.

Greenhouse Gas Table 8
A2PP, Summary of Role in Providing Energy and Capacity Resources

Services Provided by Generating Resources	Discussion, A2PP
Integration of Renewable Energy	• Would provide fast startup capability (within 2 hours). • Would provide rapid ramping capability. • Would have ability to provide regulation and reserves, and energy when renewable resources are unavailable.
Local Generation Displacement	• Would be able to satisfy/partially satisfy local capacity area (LCA) resource requirements. • Would provide voltage support. • *Would not* provide black start capability.
Ancillary Services, Grid System, and Emergency Support	• Would provide fast start-up capability (within 2 hours). • Would have low minimum load levels. • Would provide rapid ramping capability. • Would have ability to provide regulation and reserves. • *Would not* provide black start capability.
General Energy Support	• Would provide general energy support. • Could facilitate some retirements and replacements • Would provide cost-competitive energy. • Would be able to help a load-serving entity (LSE) meet resource adequacy (RA) requirements.

Source: Energy Commission staff; based on: Expected Roles for Gas-Fired Generation (CEC2009b, p. 7).

CONCLUSIONS

A2PP would be an efficient, new, dispatchable natural gas-fired simple-cycle power plant that would cause GHG emissions while generating electricity for California consumers. AB 32 emphasizes that GHG emission reductions must be “big picture” reductions that do not lead to “leakage” of such reductions to other states or countries. The project’s GHG emissions per MWh would be lower than those of other peaking generation that the project would displace and, thus, would contribute to continued improvement of the California and overall Western Electricity Coordinating Council system’s GHG emissions and GHG emission rate average.

The project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state’s power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant.

Staff notes that mandatory reporting of GHG emissions per Air Resources Board greenhouse gas regulations would occur, and this would enable the ARB to gather the information needed to regulate the A2PP in trading markets if required by the regulations implementing the California Global Warming Solutions Act of 2006 (AB 32). The project may be subject to additional reporting requirements and GHG reduction or trading requirements as these regulations are more fully developed and implemented by ARB and U.S. EPA.

Staff does not believe that the minor GHG emission increases from construction activities would be significant for several reasons. First, the period of construction would be short-term and the emissions intermittent during that period, not ongoing during the life of the project. Additionally, control measures, or best practices, that staff recommends for minimizing criteria pollutants, such as limiting construction vehicle idling times and requiring, as appropriate, equipment that meets the latest emissions standards, would further minimize greenhouse gas emissions since staff believes that the use of newer equipment would increase fuel efficiency and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment. For all these reasons, staff concludes that the short-term emission of greenhouse gases during construction would be substantially reduced and would, therefore, not be significant.

The A2PP would exceed the Emission Performance Standard in SB 1368 for base load generation, but as a simple-cycle power plant, A2PP is not designed or intended for base load generation. Therefore, the SB 1368 requirements do not apply to A2PP.

PROPOSED CONDITIONS OF CERTIFICATION

None proposed. The project owner would comply with mandatory ARB GHG emissions reporting regulations (California Code of Regulations, tit. 17, section 95100 et. seq.) and/or future GHG regulations formulated by the ARB and U.S. EPA, such as limits set by GHG emissions cap and trade markets.

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BIOLOGICAL RESOURCES

Testimony of David Bise

SUMMARY OF CONCLUSIONS

This section summarizes the Energy Commission staff's analysis and conclusions about the impacts of the Almond 2 Power Plant (A2PP) project on biological resources, briefly describes appropriate mitigation for those impacts, and identifies issues that require resolution before finalizing the mitigation recommendations. The proposed A2PP site is located within a previously disturbed area adjacent to the existing Almond power plant. The proposed site and the adjacent laydown area have been previously graded or excavated and are sparsely vegetated with primarily ruderal plant species. They, therefore, have limited habitat value for sensitive or special status plant and wildlife species. The 13.4-mile gas pipeline alignment associated with the project is proposed for road shoulders and margins of active and fallow agricultural fields. The pipeline alignment also crosses several active agricultural canals. These environments provide limited habitat for special status species including fairy shrimp species, western pond turtle, giant garter snake, western burrowing owl, Swainson's hawk, northern harrier, loggerhead shrike, American badger, and San Joaquin kit fox. The pipeline alignment and transmission line corridor may result in temporary impacts and habitat loss for these and other local wildlife species.

Staff has proposed conditions of certification intended to reduce project-related impacts to plant and wildlife species to less than significant levels. Implementation of applicant mitigation measures and staff's proposed conditions of certification would reduce impacts to these species to below the level of significance.

The project proponent has not received confirmation from the Army Corps of Engineers (ACOE), the regional water quality control board, or the California Department of Fish and Game (CDFG) as to whether waters of the U.S., state waters, or features subject to CDFG jurisdiction are present on the proposed A2PP site or within the disturbance areas of the associated gas pipeline or transmission lines. The project applicant will also be performing a rare plant survey for the proposed gas pipeline alignment in the spring of 2010. The findings of the rare plant survey and the determination as to whether jurisdictional waters will be impacted by construction of the A2PP or its associated infrastructure will be required and incorporated into the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP).

INTRODUCTION

This section of the Staff Assessment (SA) provides the California Energy Commission staff's analysis of potential impacts to biological resources from the construction and operation of the proposed A2PP. Information provided in this document addresses potential impacts to special-status plant and wildlife species and areas of critical biological concern associated with construction and operation of the A2PP, the 13.4-mile natural gas pipeline, and the associated transmission lines. This analysis also describes the biological resources at the project site and at the locations of associated linear pipeline and transmission features. This document explains the need for impact

avoidance and minimization measures and mitigation, evaluates the adequacy of mitigation proposed by the applicant, and specifies additional mitigation measures to reduce impacts to biological resources to less-than-significant levels. It also describes compliance with applicable laws, ordinances, regulations, and standards (LORS) and recommends conditions of certification.

This analysis is based, in part, upon information provided in the A2PP Application for Certification (TID 2009a) and other submittals, responses to staff data requests (CH2MHILL 2009k), a site visit by Energy Commission staff on January 15, 2010, and communications with representatives from the CDFG, USFWS, and independent research.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

During project construction and operation, A2PP would need to comply with the laws, ordinances, regulations, and standards (LORS) presented in **Biological Resources Table 1** below.

Biological Resources Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Endangered Species Act (Title 16, United States Code, sections 1531 et seq.; Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for the protection of threatened and endangered plant and animal species and their critical habitat. The administering agency is USFWS.
Fish and Wildlife Coordination Act (Title 16, United States Code, section 661)	Requires all federal agencies to coordinate with the USFWS in the preservation of fish and wildlife implementing federal actions.
Permit for take under the Bald and Golden Eagle Protection Act, (Title 50, Code of Federal Regulations, section 22.26)	Authorizes limited take of bald eagles and golden eagles under the Bald and Golden Eagle Protection Act, where the taking is associated with, but not the purpose of the activity, and cannot practicably be avoided.
Permit for take under the Bald and Golden Eagle Protection Act, (Title 50, Code of Federal Regulations, section 22.27)	Authorizes intentional take of eagle nests where: necessary to alleviate a safety hazard to people or eagles; necessary to ensure public health and safety; the nest prevents the use of a human-engineered structure; the activity, or mitigation for the activity, will provide a net benefit to eagles; and only allows inactive nests to be taken except in the case of safety emergencies.
Bald and Golden Eagle Protection Act (Title 16, United States Code section 668)	This law provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
Migratory Bird Treaty Act (Title 16, United States Code,	Prohibits the take or possession of any migratory nongame bird (or any part of such migratory nongame bird), including nests with viable eggs.

Applicable Law	Description
sections 703–711)	As defined, includes nearly every nongame bird in the state. The administering agency is USFWS.
State	
California Endangered Species Act (Fish and Game Code, sections 2050 et seq.)	Protects California's rare, threatened, and endangered species. The administering agency is CDFG.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals that are classified as rare, threatened, or endangered in California. The administering agency is CDFG.
California Species Preservation Act of 1970 (California Fish and Game Code 900-903)	Requires the protection and enhancement of birds, mammals, fishes, amphibians, and reptiles of California. Administering agency is CDFG.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Designates certain bird, mammal, reptile, amphibian, and fish species as fully protected, and prohibits take of such species. The administering agency is CDFG.
Native Plant Protection Act (Fish and Game Code, section 1900 et seq.)	Designates rare, threatened, and endangered plants in California and prohibits the taking of listed plants. The administering agency is CDFG.
Nest or Eggs (Fish and Game Code, section 3503)	Prohibits take, possession, or needless destruction of the nest or eggs of any bird. The administering agency is CDFG.
Birds of Prey (Fish and Game Code section 3503.5)	Specifically protects California's birds of prey in the orders Falconiformes and Strigiformes by making it unlawful to take, possess, or destroy any such birds or to take, possess, or destroy the nests or eggs of any such bird. The administering agency is CDFG.
Migratory Birds (Fish and Game Code, section 3513)	Prohibits take or possession of any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird. The administering agency is CDFG.
Local	
Stanislaus County General Plan	The Stanislaus County General Plan provides goals and objectives including preservation of natural areas in open space and parks, conserve water and protect water quality, provide for long-term protection and use of agricultural lands, provide recreational opportunities for county residents, reserve lands subject to natural disasters as open space in order to protect property and life, and preserve air quality. The plan sets forth policies to meet these goals (Stanislaus County 2010).
City of Ceres General Plan	The City of Ceres general plan provides goals and objectives for management of natural resources including native plant and wildlife species. Preservation of agricultural lands is a primary objective of the plan.

SETTING

REGIONAL SETTING

The A2PP site is located within the City of Ceres in Stanislaus County. The project site is located in the northern San Joaquin Valley. Land use in the vicinity of the project is primarily agricultural and light industrial with the urban areas of Modesto and Stockton to the north of the project site. The San Joaquin River is located approximately 7.5 miles southwest of the site. Natural waterways in the vicinity of the site generally drain to the San Joaquin River (TID 2009a).

PROJECT SITE AND VICINITY DESCRIPTION

The Turlock Irrigation District (TID) is proposing to construct a 174-MW natural gas fired power plant (A2PP). The proposed A2PP site is located on a 4.6-acre site immediately adjacent to the existing 48-MW Almond I Power Plant. An existing WinCo distribution center is located to the west, a farm supply company is located to the north, light industrial areas are located to the east, and agricultural fields are located to the south (TID 2009a). Associated project elements with the A2PP project include a proposed 13.4-mile natural gas pipeline (11.6 miles of new pipeline and 1.8 miles of reinforcement of existing pipeline) connecting the A2PP to the existing PG&E Line 215 to the south of the A2PP, two new 115-kilovolt (kV) transmission lines, one 0.9 mile long and one 1.2 miles long, and reconductoring of 2.9 miles of an existing 69-kV line.

Existing Vegetation, Wildlife, and Habitats

Power plant

Biological surveys were conducted by the applicant in 2009 for the A2PP (TID 2009a). The proposed power plant site is located within the existing fenced location for the current Almond I Power Plant. It was initially used as a borrow pit for construction of the WinCo distribution center to the west. It has subsequently been filled and is essentially devoid of vegetation with the exception of some ruderal plant species (TID 2009a). The associated laydown area for use during A2PP construction is located on an old borrow pit immediately to the north of the A2PP site that was excavated in 2008. The laydown area contains an artificial basin that was created from soil borrow activities for the WinCo distribution center. The proposed laydown area is currently having a wetland delineation performed to determine if jurisdictional waters are present on this portion of the site (TID 2009a). The staging area is generally vegetated with ruderal vegetation such as Russian thistle (*Salsola tragus*), pampas grass (*Cortaderia jubata*), red-stem filaree (*Erodium* sp.), and wild radish (*Raphanus raphanistrum*) (TID 2009a).

Transmission Lines

The proposed new transmission lines will be located in road shoulders and active and fallow agricultural fields and orchards. While these areas are not sensitive habitat types, they do provide potential nesting and foraging habitat for some special-status wildlife species.

The existing line that is proposed for reconductoring is partially located in a previously disturbed right-of-way (ROW) that includes a portion of an existing railroad line that is heavily disturbed and is maintained by the railroad to keep the tracks clear and to allow

for track maintenance. The remainder of the alignment is located in commercial and residential areas that have been previously developed. The reconductored transmission line has very limited to no potential to support special-status plant or wildlife species. Local bird species would be expected to periodically use the line for perching and foraging.

Natural Gas Pipeline

The proposed gas line alignment will be located in road shoulders and active and fallow agricultural fields and orchards. While these areas are not sensitive habitat types, they do provide potential nesting and foraging habitat for some special-status wildlife species.

Special-Status Species

Biological Resources Table 2 below lists the special-status species being considered in this staff assessment. A 2010 records search of the California Natural Diversity Database (CNDDB) for the nine-quad area centered on the project area returned occurrence records for a number of special-status plant and wildlife species (CDFG 2010). Of those, 15 are being considered for project-related impacts in this staff assessment. Reasons for their inclusion in **Biological Resources Table 2** are provided in the table, and species that were excluded from further consideration are discussed immediately following the table. In this staff assessment, special-status species are defined as plant and animal species that are state or federally listed or proposed for listing; state fully protected; candidates for state or federal listing; state species of special concern; and California Native Plant Society (CNPS) List 1A and 1B plants.

Biological Resources Table 2
Special-status Species Potentially Occurring
In or Near the A2PP Project Area

Common Name (Scientific Name)	Status (State/Federal/CNPS)	Potential for Occurrence
Plants		
Lesser saltscale (*Atriplex minuscula*)	__/__/1B	None; found in alkaline flats associated with sandy soils. Marginal habitat present within study area. Species surveyed for in 2009 with negative results.
Heartscale (*Atriplex cordulata*)	__/__/1B	None; found in alkaline flats associated with sandy soils. Marginal habitat present within study area. Species surveyed for in 2009 with negative results.
Vernal pool smallscale (*Atriplex persistens*)	__/__/1B	None; found in alkaline flats associated with sandy soils. Marginal habitat present within study area. Species surveyed for in 2009 with negative results.
Alkali milk-vetch (*Astragalus tener* var. *tener*)	__/__/1B	None; found in alkaline flats associated with sandy soils. Marginal habitat present within study area. Species surveyed for in 2009 with negative results.

Common Name (Scientific Name)	Status (State/Federal/CNPS)	Potential for Occurrence
Succulent owl's clover (*Castilleja campestris* ssp. *succulenta*)	CE/FT/1B	None; found in vernal pools. Suitable habitat not present.
Beaked clarkia (*Clarkia rostrata*)	__/__/1B	None; found in woodland habitats generally at higher elevations than project site. Surveyed for in 2009 with negative results.
Hoover's spurge (*Chamaesyce hooveri*)	__/FT/1B	None; found in vernal pools. Suitable habitat not present.
Colusa grass (*Neostapfia colusana*)	CE/FT/1B	None; found in vernal pools. Suitable habitat not present.
San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*)	CE/FT/1B	None; found in vernal pools. Suitable habitat not present.
Hairy Orcutt grass (*Orcuttia pilosa*)	CE/FE/1B	None; found in vernal pools. Suitable habitat not present.
Hartweg's golden sunburst (*Pseudobahia bahiifolia*)	CE/FE/1B	None; found in grasslands near cismontane woodlands in sandy soils. Suitable habitat not present.
Greene's tuctoria (*Tuctoria greenei*)	__/FE/1B	None; found in vernal pools. Suitable habitat not present.
Merced monardella (*Monardella leucocephala*)	__/__/1A	Low; found in foothill grasslands with sandy soils. Surveyed in 2009 with negative results. Presumed extinct in California. Follow-up surveys to be conducted in spring of 2010.
Big tarplant (*Blepharizonia*) *plumosa*)	__/__/1B	None; found in valley grasslands. Native habitat essentially absent from project area. Surveyed for in 2009 with negative results.
Delta button celery (*Eryngium racemosum*)	CE/__/1B	None; found in riparian clay flats. Suitable habitat not present.
Hispid bird's beak (*Cordylanthus mollis* ssp. *hispidus*)	__/__/1B	None; found in moist alkaline meadows in valley grasslands. Suitable habitat not present.
Sanford's arrowhead (*Sagittaria sanfordii*)	__/__/1B	None; vegetated canals contain marginal habitat for the species. Species surveyed for in 2009 with negative results.
Invertebrates		
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	__/FE/__	None; two elderberry shrubs were found adjacent to the proposed gas pipeline alignment. The stems on both shrubs are all less than one inch in diameter and therefore do not provide suitable habitat for the species according to USFWS guidelines.
Molestan blister beetle (*Lytta molesta*)	CSC/__/__	None; species is associated with vernal pools of the Central Valley. No vernal pools are present on the site. Areas of ponded water within study area do not

Common Name (Scientific Name)	Status (State/Federal/CNPS)	Potential for Occurrence
		contain vernal pool vegetation upon which this species is dependent.
Conservancy fairy shrimp (*Branchinecta conservatio*)	__/FE/__	Low; no vernal pools are present within the project area. There is one cattle wallow within the preferred pipeline alignment that provides marginal habitat for fairy shrimp.
Longhorn fairy shrimp (*Branchinecta longiantenna*)	__/FE/__	Low; no vernal pools are present within the project area. There is one cattle wallow within the preferred pipeline alignment that provides marginal habitat for fairy shrimp.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	__/FT/__	Low; no vernal pools are present within the project area. There is one cattle wallow within the preferred pipeline alignment that provides marginal habitat for fairy shrimp.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	__/FE/__	Low; no vernal pools are present within the project area. There is one cattle wallow within the preferred pipeline alignment that provides marginal habitat for fairy shrimp.
Fish		
Green sturgeon (*Acipenser medirostris*)	CSC/FT/__	None; the project site and the associated areas for the transmission line and gas pipeline do not contain suitable habitat for this species. The Harding Drain and the Prairie Flower Drain near the southern terminus of the gas pipeline have a hydrological connection to the San Joaquin River. However, the Harding Drain and Prairie Flower Drain do not represent suitable habitat for this species and direct impacts to all canals for the gas pipeline will be avoided during construction.
Delta smelt (*Hypomesus transpacificus*)	CT/FT/__	None; the project site and the associated areas for the transmission line and gas pipeline do not contain suitable habitat for this species. The Harding Drain and the Prairie Flower Drain near the southern terminus of the gas pipeline have a hydrological connection to the San Joaquin River. However, the Harding Drain and Prairie Flower Drain do not represent suitable habitat for this species and direct impacts to all canals for the gas pipeline will be avoided during construction.
Central Valley steelhead (*Oncorhynchus mykiss*)	__/FT/__	None; the project site and the associated areas for the transmission line and gas pipeline do not contain suitable habitat for this species. The

Common Name (Scientific Name)	Status (State/Federal/CNPS)	Potential for Occurrence
		Harding Drain and Prairie Flower Drain near the southern terminus of the gas pipeline have a hydrological connection to the San Joaquin River. However, the Harding Drain and Prairie Flower Drain do not represent suitable habitat for this species and direct impacts to canals for the gas pipeline will be avoided during construction.
Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*)	__/FT/__	None; the project site and the associated areas for the transmission line and gas pipeline do not contain suitable habitat for this species. The Harding Drain and Prairie Flower Drain near the southern terminus of the gas pipeline have a hydrological connection to the San Joaquin River. However, the Harding Drain and Prairie Flower Drain do not represent suitable habitat for this species and direct impacts to all canals for the gas pipeline will be avoided during construction.
Sacramento splittail (*Pogonichthys macrolepidotus*)	CSC/__/__	None; the project site and the associated areas for the transmission line and gas pipeline do not contain suitable habitat for this species. The Harding Drain and Prairie Flower Drain near the southern terminus of the gas pipeline have a hydrological connection to the San Joaquin River. However, the Harding Drain and Prairie Flower Drain do not represent suitable habitat for this species and all direct impacts to canals for the gas pipeline will be avoided during construction.
Hardhead (*Mylopharodon conocephalus*)	CSC/__/__	None; the project site and the associated areas for the transmission line and gas pipeline do not contain suitable habitat for this species. The Harding Drain and Prairie Flower Drain near the southern terminus of the gas pipeline have a hydrological connection to the San Joaquin River. However, the Harding Drain and Prairie Flower Drain do not represent suitable habitat for this species and all direct impacts to canals for the gas pipeline will be avoided during construction.
Amphibians		
California red-legged frog (*Rana draytonii*)	CSC/FT/__	None; the site and the associated infrastructure do not include permanent water sources or other suitable habitat for this species.

Common Name (Scientific Name)	Status (State/Federal/CNPS)	Potential for Occurrence
California tiger salamander (*Ambystoma californiense*)	CSC/FT/__	None; the site and the associated infrastructure do not include appropriate breeding habitat (vernal pools) or upland refugia habitats (annual grasslands) suitable for this species.
Reptiles		
Giant garter snake (*Thamnophis gigas*)	ST/FT/__	Moderate; canals within gas pipeline alignment provide low to moderate suitable habitat for the species.
Western pond turtle (*Emys marmorata*)	CSC/__/__	Moderate; canals within gas pipeline alignment provide low to moderate suitable habitat for the species.
Birds		
Tricolored blackbird (*Agelaius tricolor*)	CSC/__/__	Low; some emergent vegetation is present in canals that will be crossed by the gas pipeline. Vegetation will not be impacted.
Burrowing owl (*Athene cunicularia*)	CSC/__/__	High; several ground squirrel burrows are present within or directly adjacent to the pipeline alignment that are suitable for use by this species.
Swainson's hawk (*Buteo swainsoni)*	ST/__/__	Present; species was observed nesting within 0.5 mile of the preferred gas pipeline alignment during biological assessments (TID 2009a). Areas adjacent to the natural gas pipeline alignment are suitable foraging habitat for this species.
Northern harrier (*Circus cyaneus*)	CSC/__/__	High; agricultural fields adjacent to pipeline alignment provide suitable foraging and nesting habitat.
White-tailed kite (*Elanus leucurus*)	SFP/__/__	High; agricultural fields adjacent to pipeline alignment provide suitable foraging and nesting habitat.
Loggerhead shrike (*Lanius ludovicianus*)	CSC/__/__	Present; agricultural fields adjacent to pipeline alignment provide suitable foraging and nesting habitat.
Mammals		
American badger (*Taxidea taxus*)	CSC/__/__	Low; margins of agricultural fields along gas pipeline provide marginal habitat for this species.
San Joaquin kit fox (*Vulpes macrotis mutica*)	ST/FE/__	Low; margins of agricultural fields along gas pipeline alignment provide marginal habitat for this species. One burrow, that has since collapsed, was found in 2009 along the pipeline alignment that is potentially large enough for kit fox although the burrow did not have the characteristic shape of a kit fox burrow (TID 2009a).

Status Codes:
State

CSC: California Species of Special Concern. Species of concern to CDFG because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.
SE: State listed as endangered
ST: State listed as threatened
SFP: Fully protected
WL: Watch List: includes species formerly on California Species of Special Concern List (Remsen 1978) but which did not meet the criteria for the current list of special concern bird species (Shuford and Gardali 2008).

Federal
FE: Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT: Federally listed, threatened: species likely to become endangered within the foreseeable future
BCC: Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities <http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf>

California Native Plant Society (CNPS 2010)
List 1A: Presumed Extinct in California
List 1B: Rare, threatened, or endangered in California and elsewhere
0.1: Seriously threatened in California (high degree/immediacy of threat)
0.2: Fairly threatened in California (moderate degree/immediacy of threat)
0.3: Not very threatened in California (low degree/immediacy of threats or no current threats known)

Potential to Occur:
Present: Species was observed during focused surveys or during biological assessment of site.
High: Suitable habitat is present within the proposed site: occurrence records exist for species in proximity to the site; species expected to occur on site
Moderate: Low quality suitable habitat is present within or near the proposed site; species was not identified during reconnaissance surveys of the site; species may occur on site
Low: Suitable habitat is not present on site; species not expected to occur on site

Special-status Species Excluded from Further Consideration

The following species were considered for the A2PP analysis but were excluded from consideration in the impact assessment for the reasons described in **Biological Resources Table 2:** lesser saltscale (*Atriplex minuscula*), heartscale (*Atriplex cordulata*), vernal pool smallscale (*Atriplex persistens*), alkali milk-vetch (*Astragalus tener* var. *tener*), succulent owl's clover (*Castilleja campestris* ssp. *succulenta*), beaked clarkia (*Clarkia rostrata*), Hoover's spurge (*Chamaesyce hooveri*), Colusa grass (*Neostapfia colusana*), San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*), hairy Orcutt grass (*Orcuttia pilosa*), Hartweg's golden sunburst (*Pseudobahaia bahiifolia*), Greene's tuctoria (*Tuctoria greenei*), big tarplant (*Blepharizonia*) *plumosa*), Delta button celery (*Eryngium racemosum*), Sanford's arrowhead (*Sagittaria sanfordii*), hispid bird's beak (*Cordylanthus mollis* ssp. *hispidus*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Molestan blister beetle (*Lytta molesta*), green sturgeon (*Acipenser medirostris*), delta smelt (*Hypomesus transpacificus*), Central Valley steelhead (*Oncorhynchus mykiss*), Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), Sacramento splittail (*Pogonichthys macrolepidotus*), hardhead (*Mylopharodon conocephalus*), California red-legged frog (*Rana draytonii*), and California tiger salamander (*Ambystoma californiense*).

Special-status Plants

A 2010 CNDDB and CNPS database search of the nine-quad area centered on the project area returned occurrence records for 17 special-status plants known to occur in the vicinity of the project site, the associated transmission corridors, and the gas pipeline corridor. They are included in **Biological Resources Table 2** above. Of these 17 species, only the Merced monardella (*Monardella leucocephala*) has an extremely limited potential to occur within the study area. Merced monardella is presumed extinct in California. However, it is known historically that the A2PP project area has some marginal habitat for the species. An initial special-status plant survey was conducted in

the fall of 2009 (CH2MHILL 2009k, Appendix E). Follow-up spring surveys have been proposed by the applicant and are expected to be conducted in 2010 to ensure that special-status plants, including this species, are not present within any designated construction areas or laydown areas.

Merced Monardella

Merced monardella was historically associated with annual grasslands with sandy soils in Merced and Stanislaus counties. This species is presumed extinct in California. The last known occurrence for this species is from 1941. The blooming period is between May and August (CNPS 2010). Given this species status in California, the potential for this species to occur within the A2PP project area is extremely low. A follow-up survey will be conducted in the spring of 2010 to ensure that this species does not occur on the project site or other areas that will be disturbed during project construction.

Special-status Wildlife

Wildlife species considered for this analysis include those from the 2010 CNDDB search of the nine-quad area centered on the project area, the USFWS list for the *Ceres* and *Crow's Landing* quadrangles, habitats present within the proposed project area as described in the AFC (TID 2009a), and a site visit conducted by staff in January 2010.

Fairy Shrimp

Four species of fairy shrimp including Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp are known to occur in the vicinity of the A2PP site. These species typically inhabit vernal pools and seasonal wetland habitats that remain inundated for a minimum of 21 days to allow the completion of a lifecycle for the species. The preferred pipeline alignment does not contain vernal pools. However, the alignment does contain one disturbed "cattle wallow" that ponds water during rain events for a sufficient time to support a life cycle for fairy shrimp species. This habitat is considered marginal for fairy shrimp due to the level of disturbance associated with this habitat from road traffic and agricultural activities and the lack of typical seasonal wetland vegetation within the feature.

Giant Garter Snake

The giant garter snake is found in agricultural wetlands, canals, freshwater lakes, and low-gradient streams in the Central Valley of California. Giant garter snakes are essentially aquatic during their active period (April-October) (USFWS 2009). Between November and March, they typically hibernate in small mammal burrows or soil cracks on the banks of streams, rivers, or canals. Giant garter snakes feed on small fish and amphibians. The breeding season is typically March through April and young are born from July through September (USFWS 2009). No giant garter snakes were observed during the biological assessment for the project site (TID 2009a). A habitat assessment of all the canals was performed by the project applicant in 2009 (CH2MHILL 2009k). The unlined canals within the gas pipeline alignment were determined to provide low to marginal habitat for this species.

Western Pond Turtle

The western pond turtle is found in suitable habitat throughout California west of the Sierra-Cascade ranges. Suitable habitat consists of ponds, canals, and low gradient streams with sufficient emergent vegetation to provide cover. Pond turtles feed on aquatic vegetation, small fishes, and frogs (Zeiner et. al 1988). Pond turtles typically require basking sites within suitable habitats. Nests are typically built along the beds of streams or ponds or in immediately adjacent upland areas out of the floodplain (Zeiner et. al 1988). No western pond turtles were found on the project site during the biological assessment. However, some of the unlined canals along the gas pipeline route contain marginal habitat for this species.

Tricolored Blackbird

The tricolored blackbird is in cismontane California, especially in the Central Valley. It is associated with freshwater marshes with emergent vegetation. Tricolored blackbirds feed primarily on insects, seeds, and grains. The species typically nests in dense emergent wetland vegetation such as tules or cattails (Zeiner et. al 1988). It is typically a colonial nester and therefore requires large wetland areas for breeding. No tricolored blackbirds were found during the biological assessment (TID 2009a). Some of the canals that are proposed to be crossed by the gas pipeline provide marginal foraging habitat for this species. It is unlikely that breeding colonies would be supported by these canals because of the limited amount of emergent wetland vegetation contained in them.

Western Burrowing Owl

Western burrowing owls (WBOs) inhabit arid lands throughout much of the western United States and southern interior of western Canada (Haug et al. 1993). In many other areas, this species has declined because of habitat modification, poisoning of its prey, and introduced nest predators. The WBO is diurnal and usually non-migratory in this portion of its range.

WBOs are unique among the North American owls in that they nest and roost in abandoned burrows, especially those created by ground squirrels, kit fox (*Vulpes macrotis*), and other wildlife. WBOs have a strong affinity for previously occupied nesting and wintering habitats. They often return to burrows used in previous years, especially if they were successful at reproducing there in previous years (Gervais et al. 2008). The breeding season (defined as from pair bonding to fledging) generally occurs from February to August with peak breeding activity from April through July (Haug et al. 1993).

WBOs tend to be opportunistic feeders. Large arthropods, mainly beetles and grasshoppers, comprise a large portion of their diet. Small mammals, especially mice and voles (*Microtus*, *Peromyscus*, and *Mus* spp.), are also important food items for WBOs. Other prey animals include reptiles and amphibians, young cottontail rabbits (*Sylvilagus* sp.), bats, and birds, such as sparrows and horned larks (*Eremophila alpestris*). Consumption of insects increases during the breeding season (Haug et al. 1993). WBOs in California are generally nonmigratory and most abundant in the Central

and Imperial valleys, primarily in agricultural areas. Small, scattered populations occur in the Mojave Desert.

No WBOs were found by the project applicant during surveys in 2009. The A2PP site generally does not have suitable habitat for WBOs due to the level of disturbance. The proposed reconductoring alignment has potential habitat for WBO, especially within the railroad berm that is located adjacent to the existing transmission line. The gas pipeline alignment also contains suitable habitat for this species and several small mammal burrows are present within or immediately adjacent to the alignment that are suitable for use by WBOs (TID 2009a).

Swainson's Hawk

The Swainson's hawk was once one of the most common birds of prey in the grasslands of California and nested in the majority of the lowland areas of the state. Currently, the nesting range is primarily restricted to portions of the Sacramento and San Joaquin valleys, northeast California, and the Western Mojave, including the Antelope Valley (Zeiner et. al. 1988). The Swainson's hawk requires large amounts of foraging habitat, preferably grassland or pasture habitats. Its preferred prey includes voles (*Microtus* spp.), gophers, birds, and insects such as grasshoppers (Zeiner et. al. 1988). It has adapted to the use of some croplands, particularly alfalfa, as well as grain, tomatoes, and beets (Estep 1989). Crops such as cotton, corn, rice, orchards, and vineyards are not suitable because they either lack suitable prey, or prey is unavailable to the hawks due to crop structure. Swainson's hawks often establish territories in riparian systems adjacent to suitable foraging habitats as well as utilizing lone trees or groves of trees in agricultural fields. Suitable foraging and nesting habitat occurs within the project area, on the natural gas pipeline alignment. Nesting Swainson's hawks have been observed within 0.5 mile of the proposed pipeline alignment (TID 2009a).

Northern Harrier

Northern harriers are found in open grasslands and meadow habitats. Harriers feed primarily on small mammals, birds, and amphibians. Nests are placed on the ground or in low-growing shrubs (Zeiner et. al. 1988). The breeding season is typically April through September. Reduction in wetlands and grassland habitats has reduced nesting and foraging acreage for this species in California. No northern harriers were observed during biological surveys of the area (TID 2009a). Fallow agricultural fields within and directly adjacent to the gas pipeline alignment provide potential nesting and foraging habitat for this species.

White-tailed kite

The white-tailed kite is a yearlong resident in Central Valley lowlands. It is often found near agricultural fields. It preys on small mammals, birds, and insects. It forages in open grasslands, meadows, and open agricultural fields. Kites nest in the tops of oaks, willows, or other trees near foraging habitat (Zeiner et. al. 1988). No white-tailed kites were observed during the biological assessment of the site (TID 2009a). However, the agricultural fields adjacent to the gas pipeline alignment provides suitable foraging habitat for this species and there are suitable nesting trees directly adjacent to the pipeline alignment.

Loggerhead Shrike

Loggerhead shrikes are widespread in California and can be locally common in some areas. Loggerhead shrikes initiate their breeding season in February and may continue with raising a second brood as late as July; they often re-nest if their first nest fails or to raise a second brood (Yosef 1996). This species can be found within lowland, open habitat types, including creosote scrub and other desert habitats, sage scrub, non-native grasslands, chaparral, riparian, croplands, and areas characterized by open scattered trees and shrubs. Fences, posts, or other potential perches are typically present. In general, loggerhead shrikes prey upon large insects, small birds, amphibians, reptiles, and small rodents over open ground within areas of short vegetation, usually impaling prey on thorns, wire barbs, or sharp twigs to cache for later feeding (Yosef 1996). This species was observed within the project site during biological assessments (TID 2009a).

American Badger

American badgers were once fairly widespread throughout open grassland habitats of California. They are now uncommon, permanent residents throughout most of the state, with the exception of the northern North Coast area. They are most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. In the southwest, badgers are typically associated with creosote bush scrub and sagebrush. Mating occurs in late summer or early fall and two to three young are born 183 to 265 days later in March or April (Long 1973). Badgers are fossorial mammals. They dig large burrows in dry, friable soils and use multiple dens/cover burrows within their home range. They typically use a different den every day, although they can use a den for a few days at a time (Sullivan 1996). Cover burrows are an average of 30 feet in length, and are approximately three feet in depth. Natal dens are larger and more complex than cover dens. In undisturbed, high-quality habitat, badger dens can average 0.64 dens per acre, but are much lower in highly disturbed areas (Sullivan 1996). The American badger is likely to den in the vicinity of the project site and could potentially den or forage within the gas pipeline alignment although disturbance associated with agricultural activities likely reduces the potential for occurrence. No American badgers were observed during biological surveys of the study area.

San Joaquin Kit Fox

The San Joaquin kit fox, a federally endangered and state-threatened species, is primarily nocturnal, but are commonly seen during the day in late spring and early summer (Orloff et al. 1986). This species typically occurs in valley and foothill grassland, or mixed shrub/grassland habitats throughout low, rolling hills and valleys and also utilize habitats that have been altered by humans (e.g., agricultural land, oil fields). San Joaquin kit foxes can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally within these agricultural areas (Cypher et al 2007). Warrick et al. (2007) found that San Joaquin kit foxes in an agricultural setting typically denned in small patches of grassland, but that 40-50% of their nocturnal locations were in row crops or orchards. Kit foxes change dens frequently, sometimes only using a den for two or three days. They often enlarge ground squirrel burrows for use as a den and may use vacant badger dens for shelter (USFWS 1998), both of which occur within the proposed project area. Loss and

degradation of habitat by agricultural, industrial, and urban development and associated practices continue to decrease available habitat. Hunting, road kill, and reduction of prey populations by poisoning have contributed to the species decline (USFWS 1998). One potential kit fox burrow was found during surveys conducted in 2009 (TID 2009a) within 50 feet of the proposed pipeline alignment. The burrow has collapsed since being originally found in 2009.

Water Resources, Wetlands, Waters of the US, Waters of the State

The project applicant is submitting a wetland delineation for the plant site, laydown area and the pipeline alignment in 2010 to the ACOE and CDFG (TID 2009a). The ACOE and CDFG will make a determination regarding the extent of jurisdictional features within the project site. The site contains “puddles” and other seasonally wet areas that could potentially be considered waters of the state. These seasonal features are to be mapped and avoided during project construction with the exception of one “cattle wallow” that may contain suitable habitat for fairy shrimp species. This feature will not be directly impacted by the pipeline construction, but the feature is within 250 feet of pipeline construction and therefore may require mitigation according to USFWS guidelines (TID 2009a). Any canal crossings for the gas pipeline will be constructed with “bore and jack” or directional drilling techniques (TID 2009a) to avoid directly impacting these areas. Therefore, direct impacts to these features are not expected to occur. However, CDFG has indicated that the project will likely require a streambed alteration agreement for crossings under the Harding Drain and the Prairie Flower Drain which have hydrological connections to the San Joaquin River. It is also assumed that these crossings will be under the jurisdiction of the ACOE due to this hydrologic connection to a navigable water. However, this has not yet been confirmed by the ACOE.

The A2PP’s water source will be the City of Ceres Wastewater Treatment Plant (WWTP). The A2PP facility will access the water through an existing pipeline for the Almond I facility.

Stormwater runoff will be routed to a new onsite detention pond that will be constructed within the 4.6-acre site. The detention pond will only be used to store runoff similar to the existing detention pond for the existing Almond I Power Plant. The current pond only stores water for a few days immediately after storm events to a depth of 2 or 3 inches. There is no significant bird utilization of the current pond due to this limited water storage time and no mitigation measures are currently employed for this existing detention pond to avoid impacts to migratory birds.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The following section discusses potential impacts that could occur to biological resources and describes mitigation to reduce impacts to biological resources where applicable.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Significant impacts to biological resources would occur if special-status species or species otherwise protected by state and federal statute are likely to be impacted by

construction or operation of the proposed project. A proposed project would have a significant impact to biological resources if it would:

- interrupt migration,
- reduce native fish, wildlife, and plant habitat,
- cause a fish or wildlife population to drop below self-sustaining levels, or
- disturb or degrade wetlands, marshes, riparian areas, or other wildlife habitat.

Harassment of a protected species that caused adverse behavioral changes would also be considered significant; harassment is considered “take” under state and federal endangered species acts.

DIRECT AND INDIRECT IMPACTS AND MITIGATION

Direct impacts are a result of construction or operation of the project and occur at the same time and place as project activities. Direct impacts of A2PP could include permanent or temporary direct loss of habitat associated with construction of the gas pipeline, mortality of animals occupying burrows when ground is broken or equipment is parked over burrows or disturbance during construction and operation that causes nest abandonment. These impacts would be temporary because the pipeline alignment would be revegetated after construction and the pipeline alignment does not contain any sensitive vegetation communities. Indirect impacts are caused by the project, but occur later in time or are farther removed in distance. Indirect impacts from the project could include lighting of the new facility or noise impacts that discourage wildlife usage adjacent to the A2PP.

This section analyzes the potential for direct and indirect impacts of construction and operation of the proposed project to biological resources and suggests impact avoidance, minimization, and mitigation measures to reduce the severity of potentially adverse impacts. Applicant-proposed conditions from the AFC were incorporated into staff’s Conditions of Certification where appropriate.

Construction Impacts and Mitigation

The proposed project consists of various components related to construction of a new 174-MW power plant adjacent to the current 48-MW Almond I power plant, construction of two new 115-kilovolt (kV) lines, reconductoring of an existing 69-kV line, and construction of a 13.4-mile natural gas pipeline. Construction of the A2PP would occur within a previously disturbed site.

- Power Plant Site

  The proposed plant site is located on a 4.6-acre site within the existing fenced facility for the Almond I plant site. The site is generally disturbed and supports only ruderal vegetation which does not provide habitat for sensitive plant or wildlife species. Common wildlife species that are acclimated to human disturbance may utilize some of the perimeter areas of the power plant for roosting or perching. No significant impacts to biological resources are expected during construction of the A2PP. Therefore, no further discussion of potential impacts associated with construction of

the A2PP will be done in this section. Some impacts associated with operation of the A2PP may occur that are discussed later in this section.

- Laydown Area

  The proposed laydown area is located on a 1.85-acre soil borrow pit immediately north of the proposed power plant site that was utilized during construction of the adjacent WinCo distribution center. There is some evidence of wetland vegetation and hydrology within the borrow area due to the topography associated with the borrow pit. The applicant is in the process of preparing and submitting a wetland delineation to ACOE and CDFG to determine if waters of the U.S. or waters of the state are present within the proposed laydown area. Impacts to federal or state-jurisdictional wetlands would require appropriate permits and would include mitigation requirements for issuance of a permit. The mitigation requirements of the permits will be included in the conditions of certification for the A2PP and the final BRMIMP. The laydown area does not provide habitat for sensitive plant or wildlife species and will not be permanently impacted. Therefore, no further discussion of the laydown area will be included in this impacts section and no specific mitigation is prescribed for this area. As mentioned previously, if jurisdictional wetlands are present within the laydown area, mitigation would be required for impacts to these features.

- Transmission Lines

  The two segments of new transmission lines will be located in disturbed or developed road shoulders or agricultural fields. Corridor 1 will be 0.9 mile long and will permanently impact 0.0017 acre of land for transmission tower footings. Corridor 2 will be 1.2 miles long and will permanently impact 0.0023 acre of land for transmission tower footings. There will also be temporary impacts associated with parked equipment to string wire between towers for both alignments. This construction may result in temporary impacts to wildlife species located within the transmission corridors.

  A portion of an existing transmission corridor from the Almond 1 site will be reconductored. The existing transmission corridor is located in disturbed or developed areas. This activity may result in temporary disturbance to wildlife species within the corridor from stringing equipment parked between existing towers. No permanent impacts are associated with reconductoring the existing line.

- Natural Gas Pipeline

  A 13.4-mile natural gas pipeline (11.6 miles of new pipeline and 1.8 miles of pipeline reinforcement) is proposed to connect the A2PP to the existing PG&E Line 215 pipeline (TID 2009a). The pipeline is proposed to be placed in the shoulders of existing roads and the edges of active and fallow agricultural fields. No natural or sensitive vegetation communities would be impacted by pipeline construction. However, these agricultural fields provide potential habitat for some special-status wildlife species and marginal habitat for special-status plants. These plants and animals could be impacted during pipeline construction. These impacts would be expected to be temporary since the pipeline corridor would be revegetated after construction is complete. Details of potential impacts are provided below.

The pipeline alignment will cross several irrigation canals between the A2PP and the existing PG&E Line 215. Any canal crossings for the pipeline will be performed using directional drilling technique such as jack and bore to avoid direct impacts to the canals. However, depending on the drilling technique used, there is the potential for a “frac-out”, or drilling mud spill, to occur during the drilling process. Drilling mud has the potential to negatively affect downstream water quality if it enters canals. The Harding Drain and Prairie Flower Drain at the southern terminus of the gas pipeline alignment have a hydrological connection to the San Joaquin River. Therefore, introduction of drilling mud in the Harding Drain or in Prairie Flower Drain would have a significant impact on water quality and subsequently on aquatic species within the San Joaquin River.

Construction Impacts to General Vegetation

Construction impacts to vegetation within the pipeline corridor could occur in a variety of ways, including the direct removal of plants during construction. As these impacts are generally localized and are primarily temporary, they are not usually considered significant unless the habitat type is regionally unique or is known to support special-status species. The preferred gas pipeline alignment is primarily within active and fallow agricultural fields and dairy farms. The area is surrounded by uplands being actively used for agriculture or otherwise disturbed habitats. The exact impact acreage to vegetation communities from the gas pipeline cannot be calculated at this time because the gas pipeline placement within the right-of-way may be moved slightly to avoid impacts to sensitive wildlife species (TID 2009a). Since these impacts are temporary and would not affect sensitive vegetation communities, these impacts are not considered significant and no mitigation is proposed in regards to impacts to general vegetation.

Construction activities associated with construction of two new transmission corridors would require the permanent removal of 0.004 acre of ruderal upland vegetation associated with placement of transmission towers (TID 2009a). Temporary impacts to ruderal vegetation may occur during stringing of new wire for the new transmission lines and during reconductoring of the existing line. Significant impacts to native vegetation are not expected and no mitigation is proposed for these activities.

Construction Impacts to Jurisdictional Waters

The extent of impacts to jurisdictional waters from project construction is currently unknown. The project applicant is submitting a wetland delineation to the ACOE and CDFG to determine the extent of jurisdictional features within the project footprint and whether impacts will occur to jurisdictional features. Harding Drain and Prairie Flower Drain are likely to be subject to ACOE and CDFG jurisdiction based on initial consultation with those agencies. If impacts to jurisdictional features cannot be avoided during construction, the appropriate permits and conditions will be required. Staff’s proposed condition of certification **BIO-14** (Compliance with CDFG SAA and ACOE Section 404 Measures) is designed to require the applicant to include any necessary measures to avoid or minimize impacts to jurisdictional waters and to fully mitigate impacts to jurisdictional features.

The Harding Drain and Prairie Flower Drain, which will be crossed by the gas pipeline, have a direct hydrological connection to the San Joaquin River (TID 2009a). Therefore, direct impacts to the water quality of the San Joaquin River could occur during drilling under these features if a frac-out occurred that resulted in the spilling of drilling mud into the canals. Staff has required the preparation of a frac-out containment plan (**BIO-8**) to avoid significant water quality impacts to the San Joaquin River Basin during pipeline construction.

Construction Impacts to General Wildlife

Direct loss of small mammals, reptiles, and other less-mobile species could occur during construction of the proposed gas pipeline and transmission corridors. This would result primarily from the use of construction vehicles, which could collapse underground burrows or drive over animals. Construction activities (including construction noise, lighting, and increased human presence) could disrupt breeding or foraging activities of some common wildlife species for the duration of construction.

Construction Impacts to Special-status Species

Plants

Project construction would occur entirely within agricultural areas or in ruderal uplands that are unlikely to support special-status plants. No special-status plants were found during focused surveys at the project site in 2009 (TID 2009a, CH2MHILL 2009k Appendix E). A follow-up survey for special-status plants is expected to be conducted in the spring of 2010. There is an extremely low probability that special-status plant species occur within the impact areas. In the event that special status plant species are found and they cannot be avoided, mitigation will be proposed. The gas pipeline alignment is the only area of the project that has even a low potential for special status plants to occur within the project footprint. The pipeline corridor may be able to be shifted slightly within the proposed right of way to avoid any special status plants. However, if avoidance is not possible, then mitigation for special-status plant species will be implemented (**BIO-16**). An additional condition of certification would be prepared for the staff assessment addendum that addresses project-related impacts to special-status plants, if necessary, based on the results of the 2010 plant surveys.

Wildlife

The proposed natural gas pipeline corridor and its immediate vicinity provides potential habitat for giant garter snake, western pond turtle, burrowing owl, loggerhead shrike, Swainson’s hawk, northern harrier, white-tailed kite, San Joaquin kit fox, and American badger. Some of the canals that would be crossed by the gas pipeline alignment provide limited potential habitat for giant garter snake and western pond turtle (TID 2009a). There is one ponded area within the preferred gas pipeline alignment that provides marginal habitat for various fairy shrimp species that are known to occur in the vicinity of the A2PP site.

Portions of the gas pipeline alignment could support denning and burrowing animals such as western burrowing owls, San Joaquin kit foxes, and American badgers. These species use or enlarge burrows, or dens, created by California ground squirrels, and both could potentially be within or directly adjacent to the pipeline alignment. Dens

within the pipeline alignment would likely be destroyed or be otherwise indirectly impacted by pipeline construction noise and dust. Animals occupying those dens, both within and adjacent to impacted areas could be disturbed or harmed during construction and may be subjected to ongoing impacts related to pipeline monitoring and maintenance after construction is completed. Staff's proposed conditions of certification **BIO-1** (Designated Biologist Selection), **BIO-2** (Designated Biologist Duties), **BIO-3** (Biological Monitor Selection), **BIO-4** (Designated Biologist and Biological Monitor Authority), **BIO-5** (Worker Environmental Awareness Program), **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan), **BIO-7** (Impact Avoidance Measures), **BIO-9** (Avoid Harassment or Harm to San Joaquin Kit Fox), **BIO-10** (Pre-construction Nesting Bird Surveys and Nest Monitoring), and **BIO-11** (Burrowing Owl Impact Avoidance and Minimization Measures) outline impact minimization and avoidance measures to avoid construction impacts to fossorial (burrowing) wildlife and other wildlife that could potentially be impacted by project construction. The applicant has proposed several mitigation measures during construction (TID 2009a, CH2MHILL 2009k) to reduce or avoid impacts to potentially occurring special-status wildlife species. These proposed measures are based upon agency guidelines for construction in areas that support habitat for giant garter snake (GGS), western pond turtle, western burrowing owl, Swainson's hawk, and San Joaquin kit fox. These same agency guidelines are the basis for many of staff's proposed conditions of certification and therefore mitigation proposed by the applicant is generally reflected in staff's proposed conditions.

Northern harriers, loggerhead shrikes, Swainson's hawks, burrowing owls, and other bird species protected by Fish and Game codes and the Migratory Bird Treaty Act could potentially nest or forage within or adjacent to the natural gas pipeline alignment. Construction of the pipeline during the nesting season could disrupt nesting behaviors or otherwise adversely affect reproductive success of species protected by CDFG Fish and Games codes or the Migratory Bird Treaty Act. Staff's proposed conditions of certification **BIO-5, BIO-6, BIO-7, BIO-10,** and **BIO-11** outline a number of impact avoidance and minimization measures for all of these bird species, including specific measures for burrowing owls and Swainson's hawks based on prescribed agency guidelines. **BIO-10** would require pre-construction surveys, which would detect the presence of nesting birds within or adjacent to the pipeline ROW and describe measures for monitoring of active nests up to 0.5 mile from construction areas. Applicant-proposed impact avoidance and minimization measures and staff's proposed conditions of certification would avoid impacts to nesting bird species or mitigate them to less-than-significant levels.

Some of the canals proposed for crossing by the natural gas pipeline have suitable habitat for GGS and western pond turtle. Construction within 200 feet of canals with suitable habitat for GGS and western pond turtle could result in mortality of individuals resulting from being crushed by construction equipment or from water quality degradation during pipeline drilling under the canals. Staff's proposed conditions of certification **BIO-8**, **BIO-12** (Giant Garter Snake and Western Pond Turtle Pre-construction Clearance Surveys), and **BIO-13** (Giant Garter Snake Avoidance and Minimization Measures) are based on existing agency guidelines for working within potential habitat for these species. These measures are expected to reduce impacts to GGS and western pond turtle to less than significant levels.

The preferred gas pipeline alignment contains one disturbed area that ponds water for a sufficient duration to provide marginal habitat for federally listed fairy shrimp species. Trenching through this feature during pipeline construction could result in mortality of adults if construction takes place during the rainy season or loss of cysts if construction takes place when the feature is dry. Construction could also result in soil compaction that may result in loss of suitability of the feature to provide suitable habitat for fairy shrimp in subsequent years due to changes in hydrology of the feature. Staff's proposed Condition of Certification **BIO-15** (Fairy Shrimp Surveys or Avoidance and Compensation Measures) would be expected to reduce project-related impacts to listed fairy shrimp species to less than significant levels.

Construction Noise and Vibration

Birds communicate primarily through vocalizations and auditory cues. Increased noise levels can interfere with normal communication, potentially interfering with maintenance of contact between mated birds, obscuring warning and distress calls that signify predators and other threats, and affecting feeding behavior and protection of young. High noise levels may also render an otherwise suitable nesting area unsuitable. Animals rely on hearing to avoid predators, obtain food, and communicate. Long-term exposure to noise can cause excessive stimulation to the nervous system and chronic stress that is harmful to health and reproductive fitness (Fletcher 1980, 1990). Behavioral and physiological responses to noise and vibration have the potential to cause injury, energy loss (from movement away from noise source), a decrease in food intake, habitat avoidance and abandonment, and reproductive losses (National Park Service 1994).

Studies have shown that noise levels over 60 dBA can affect the behavior of certain bird species. The applicant states that average noise levels from construction could be as high as 71 dBA at 375 feet from the noise source and as high as 59 dBA at 1,500 feet from the noise source (TID 2009a, Table 5.7-10). A2PP would comply with applicable LORS that deal with noise and vibration impacts to humans. Noise and vibration levels that do not cause physical injury or harm to humans would, at a minimum, not be expected to cause injury or harm to animals. However, there are other noise- and vibration-related impacts that could occur to wildlife. The construction-related vibration most likely to be perceived by wildlife off site would be pile driving, should it be employed (TID 2009a, pg. 5.7-19).

Staff's assessment of potential noise and vibration impacts incorporated the following seven biological considerations: 1) that existing habitat in the project area is degraded and of low quality; 2) that the project area is essentially surrounded by agriculture or some level of development and subsequent disturbance; 3) that wildlife would probably avoid the project area during the loudest construction activities; 4) that wildlife would likely habituate to construction noise to some degree or would maintain a distance comfortable to them; 5) that the project site does not provide essential habitat from which individuals would be excluded by project construction; 6) that sensitive wildlife are generally not expected to occur near the project area; and 7) that parts of the surrounding area are already relatively noisy due to the existing Almond 1 power plant

that currently occupies a portion of the site and agricultural activities that occur along the gas pipeline alignment. These considerations would not necessarily apply to every species or every eventuality, but they are generally true.

Staff proposes Condition of Certification **BIO-7** (Impact Avoidance Measures) to minimize impacts to nesting birds. The SA also incorporates staff's proposed measures into **NOISE-3** which requires a noise control program during construction. While this measure generally applies to human receptors, the measure will mitigate some construction noise impacts for wildlife as well. With implementation of these measures, and given the general wildlife considerations outlined above, staff believes that noise and vibration impacts from normal project construction would be temporary and less than significant.

Construction Lighting

Artificial lighting can significantly disturb wildlife. Among other adverse effects, it can prevent nocturnal insects from eating, mating, and migrating (Eisenbeis 2002, Frank 2002); it can increase predation on nocturnal insects by entrapping them at night lights (Svensson and Rydell 1998, Frank 2002); it can affect frog, salamander, and mammal reproduction, foraging, predator avoidance, and social interactions (Grigione 2002, Buchanan 2002); it can reduce dispersal, foraging, and reproductive opportunities (Grigione 2002); and it can attract birds flying at night or in inclement weather and cause both misorientation and disorientation (Rich and Longcore 2006).

Lighting for project construction would occur as necessary to maintain project schedules or to perform construction activities that are temperature sensitive. To the extent feasible, construction lighting will be directed to the center of the construction site and shielded to prevent fugitive light from escaping the site (TID 2009a, pg. 5.13-22). No mitigation measures are proposed for impacts to biological resources related to lighting because of the existing level of disturbance and lighting associated with the project area.

Reconductoring Impacts

Reconductoring would include one segment of existing 69-kilovolt (kV) PG&E sub-transmission line totaling approximately 2.9 miles. Reconductoring would involve replacing existing conductors with those of larger ampacity. Pull sites generally include a small staging area for a truck-mounted wire puller and support vehicles. Reconductoring would remove old conductors and install new ones. No other tower work would be involved. Ground-disturbing activities would be limited to parking vehicles along the alignments, and would require minimal vegetation disturbance and ground leveling. Most of the alignment follows existing roads and active agricultural fields, so pull sites would most likely be in previously disturbed areas. The towers and substations along the reconductoring segment provide potential roosting and nesting opportunities for common and special-status birds. Special-status animals, such as burrowing owls and kit foxes, could potentially use areas near pull sites that contain suitable burrows. These fossorial species could potentially be subject to mortality from construction equipment parking on burrows and crushing or entombing wildlife within their burrows. Staff discusses potential impacts to biological resources associated with

the A2PP and makes recommendations for minimizing impacts to biological resources during project construction but does not propose additional specific conditions of certification for reconductoring because potential impacts to biological resources are similar to those for other proposed infrastructure for the A2PP project. Impact avoidance measures **BIO-5**, **BIO-7**, **BIO-9**, **BIO-10**, and **BIO-11** would be required prior to initiation of reconductoring activities.

Operations Impacts

Potential direct impacts of A2PP operation would result from operational noise and vibration and from lights at night as well as the potential for collision of bat and bird species into stacks of the A2PP. These impacts are discussed below.

Detention Basin

Noncontact storm water from the plant site would be directed to an onsite detention basin, which would hold water temporarily following rain events. The basin would be within a fenced site but could potentially support bird foraging activity. The current detention pond associated with the Almond 1 plant does not pond water for more than 1 or 2 days and no significant bird activity has been associated with the current detention basin (TID staff, personal communication). The proposed detention basin would be operated in the same capacity as the current basin. Therefore, staff believes that the detention basin is unlikely to hold water long enough to attract significant numbers of birds. Staff believes that the A2PP detention basin would be neither an increased attractant nor an increased deterrent to local wildlife and therefore no mitigation is proposed for operation of the onsite detention basin.

Operational Noise and Vibration

A power plant operates as a steady, continuous, broadband noise source, unlike the intermittent sounds that comprise the majority of the noise environment. As such, power plant noise contributes to, and becomes part of, the background noise level, or the sound heard when most intermittent noises cease. Where power plant noise is audible, it will tend to define the background noise level. For this reason, staff compares the projected power plant noise to the existing ambient background noise levels at specific locations. If this comparison identifies a significant adverse impact, then feasible mitigation must be incorporated in the project to reduce or remove the impact. Since the Almond I power plant currently operates on the site, the noise from operation of the A2PP would not be expected to significantly differ from the existing background noise of the area. Therefore, no impact to biological resources related to operational noise is expected and no specific mitigation measures are proposed for A2PP operational noise.

Vibration from an operating power plant could be transmitted through the ground (groundborne vibration) and through the air (airborne vibration). Vibration associated with plant operation could make adjacent uplands less suitable for occupation by burrowing birds and animals. Groundborne vibration could affect both predators and prey, or airborne vibration could be sufficiently disturbing that foraging animals would lose adjacent areas as foraging habitat. Since the site is directly adjacent to the currently operating Almond 1 power plant, ground vibrations from operation of the A2PP are expected to be similar to the current background level. Therefore, impacts to biological resources from operation of the proposed A2PP are expected to be minimal.

Given this fact, staff believes that operational noise and vibration would not have a significant adverse effect on local wildlife. No impact avoidance, minimization, or mitigation measures are proposed beyond those conditions of certification proposed in the **NOISE** section of this Staff Assessment.

Operational Lighting

Lights on tall towers can result in collision (see **Avian Collision** below). San Joaquin kit foxes are primarily active at night and could be adversely affected by night lighting that attracts them into plant areas that can result in mortality or injury from plant activity or plant vehicles. This section discusses night lighting that would illuminate the ground, e.g., night lighting for human access and public safety. **Avian Collision** below discusses night lighting of tall structures. A2PP may require night lighting for security. As described in the AFC (TID 2009a, pg. 5.13-22), the project developer proposes to install lighting fixtures that include shields and hoods to minimize fugitive light. Low pressure sodium lamps and non-glare fixtures will be utilized. For areas where lighting is not required for normal operation, safety, or security, switched lighting circuits would be provided, allowing these areas to remain dark at most times. Refer to the **Visual** section of the Staff Assessment for specific lighting requirements.

Assessment of impacts of night lighting for ground-dwelling wildlife is based on the following biological considerations: 1) that the existing site is already degraded; 2) the project site does not provide essential habitat from which individuals would be excluded by operational lights; 3) that sensitive wildlife are not expected to occur near the project area; 4) that A2PP would occupy an existing plant site with existing night lighting; and 5) that affected wildlife would either habituate to any increase in lighting or would maintain their own comfortable distance. Given these existing conditions, staff believes that the impact of operational night lighting on ground-dwelling wildlife would be less than significant and no specific mitigation measures are proposed.

Avian Collision

Human structures that are significantly taller than the natural landscape pose a collision risk for birds in flight, especially on dark nights and in foggy or stormy weather with low cloud ceilings, especially if structures are lighted, and especially if the structures are tall, narrow, and difficult to detect, such as communication towers and guy wires. Lights on towers can be especially harmful because they can attract, disorient, or misorient flying birds, drawing them off course and confusing them. These effects are well documented (Rich and Longcore 2006). A2PP proposes new stacks that would be 80 feet in height (TID 2009a, Fig. 2.1-2). This is the tallest feature associated with the new project construction. Structures over 200 feet high create the largest hazard for avian collision, so the 80-foot tall stacks of the proposed A2PP are not considered to be a significant collision hazard. The A2PP is also not located near a large wetland or other land use that causes birds to flock in large groups. Therefore avian collision impacts with the A2PP are not expected to be significant.

Lighting will be present on the exhaust stacks (TID 2009a, pg. 5.13-24). Task lighting would be provided but it would only be used when work is being performed, which would not be expected to occur at night. The extent of lighting is expected to be similar

to that of the existing Almond power plant. Therefore, staff believes that avian collision risk would be less than significant.

Avian Electrocution

The existing 69-kV PG&E transmission lines and the two proposed 115-kV lines and towers may pose a risk of avian electrocution and collision. However, there is a low likelihood of electrocutions occurring at voltages greater than 60-kV because phase-to-phase and phase-to-ground clearances for lines greater than 60-kV are typically sufficient to prevent bird electrocution (APLIC 2006). Potential electrocution impacts would be mitigated by incorporating the construction design recommendations provided in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Specifically, transmission lines that have a minimum of 5.5 feet between conductor wires would minimize the potential for avian electrocution. This measure has been incorporated into staff's proposed Condition of Certification **BIO-7** to minimize the risk of avian mortality from electrocution. The applicant also has prepared an avian protection plan that is designed to avoid or minimize electrocution impacts to avian species from TID transmission lines (TID 2009a, Appendix 5.2E). This plan specifies transmission line designs to minimize or avoid potential impacts to perching raptors. With these measures avian electrocution risk would be less than significant.

Air Emissions

Certain plant species and communities are highly sensitive to air pollutants such as carbon monoxide (CO), oxides of sulfur (SO_x), and nitrogen oxides (NO_x). Some sensitive plants live in nitrogen-limited, low-biomass plant communities that may be rare, endemic, or declining in California. Nitrogen-limited plant communities include, among others, coastal sage scrub, serpentine grassland, desert scrub, vernal pools, and bogs and other wetland habitats. This competitive advantage could be lost when air pollution increases nitrogen deposition in that community. Increased nitrogen could then give a nonnative species a competitive advantage over a native species allowing it to take over. Impacts could extend to wildlife such as a butterfly that depends for survival on the native species that no longer has the competitive advantage (Weiss 1999).

Staff believes that air emissions would not represent a significant project effect to sensitive plants or plant communities. This is because the project would minimize air pollutant emissions using best-available control technology and would comply with applicable air-quality standards, and because there are no nitrogen-limited or otherwise sensitive vegetation communities near the project site. With applicant-proposed measures and staff's proposed conditions of certification in the **AIR QUALITY** section of this staff assessment, staff believes that air emissions of the A2PP would not significantly affect biological resources.

CUMULATIVE IMPACTS

Cumulative impacts refer to a proposed project's incremental effect viewed over time, together with other closely related past, present, and reasonably foreseeable future projects (Public Resources Code § 21083; California Code of Regulations, Title 14, §§ 15064[h], 15065[c], 15130, and 15355). 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 significant issues in the San Joaquin Valley. As mentioned previously, the San Joaquin Valley has experienced significant loss of habitat associated with conversion of natural vegetation communities to agriculture and the increase in population and subsequent expansion of urban areas. However, the A2PP site and its associated infrastructure are generally located in areas that have been previously disturbed or developed or are currently being utilized for agriculture or industrial development. As such, no loss of sensitive habitats or natural vegetation communities will occur with implementation of the A2PP project beyond what has already historically occurred. Vegetation within the gas pipeline shall be revegetated once construction is complete (TID 2009a), so no net loss of vegetation will occur with construction of the project. Staff concludes that with implementation of the applicant's proposed mitigation measures and compliance with staff's proposed conditions of certification, the A2PP will not result in significant cumulative impacts to special status species, their habitat, or other sensitive biological resources.

COMPLIANCE WITH LORS

This section is based on the laws, ordinances, regulations, and standards (LORS) provided in **Biological Resources Table 1** above. The proposed project must comply with state and federal laws, ordinances, regulations, and standards that address state and federally listed species, as well as other sensitive species and their habitats. The proposed project must comply with state and federal laws, ordinances, regulations, and standards (LORS) (see summary in **Biological Resources Table 2**) that address state and federally listed species, as well as other sensitive species and habitats, and must secure the appropriate permits to satisfy these LORS. The Energy Commission has a one-stop permitting process for all thermal power plants rated 50 MW or more under the Warren-Alquist Act (Pub. Resources Code § 25500). Under the Act, the Energy Commission's certificate is "in lieu of" other state, local, and regional permits (*Ibid*.), but not federal permits. A summary of the LORS expected to be necessary for the A2PP and the status of any permit applications is provided in **Biological Resources Table 3**.

Biological Resources Table 3
Permits/Consultations potentially Required

Permit	Status	Comment
State LORS		
A 2081 permit for impacts to giant garter snake, Swainson's hawk and San Joaquin kit fox may be required.	Not yet determined if 2081 will be required for these state-listed species.	If 2081 is required, conditions of 2081 permit will be included in the final BRMIMP.
A Streambed Alteration Agreement for canal crossings may be required.	Applicant is currently submitting SAA application to CDFG.	If SAA is required, conditions of SAA will be included in the final BRMIMP for those conditions not currently contained in **BIO-14**.
Federal LORS		
Section 7 Consultation under the federal endangered species act may be required for project-related impacts to giant garter snake, fairy shrimp species, and possibly San Joaquin kit fox.	The project applicant has informally consulted with USFWS.	It is assumed that the project will require a 404 permit with ACOE (see below). During review of the 404 permit application, it is assumed that ACOE will consult with USFWS regarding potential

		project-related impacts to the federally listed giant garter snake, fairy shrimp species, and San Joaquin kit fox. Assuming a 404 permit is required and if potential take is determined for any federal listed species, conditions for mitigation of take will be issued in the biological opinion for the project. If a 404 permit is not required by the project and the USFWS finds the possibility of take, then a habitat conservation plan will be required to be prepared through Section 10 of the federal endangered species act for potential take of federally listed species.
Clean Water Act 404 permit through the ACOE.	The project applicant is currently preparing a wetland delineation for submittal to ACOE.	If waters of the U.S. will be impacted by the proposed project, then the appropriate 404 permit will be applied for and issued. Conditions of the 404 permit will be incorporated into the final BRMIMP.

Construction and operation of the A2PP would take place entirely within areas previously disturbed for the existing Almond I power plant or with construction associated with the WinCo Distribution Center. The associated natural gas pipeline and transmission lines do have limited potential to impact special-status biological resources in the region. However, staff's conditions of certification bring the pipeline and transmission lines into compliance with all applicable regulations. As mentioned previously, the applicant may need additional permits for impacts to jurisdictional waters and incidental take permits associated with potential impacts to state and federal-listed species. The terms and conditions of any required permits will be required to be incorporated into the final BRMIMP in order for the applicant to be in full compliance with state and federal LORS.

NOTEWORTHY PUBLIC BENEFITS

There are no noteworthy public benefits associated with the A2PP project as it relates to biological resources. However, it should be noted that the A2PP and its associated infrastructure have been located in a brownfield or in active agricultural or disturbed areas that minimize or avoid potential impacts to special-status plant and wildlife species that could potentially occur in the vicinity.

CONCLUSIONS

The following section summarizes the potential impacts to biological resources associated with construction and operation of the A2PP site.

Overview of Impacts to Vegetation/Wildlife: The A2PP and its associated infrastructure will not have a significant impact on sensitive vegetation communities because none are present within the designated impact area. Impacts to local wildlife species are expected to be fully mitigated with the incorporation of staff's conditions of certification and applicant's proposed mitigation measures.

Take of Listed Species: The federal and state-listed San Joaquin kit fox and giant garter snake could potentially occur within the designated impact area. The preferred pipeline alignment also crosses one ponded area that provides marginal habitat for federally listed fairy shrimp species such as Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp. The state-listed Swainson's hawk could nest in proximity to the preferred gas pipeline alignment. However, there will be no permanent loss of suitable habitat for these species from construction of the A2PP with the exception of possible fairy shrimp habitat within the gas pipeline alignment. Pre-construction surveys for these species shall be conducted to determine their presence or absence within designated work areas. Potential impacts to these species during construction will be fully mitigated to a less than significant level with the incorporation of staff's conditions of certification. The wildlife agencies may require the issuance of incidental take permits for project-related impacts to state or federal-listed species. The conditions of any necessary take permits will have to be included in the final BRMIMP (see **Biological Resources Table 3**).

Migratory Birds/Burrowing Mammals: Migratory birds and burrowing mammals have the potential to be directly impacted during construction of the natural gas pipeline and transmission line corridors. However, there will be no permanent loss of suitable habitat for these species from construction of these linear elements. Potential impacts to these species during construction will be fully mitigated to a less than significant level with the incorporation of staff's conditions of certification.

Special Status Plants: Special status plants are not known to occur within the designated impact area for the A2PP. A follow-up survey is scheduled for the spring of 2010. If special status plants are found during the follow-up survey, mitigation measures would be incorporated to avoid or mitigate for these impacts in the Staff Assessment Addendum. If no special-status plant species are found during 2010 surveys then impacts to special-status plant species are expected to be less than significant.

Impacts to CDFG Jurisdictional State Waters and Waters of the U. S.: The extent of jurisdictional state waters and waters of the U.S. is currently unknown. It is currently assumed that Harding Drain and Prairie Flower Drain are subject to ACOE and CDFG jurisdiction. If it is determined after review of the applicant's wetland delineation that jurisdictional features cannot be avoided during project construction, then mitigation contained within the required permit(s) shall be incorporated into the final BRMIMP. If no jurisdictional features are present within the project footprint, then impacts to jurisdictional waters will be less than significant. Any impacts to jurisdictional waters are expected to be temporary and less than significant since the applicant shall be drilling under any jurisdictional features, thus avoiding direct impacts to these features and features will be restored to pre-project conditions.

PROPOSED CONDITIONS OF CERTIFICATION

The applicant has proposed several mitigation measures to reduce potential impacts to biological resources (TID 2009a). The applicant proposed mitigation measures generally follow prescribed agency guidelines for construction projects that may impact giant garter snake (GGS), western pond turtle, western burrowing owl, Swainson's hawk, or San Joaquin kit fox. Where applicable, staff has incorporated those measures into the following proposed biological resources conditions of certification for the A2PP.

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign a Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) for approval. The Designated Biologist must have the following minimum qualifications: a bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field; three years of experience in field biology or current certification of a nationally recognized biological society, such as the Ecological Society of America or The Wildlife Society; and at least one year of field experience with biological resources found in or near the project area.

Verification: The project owner shall submit the specified information at least 90 days prior to the start of any site mobilization. No site or site-related activities shall commence until an approved Designated Biologist is available to be on site. If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by approved biological monitors, but remains the contact for the project owner, the CPM, CDFG, and USFWS. The Designated Biologist shall:

- advise the project owner's construction/operation managers on the implementation of biological resource conditions of certification;
- consult on the preparation of the Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP), to be submitted by the project owner;
- report sensitive species sightings to CNDDB where appropriate
- be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resource compliance efforts, particularly in areas

requiring avoidance or containing sensitive biological resources such as special-status species or their habitats;

- clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
- inspect active construction areas where animals may have become trapped prior to commencement of construction each day;
- inspect for installation of structures that prevent entrapment or allow escape during periods of construction inactivity at the end of each day;
- periodically inspect areas with high vehicle activity (i.e., parking lots) for animals in harm's way;
- notify the project owner and CPM of any noncompliance with any biological resource condition of certification;
- respond directly to inquiries of the CPM regarding biological resource issues;
- maintain written records of the tasks specified above and those included in the biological resources mitigation implementation and monitoring plan (BRMIMP), with summaries of these records submitted in the monthly compliance report and the annual report; and
- train the biological monitors as necessary, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP), and all biological resource-related permits.

Verification: The Designated Biologist shall submit a monthly compliance report to the CPM during project construction that includes copies of all written reports and summaries that document biological resource activities. If actions may affect biological resources during operation, a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the annual compliance report unless their duties are ceased as approved by the CPM. The Designated Biologist shall notify the CPM, CDFG, and USFWS of any project-related take of state or federally listed species within 24 hours.

BIOLOGICAL MONITOR SELECTION

BIO-3 The project owner's CPM-approved Designated Biologist shall submit the resume, at least three references, and contact information for the proposed biological monitors to the CPM for approval. The resume shall demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the assigned duties. Biological monitor training by the Designated Biologist shall include familiarity with the conditions of certification and the BRMIMP, WEAP, and all permits.

Verification: The project owner shall submit the specified information to the CPM for approval at least 30 days prior to the start of any site mobilization. The Designated Biologist shall submit a written statement to the CPM confirming that individual biological monitors have been trained, including the date when training was completed. If additional biological monitors are needed during construction, the specified

information shall be submitted to the CPM for approval 10 days prior to their first day of monitoring activities.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-4 The project owner's construction/operation managers shall act on the advice of the Designated Biologist and Biological Monitors to ensure conformance with the biological resources conditions of certification. If required by the Designated Biologist and Biological Monitors, the project owner's construction/operation managers shall halt site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

- require a halt to all activities in any area when there would be an unauthorized adverse impact to biological resources if the activities continued;
- inform the project owner and the construction/operation managers when to resume activities;
- notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or shall be instituted, as a result of the work stoppage; and
- if the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any noncompliance 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 shall be made by the CPM within 5 working days after receipt of notice that corrective action is completed, or the project owner shall 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 including fairy shrimp, giant garter snake, western pond turtle, western burrowing owl, Swainson's hawk, San Joaquin kit fox, and American badger. The WEAP must:

- be developed by or in consultation with the Designated Biologist and consist of an onsite or training center presentation in which supporting

written material and electronic media are made available to all participants;

- discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
- present the reasons for protecting these resources;
- present the meaning of various temporary and permanent habitat protection measures;
- identify whom to contact if there are further comments and questions about the material discussed in the program;
- include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines; and
- be administered by a competent individual acceptable to the Designated Biologist.

Verification: At least 60 days prior to the start of any site mobilization, the project owner shall provide to the CPM two copies of the proposed WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the persons administering the program. The project owner shall provide in the monthly compliance report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to site mobilization, the project owner shall submit two copies of the CPM-approved training materials to the CPM. The signed training acknowledgement forms from construction shall be kept on file by the project owner for a period of at least 6 months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for 6 months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-6 The project owner shall submit two copies of the proposed biological resources mitigation implementation and monitoring plan (BRMIMP) to the CPM for review and approval, USFWS, and CDFG for review and comment, and shall implement the measures identified in the approved BRMIMP. The BRMIMP shall be prepared in consultation with the Designated Biologist, shall include all measures contained in the BRMIMP for the A2PP project, and shall identify:

- all applicant-proposed mitigation, monitoring, and compliance measures included as part of the project description in the AFC, which include all measures required for A2PP construction and operation;
- all biological resource conditions of certification, including any measures or conditions provided in required permits;
- all biological resource mitigation, monitoring, and compliance measures required in terms and conditions of federal agencies permitting the project;

- all mitigation, monitoring, and compliance measures required for protection of fairy shrimp, giant garter snakes, San Joaquin kit foxes, burrowing owls, Swainson's hawks and other nesting raptors as discussed in conditions of certification below;
- a detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
- all locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;
- duration for each type of monitoring and a description of monitoring methodologies and frequency;
- performance standards to be used to help decide if and when proposed mitigation is or is not successful;
- all performance standards and remedial measures to be implemented if performance standards are not met;
- a process for proposing plan modifications to the CPM and appropriate agencies for review and approval;
- a copy of all biological resource-related permits obtained; and
- a description of impact avoidance, minimization, and mitigation measures for noise, fugitive dust, and lighting impacts.

Verification: The project owner shall provide the draft BRMIMP at least 60 days prior to start of any site mobilization. The CPM (and USFWS, and CDFG if they choose to comment), shall determine the BRMIMP acceptability within 45 days of receipt. If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM and the City of Ceres within 5 days of their receipt and the BRMIMP shall be revised or supplemented to reflect the permit conditions within 10 days of their receipt by the project owner. Ten days prior to mobilization of the site and related facilities, the revised BRMIMP shall be resubmitted to the CPM.

The project owner shall notify the CPM no less than 5 working days before implementing any modifications to the approved BRMIMP to obtain CPM approval. Any changes to the approved BRMIMP must also be approved by the CPM and submitted to the USFWS and CDFG to ensure that no conflicts exist.

Implementation of BRMIMP measures shall be reported in the monthly compliance reports by the Designated Biologist (i.e., survey results, construction activities that were monitored, species observed). Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction closure report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding.

IMPACT AVOIDANCE MITIGATION MEASURES

BIO-7 The project design shall incorporate all feasible measures that avoid or minimize impacts to the local biological resources, including the following:

- design, install, and maintain transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources;
- design, install, and maintain new and reconductored transmission lines and all electrical components in accordance with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) to reduce the likelihood of electrocutions of large birds;
- eliminate from landscaping plans any List A California exotic pest plants of concern as defined by the California Exotic Pest Plant Council;
- no firearms shall be allowed on the site;
- no dogs or other household pets shall be allowed in work areas; and
- prescribe a road sealant that is nontoxic to wildlife and plants that will limit dust on dirt roads.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how impact avoidance measures were completed.

FRAC-OUT CONTAINMENT PLAN

BIO-8 The project applicant shall prepare and implement a frac-out containment plan to ensure that drilling mud or other drilling material do not impact biological resources or impair water quality of canals during gas pipeline construction. The plan should include measures to protect water quality of the adjacent canal(s) and any vegetation that provides suitable habitat for special-status wildlife species adjacent to the frac-out. The plan should also include appropriate procedures for cleanup and disposal of drilling materials and contain potential mitigation measures for impacts to sensitive plant and wildlife species or their habitat that may occur as the result of a frac-out.

Verification: A draft containment plan must be submitted to the CPM, USFWS, and CDFG no less than 60 days before the estimated start of construction. A final plan must be completed no less than 30 days before the start of the construction. The final plan shall be incorporated into the BRMIMP. Notification of any frac-out must be made to the CPM, USFWS, and CDFG within 24 hours of the occurrence. The project owner shall notify the CPM of the circumstances and location of the frac-out and corrective measures that are being taken. Whenever corrective action is taken by the project owner, a determination of success or failure shall be made by the CPM within 5 working days after receipt of notice that corrective action is completed, or the project owner shall be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

AVOID HARASSMENT OR HARM TO SAN JOAQUIN KIT FOXES

BIO-9 The project owner shall conduct a pre-construction survey for San Joaquin kit fox for the construction impact area, transmission lines, pipeline corridor, or reconductoring areas and a 200-foot buffer of the gas pipeline alignment and the transmission line corridors. If a natal or pupping den is found within a designated construction area or within 200 feet of a designated construction area, USFWS and CDFG shall be contacted regarding the location of the den and whether any impacts are anticipated to the den from construction activities. If a take permit was not previously issued for the A2PP project, the project applicant shall coordinate with the CDFG and USFWS to determine if a take permit will be required for project construction. A copy of all conditions of the take permit shall be included in the BRMIMP and a revised BRMIMP shall be prepared for the project as required. After consultation with USFWS and CDFG, potential dens may require a 50-foot exclusion zone and active dens may require a 100-foot exclusion zone. Destruction of any known dens would require a take permit from USFWS and the Energy Commission. Natal dens shall not be collapsed until after the adults and pups have left the den.

The project owner shall manage the construction site and related linear alignments for the transmission lines and gas pipeline in a manner to avoid or minimize impacts to the San Joaquin kit fox by following the USFWS 1999 guidelines entitled *Standardized* Recommendations *for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 1998). Measures provided by USFWS include but are not limited to the following. During construction, all pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at the construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before using or moving the equipment or materials. If a kit fox is discovered, then the materials or equipment shall not be moved until consultation with the USFWS and CDFG. If necessary, under the direct supervision of the Designated Biologist, the equipment may be moved once to remove it from the path of construction activity until the fox escapes.

All excavated, steep-walled holes or trenches more than 2 feet deep shall be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals by the Designated Biologist.

During construction, all food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in closed containers and removed at least once a week from the construction site.

During construction, the Designated Biologist shall notify the USFWS and CDFG within 24 hours of receiving a report of incidental take occurring at the project site. The project proponent and the permitting agencies shall meet within two weeks to discuss adaptive management measures that may be undertaken to reduce or eliminate future incidents of incidental take.

Verification: The pre-construction survey shall be conducted no less than 14 days and no more than 30 days prior to the initiation of construction on the gas pipeline or transmission corridors. A written report summarizing the results of the pre-construction survey shall be sent to the CPM and USFWS prior to the start of ground disturbance. All incidental take minimization measures related to San Joaquin kit fox shall be included in the BRMIMP. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, USFWS, and CDFG, for review and approval, a written construction termination report identifying how all biological resource-related conservation measures were completed.

PRE-CONSTRUCTION NESTING BIRD SURVEYS AND NEST MONITORING

BIO-10 Where practicable, ground-disturbance activities shall be conducted outside the bird nesting season (February 1 through July 31) except within 200 feet of potential giant garter snake habitat as described in **BIO-13**. Pre-construction nest surveys shall be conducted if construction activities would occur between February 1 and July 31. The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:

Surveys shall be performed within all potential nesting habitat in the project disturbance area (including the gas pipeline and transmission corridors). A survey buffer of 500 feet shall be included in the survey area. Surveys specifically for nesting Swainson's hawks shall be conducted within ½ mile of designated disturbance areas that contain appropriate nesting habitat;

If active nests are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFG) shall be established and a nest monitoring plan shall be developed for all active nests. Active nests shall be monitored on a weekly basis until such time that the Designated Biologist determines the nestlings have fledged and disbursed or the nest is otherwise no longer active. Activities that might, in the opinion of the Designated Biologist, disturb nesting activities, shall be prohibited within the buffer zone until such a determination is made. Consultation with CDFG shall be required for any construction that occurs within ½ mile of an active Swainson's hawk nest to ensure that no take of Swainson's hawks occurs during project construction.

Nest locations shall be mapped using a geographic positioning system (GPS) and submitted, along with a summary report describing the survey results, to the CPM. The Designated Biologist shall monitor the nest as prescribed above until he or she determines that nestlings have fledged and dispersed or the nest is otherwise no longer active (abandoned).

Verification: At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. One of the surveys shall be conducted within the 14-day period immediately preceding initiation of construction. The other survey should be conducted during the start of the Swainson's hawk breeding season (March 20th to April

20th) prior to construction to accurately determine the location of Swainson's hawk nests within ½ mile of construction areas. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks, an interval during which birds may establish a nesting territory and initiate egg laying and incubation. At least 10 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM and CDFG a letter-report describing the findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor (s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest.

BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-11 The project owner shall manage the pipeline alignment and transmission lines in a manner to avoid or minimize impacts to the burrowing owl following California Burrowing Owl Consortium Mitigation Guidelines (CBOC 1999).

During the nonbreeding season (September 1 through January 31), burrowing owls found during pre-construction surveys (**BIO-10**) to be within 50 meters of designated construction areas shall be evicted by passive relocation as described in the California Department of Fish and Game *Staff Report on Burrowing Owls* (CDFG 1995).

During the breeding season (February 1 through August 31), occupied burrows in designated construction areas or within 75 meters of designated construction areas shall not be disturbed and shall be provided with a 75-meter protective buffer until the Designated Biologist verifies through noninvasive means that either the birds have not begun egg laying or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Once fledglings are capable of independent survival, the owls can be evicted as described in item 1 of this condition and the burrow can be destroyed.

Verification: The project owner shall submit a report to CDFG and the CPM at least 10 days prior to the start of site mobilization that describes survey methods, results, and conservation or mitigation measures implemented in respect to burrowing owls. This report should be submitted in conjunction with **BIO-10**. If owl relocation is necessary, the project owner or the Designated Biologist shall coordinate with CDFG on the number of new burrows required (if any), their locations, and how any created burrows and compensation land shall be protected for the life of the project in a burrowing owl mitigation and monitoring plan. Within 30 days after completion of owl relocation and monitoring and the start of ground disturbance, the project owner shall provide written verification to the CDFG and CPM that burrowing owl mitigation measures have been completed.

GIANT GARTER SNAKE (GGS) AND WESTERN POND TURTLE PRE-CONSTRUCTION CLEARANCE SURVEYS

This condition assumes that the ACOE shall enter formal consultation regarding potential project-related impacts to GGS with USFWS during the process of the ACOE's issuance of a Section 404 permit. If a 404 permit is not required by the ACOE upon review of the wetland delineation for the project, then the language of this condition is subject to change.

BIO-12 The project owner shall conduct pre-construction surveys for GGS and western pond turtle (WPT) for all gas pipeline construction areas within 200 feet of a canal crossing that provides suitable habitat for GGS or WPT as specified in the GGS habitat assessment prepared by the applicant (CH2MHILL 2009k).

Verification: The Designated Biologist or a representative approved by USFWS and the CPM must survey the construction area within potential GGS and WPT habitat (including both aquatic habitat and upland habitat within 200 feet of suitable aquatic habitat) no more than 24 hours prior to the initiation of construction. Another pre-construction survey must be conducted if construction activity ceases within potential GGS habitat for a period of more than 2 weeks. The project owner shall submit a report to the CPM, USFWS, and CDFG no more than 10 days after completion of GGS and WPT pre-construction surveys that describes survey methods, results, and conservation or mitigation measures taken. A figure shall be prepared for any sightings of GGS or WPT.

GIANT GARTER SNAKE (GGS) IMPACT AVOIDANCE AND MINIMIZATION MEASURES

This condition assumes that the ACOE shall enter formal consultation regarding potential project-related impacts to GGS with USFWS during the process of the ACOE's issuance of a Section 404 permit. If a 404 permit is not required by the ACOE upon review of the wetland delineation for the project, then the language of this condition is subject to change.

BIO-13 Construction within 200 feet of canals with suitable GGS habitat must follow USFWS construction guidelines. The project applicant shall minimize all gas pipeline construction within 200 feet of canals with suitable GGS habitat to the greatest extent possible. All construction that must occur within 200 feet of canals with potential GGS habitat shall occur within the GGS active period (May 1-October 1). USFWS must approve in writing any construction work within GGS habitat that must be conducted outside of this time window before construction activities commence. All pipeline construction within GGS areas shall incorporate measures as described in the USFWS GGS construction guidelines including but not limited to the following;

Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions. Restoration work may include such activities as replanting species removed from banks during construction or drilling operations.

No fencing or other materials shall be utilized within 200 feet of GGS habitat that could potentially entangle or otherwise harm GGS.

Verification: The project owner shall submit a report to USFWS and the CPM if any GGS are found within work areas no more than 24 hours after the sighting is made. The report shall include monitoring results; a description of resolution of construction/snake conflict, and any additional monitoring that was required. The monthly monitoring report shall include updates on construction work occurring within GGS habitat.

COMPLIANCE WITH CDFG STREAMBED ALTERATION AGREEMENT (SAA) AND ACOE SECTION 404 PERMIT MEASURES

This condition is subject to change once the applicant determines the extent of federal and state jurisdictional features present within the project footprint and the extent of project-related impacts to these features. Conditions **BIO-12** and **BIO-13** are contingent on the applicant acquiring a Section 404 permit and operating under the ACOE's programmatic permit for GGS with projects requiring a 404 permit.

BIO-14 The applicant is currently preparing a wetland delineation report to be submitted to CDFG and the ACOE to determine if state waters or waters of the U.S. are present within the disturbance areas or within the natural gas pipeline ROW or the transmission line corridors. It is currently assumed that an SAA and Section 404 Nationwide Permit shall be required by the project for Harding Drain and Prairie Flower Drain. The following measures shall be implemented:

1. Acquire appropriate 404 permit through the ACOE.

2. Any conditions of the SAA not currently included in this Condition of Certification **BIO-14** that are required by CDFG shall be included in the final BRMIMP.

3. Right of Access and Review for Compliance Monitoring: The CPM reserves the right to enter the project site or allow CDFG or ACOE to enter the project site at any time to ensure compliance with these conditions. The project owner herein grants to the CPM and to CDFG and/or ACOE employees and/or their representatives the right to enter the project site at any time to ensure compliance with the terms and conditions and/or to determine the impacts of storm events, maintenance activities, or other actions that might affect the jurisdictional waters. The CPM, ACOE, or CDFG may, at their discretion, review relevant documents maintained by the operator, interview the operator's employees and agents, inspect the work site, and take other actions to assess compliance with or effectiveness of mitigation measures.

4. Notification: The project owner shall notify the CPM, ACOE, and CDFG, in writing at least five days prior to initiation of project activities in jurisdictional areas as noted and at least five days prior to completion of construction activities in jurisdictional areas. The project owner shall notify the CPM and CDFG of any change of conditions to the project, the jurisdictional impacts, or the mitigation efforts, if the conditions at the site of a proposed project change in a manner which changes risk to biological resources that may be substantially adversely affected by the proposed project. The notifying report shall be provided to the CPM, ACOE, and CDFG no later than seven days after the change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project as defined below. A copy of the notifying change of conditions report shall be included in the annual reports**.**

   a. Biological Conditions: a change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the project area whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

   b. Physical Conditions: a change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.

   c. Legal Conditions: a change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of Title 14 of the California Code of Regulations.

5. Code of Regulations: The project owner shall provide a copy of the Streambed Impact Minimization and Compensation Measures from the Energy Commission Decision to all contractors, subcontractors, and the applicant's project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFG personnel or Energy Commission personnel upon demand. The CPM reserves the right to issue a stop work order or allow CDFG to issue a stop work order after giving notice to the project owner if the CPM in consultation with CDFG, determines that the project owner has

breached any of the terms or conditions or for other reasons, including but not limited to the following:

a. The information provided by the applicant regarding streambed alteration is incomplete or inaccurate;

b. New information becomes available that was not known to it in preparing the terms and conditions;

c. The project or project activities as described in the Staff Assessment Addendum have changed; or

d. The conditions affecting biological resources changed or the CPM, in consultation with CDFG and ACOE, determines that project activities will result in a substantial adverse effect on the environment.

6. Best Management Practices: The project owner shall also comply with the following conditions:

a. The project owner shall minimize road building, construction activities and vegetation clearing within state waters and waters of the U.S. to the extent feasible.

b. The project owner shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter jurisdictional waters or be placed in locations that may be subjected to high storm flows.

c. The project owner shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the project owner to ensure compliance.

d. Spoil sites shall not be located within drainages or locations that may be subjected to high storm flows, where spoil shall be washed back into a drainage.

e. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering jurisdictional waters. These materials, placed within or where they may enter a jurisdictional drainage by project owner or any party working under contract or with the permission of the project owner shall be removed immediately.

f. No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, jurisdictional waters.

g. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 200 feet of the high water mark of any drainage.

h. No equipment maintenance shall occur within 200 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.

Verification: The project owner shall obtain all required permits from ACOE and/or the Energy Commission in conjunction with CDFG at least 30 days prior to the start of construction. The project owner shall incorporate all required conditions of the SAA and/or 401/404 permit(s), as applicable, into the final BRMIMP at least 30 days prior to the start of site mobilization. A copy of all issued permits shall be sent to the CPM at least 30 days prior to the start of construction activities.

FAIRY SHRIMP SURVEYS OR AVOIDANCE AND COMPENSATORY MITIGATION

This condition assumes that the ACOE will enter formal consultation regarding potential project-related impacts to federally listed fairy shrimp with USFWS during the process of ACOE's issuance of a Section 404 permit. If a 404 permit is not required by the ACOE upon review of the wetland delineation for the project, then the language of this condition is subject to change.

BIO-15 The applicant shall either conduct focused protocol fairy shrimp surveys (1 dry season and 1 wet season survey) or assume presence of fairy shrimp in all suitable habitats within 250 feet of the edge of impact of the preferred pipeline alignment. If the applicant conducts focused surveys which are negative and are accepted by USFWS, then no further mitigation is necessary. If the applicant finds evidence of fairy shrimp within suitable habitat or assumes presence of fairy shrimp and the project cannot avoid occupied habitat by at least 250 feet, then compensatory mitigation shall be required as specified by USFWS in their biological opinion for the project. Compensatory mitigation will include acquisition and protection in perpetuity of occupied fairy shrimp habitat at an acreage specified by USFWS or purchase of vernal pool credits at an appropriate mitigation bank as required by USFWS in the biological opinion. The final requirements for fairy shrimp mitigation as specified in the biological opinion shall be included in the final BRMIMP.

Verification: If the project owner conducts focused surveys for fairy shrimp, the results of focused surveys shall be submitted to the CPM and USFWS no more than 45 days after completion of the surveys. If the project owner finds fairy shrimp during focused surveys or assumes presence, a final mitigation proposal based on the biological opinion for the project shall be sent to the CPM no more than 30 days prior to the implementation of pipeline construction.

SPECIAL STATUS PLANT MITIGATION

The mitigation portion of this condition would only be necessary if special status plant species are found during focused surveys conducted in the spring of 2010 along the preferred gas pipeline alignment.

BIO-16 The applicant shall conduct focused surveys for potentially occurring special status plant species within the preferred gas pipeline ROW in the spring of

2010. If special status plant species are not found during focused surveys, then no further mitigation is required. If special status plant species are found within the impact area of the preferred pipeline alignment and cannot be avoided during pipeline construction to the satisfaction of the CPM and CDFG, then the applicant shall prepare a special status plant mitigation plan for approval by the CPM and CDFG. The plan shall include appropriate mitigation measures to fully mitigate all impacts to special status plant species. Mitigation measures may include plant salvage and transplantation, seed collection and replanting, or purchase of appropriate mitigation credits or mitigation land. Appropriate mitigation measures shall depend on the species that is impacted and the degree of impact.

Verification: The results of the special status plant survey shall be reported to the CPM and CDFG within 60 days of completion of the survey. If the findings of the survey determine that preparation of a special status plant mitigation plan is necessary, then a draft mitigation plan shall be submitted to the CPM and CDFG no less than 90 days prior to the initiation of pipeline construction. A final mitigation plan shall be prepared no less than 30 days prior to the start of pipeline construction. The conditions of the special status plant mitigation plan shall be included in the final BRMIMP.

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CULTURAL RESOURCES

Testimony of Kathleen Forrest and Michael D. McGuirt

SUMMARY OF CONCLUSIONS

Staff concludes that the Almond 2 Power Plant (A2PP) project, proposed by the Turlock Irrigation District (the applicant), would have a less than significant impact on known and newly identified built-environment and archaeological resources, so no mitigation for project impacts would be required. The adoption and implementation of Conditions of Certification **CUL-1** through **CUL-8** would reduce the potential impacts of the proposed project on potential archaeological resources discovered during construction-related excavation activities to less than significant.

Staff recommends that the Commission adopt the following cultural resources Conditions of Certification, **CUL-1** through **CUL-8**. These measures are intended to complete the post-certification identification of subsurface archaeological deposits through a geoarchaeological study, to facilitate the identification and assessment of previously unidentified archaeological resources encountered during construction, and to mitigate any significant impacts from the project on any newly found resources assessed as significant. To accomplish this, the conditions provide for the hiring of a qualified geoarchaeologist who would complete a pre-construction geoarchaeological study and report the results to the California Energy Commission Compliance Project Manager (CPM); for the hiring of a Cultural Resources Specialist and archaeological monitors; for cultural resources awareness training for construction workers; for the monitoring of construction-related, ground-disturbing activities by a Cultural Resources Specialist and archaeological monitors in accordance with the results of the geoarchaeological study; for the recovery of data from significant discovered archaeological deposits; for the writing of a technical archaeological report on all archaeological activities and results; and for the curation of recovered artifacts and other data. When properly implemented and enforced, staff believes that these conditions of certification would reduce to less than significant any impacts to previously unidentified, CRHR-eligible cultural resources encountered during construction or operation. Additionally, with the adoption and implementation of these conditions, the A2PP would be in conformity with all applicable laws, ordinances, regulations, and standards (LORS).

INTRODUCTION

This cultural resources assessment identifies the potential impacts of the A2PP project on cultural resources. Cultural resources are defined under state law as buildings, sites, structures, objects, and historic districts. Three kinds of cultural resources, classified by their origins, are considered in this assessment: prehistoric, ethnographic, and historic.

Prehistoric archaeological resources are associated with the human occupation and use of California prior to prolonged European contact. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American

human behavior. In California, the prehistoric period began over 12,000 years ago and extended through the eighteenth century until 1769, when the first Europeans settled in California.

Ethnographic resources represent the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, Latino, or Asian immigrants. They may include traditional resource-collecting areas, ceremonial sites, value-imbued landscape features, cemeteries, shrines, or ethnic neighborhoods and structures.

Historic-period resources, both archaeological and architectural, are associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Groupings of historic-period resources are also recognized as historic districts and as historic vernacular landscapes. Under federal and state historic preservation law, cultural resources must be at least 50 years old to have sufficient historical importance to merit consideration of eligibility for listing in the California Register of Historical Resources (CRHR). A resource less than 50 years of age must be of exceptional historical importance to be considered for listing.

For the A2PP project, staff provides an overview of the environmental setting and history of the project area, an inventory of the cultural resources identified in the project vicinity, and an analysis of the project's potential impacts to significant cultural resources, using criteria from the California Environmental Quality Act (CEQA).

If cultural resources are identified, staff determines which are historically significant (defined as eligible for the CRHR) and whether the A2PP would have a significant impact on those that are CRHR eligible. Staff's primary concern is to ensure that all potentially CRHR-eligible cultural resources are identified, that all potential A2PP impacts to those resources are identified and assessed, and that conditions are proposed that ensure that all significant impacts that cannot be avoided are mitigated to a less-than-significant level.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Projects licensed by the Energy Commission are reviewed to ensure compliance with all applicable laws. For this project, in which there is no federal involvement,[1] the applicable laws are primarily state laws. Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies.

[1] Cultural resources in California are also protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 431, et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act.

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

Applicable Law	Description
State	
Public Resources Code 5097.98(b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until he/she confers with the Native American Heritage Commission-identified Most Likely Descendents (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.
California Health and Safety Code, Section 7050.5	This code makes it a misdemeanor to disturb or remove human remains found outside a cemetery. This code also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.
Local	
County of Stanislaus General Plan (County of Stanislaus 1994)	Conservation/Open Space Element, Goal Eight: Preserve areas of national, state, regional and local historical importance. Policies: The County will support the preservation of Stanislaus County's cultural legacy of historical and archaeological resources for future generations. "Qualified Historical Buildings" as defined by the State Building Code shall be preserved.
City of Ceres General Plan (City of Ceres 1997)	Recreational and Cultural Resources, Goal 5.B: To preserve and maintain sites, structures, and landscapes that serve as significant, visible reminders of the city's social, architectural, and agricultural history. Policies: • The City shall assist property owners in seeking registration of historic structures and sites as State Historic Landmarks or listing on the National Register of Historic Places. • The City shall encourage the preservation, maintenance, and adaptive reuse of existing historic buildings in the Redevelopment Areas and other areas of the Planning Area in order to prevent demolition and disrepair. • The City shall encourage the preservation of buildings of local historic importance in the Downtown and surrounding areas. • The City shall encourage relocation of reusable historic buildings as a means of historic preservation. • The City shall continue to implement the Historic Building Code for historic properties. Recreational and Cultural Resources, Goal 5.C: To protect Ceres' Native American heritage. Policies: • The City shall refer development proposals that may adversely affect archaeological sites to the California Archaeological Inventory at California State University, Stanislaus. • The City shall not knowingly approve any public or private project that may adversely affect an archaeological site without first consulting the California Archaeological Inventory, conducting a site evaluation as may be indicated, and attempting to mitigate any adverse impacts according to the recommendations of a qualified archaeologist. City implementations of this policy shall be guided by Appendix K of the *CEQA Guidelines*.

SETTING

Information provided regarding the setting of the proposed project places it in its geographical and geological context and specifies the technical description of the project. Additionally, the prehistoric, ethnographic, and historical background provides the context for the evaluation of the CRHR eligibility of any identified cultural resources within staff's area of analysis for this project.

REGIONAL SETTING

The proposed A2PP would be located in Ceres, Stanislaus County, California, on a 4.6-acre parcel adjacent to the existing Turlock Irrigation District (TID) Almond Power Plant, approximately 2 miles southwest of the center of Ceres. Ceres is located five miles south of Modesto, California, and primary access to the site would be via Crowes Landing Road off Highway 99. The proposed A2PP site was used as a borrow pit during the construction of the adjacent WinCo distribution center, and was backfilled with commercially available fill and graded in 2008 (TID 2009a, p. 2-1).

PROJECT, SITE, AND VICINITY DESCRIPTION

The proposed project would be a simple-cycle, natural gas fired power plant on 4.6 acres of land immediately north of the existing TID Almond Power Plant. The project would consist of three 58-megawatt (MW) turbines with an expected nominal output of 174 MW. The proposed project would also include a new 11.6-mile natural gas line; reinforcement of a 1.8-mile segment of an existing natural gas line; two new 115-kV transmission lines; and the reconductoring of an existing 69-kV, 2.9-mile transmission line. The two new transmission lines would extend south of the proposed project site to the proposed Grayson Substation. An additional 1.85-acre parcel would be used for construction and laydown areas, and a new storm water retention pond would be shared between the two facilities. The proposed plant would tie into the existing water supply and return used by the existing plant from the City of Ceres Wastewater Treatment Plant (TID 2009a, p. 5.3-2).

The proposed site is north of the existing Almond Power Plant, east of the WinCo distribution warehouse, south of a farm supply facility, and west of a modular building distributor. The site is relatively flat, and the proposed project site was previously excavated to a depth of 6.5 feet below the current grade and backfilled with material from the excavation of a wastewater pond in Turlock (TID 2009a, pp. 5.4-1–5.4-2). A storm water basin related to the WinCo distribution center is north of and adjacent to the site. Overall land use in the area is industrial and agricultural (CH2MHILL 2009k, App. F, p. 1-1).

The proposed 11.6 mile natural gas pipeline is identified as the preferred route. At the time the Application For Certification (AFC) was submitted, PG&E had not identified the preferred alignment for the proposed natural gas line, and the AFC initially included two possible routes. PG&E subsequently proposed the "preferred alignment," which would be located east of the initial proposed routes, and the applicant submitted this change as part of Data Response 1D. The preferred alignment would run south from the proposed project site along paved roads, unpaved farm roads and property lines. It

would tie in with PG&E Line #215 in Bradbury Road. A segment of Line #215 along Prune Avenue on the west side of the San Joaquin River would be reinforced as part of the project (CH2MHILL 2009k, app. F, p. 1-1). The proposed pipeline route would cross several historic water conveyance features (canals) within the TID. Construction of the proposed pipeline would be open trench, and would use a trenchless construction method to cross under the TID laterals (canal branches) and drains and the Union Pacific Railroad tracks. The pipeline would be buried approximately four feet below grade. The trench would be approximately 4 feet wide and 6–8 feet deep (CH2MHILL 2009k, p. 2-2).

For increased reliability, the two proposed, new, pole-mounted transmission lines, Corridor 1 and Corridor 2, would follow two different routes to the Grayson Substation. Corridor 1 would be approximately 0.9 miles long, and Corridor 2 would be 1.2 miles long (TID 2009a, p. 2-25). Both would cross the existing historic TID Lower Lateral 2. They would be constructed of tubular steel angle poles and wood or steel tangent poles approximately 70–80 feet in height (TID 2009a, p. 3-11). Construction of the transmission line would require excavations nine feet deep for tangent poles and 25 feet deep for angle poles (CH2MHILL 2009f, p. 39).

The existing 69-kV transmission line, running north of the proposed site, would be reconductored to prevent potential thermal overloads (TID 2009a, p. 3-2). This transmission line runs adjacent to the Union Pacific Railroad tracks on the east side of the proposed site.

Environmental Setting

Identifying the kinds and distribution of resources necessary to sustain human life in an environment, and the changes in that environment over time, is central to understanding whether and how an area was used during prehistory and history. During the time that humans have lived in California the region in which the proposed project is located, the Central Valley, has undergone several climatic shifts. These shifts have resulted in variable availability of vital resources, and that variability has influenced the scope and scale of human use of the vicinity of the project site. Consequently, it is important to consider the historical character of local climate change, or the paleoclimate, and the effects of the paleoclimate on the physical development of the area and its ecology.

Geology and Geomorphology

The two most recent geological epochs, the Pleistocene (1.8 million–10,000 years ago), and the Holocene (10,000 years ago to the present) are the time periods in which humans reached and spread over the northern and southern American hemispheres, so landforms remaining from or created during the very late Pleistocene or throughout the Holocene are possible locations for surface or buried archaeological deposits. The surface of the A2PP plant site and environs is predominately Holocene in age.

The A2PP site and linear facilities are generally located in the Great Valley geomorphic province (TID 2009a, pp. 5.4-1–5.4-2), a structural trough approximately 435 miles long and between 44 and 56 miles wide (TID 2009a, p. 5.8-2). The Great Valley includes two elongated northwest-to-southeast trending basins: the Sacramento Valley basin to the northwest and the San Joaquin Valley basin to the southeast (TID 2009a, p. 5.8-2).

The project area is located in the San Joaquin Valley, between the courses of the Tuolumne and Merced Rivers. It is a low-gradient alluvial plain that is described historically as vast and featureless (CH2MHILL 2009g, pp. 2-3), and has been shaped by the Sierra Nevada to the east. The alluvial fans from the Sierras are vastly larger than those from the Coast Ranges to the west, due to the size and elevation of the Sierra Nevada (TID 2009a, p. 5.8-2). The Modesto Formation is the geologically youngest and topmost Late Quaternary stratigraphic unit in the project area (and in the greater San Joaquin Valley) and dates to the Wisconsinan glacial age. Deglaciation in the Sierra Nevada occurred 16–20,000 years ago and deposition of the Modesto Formation was relatively complete by 10,000 years ago (CH2MHILL 2009g, pp. 2-3).

More specifically, the project site occupies an alluvial fan of the Tuolumne River (TID 2009a, p. 5.8-5), and the near surface sediments have been deposited by flooding of the San Joaquin and Tuolumne rivers (TID 2009a, pp. 5.4-1–5.4-2). However, moving away from the rivers the topmost stratigraphic unit in the project area is the Modesto Formation, which dates from 75,000 to 10,000 years before the present. The Modesto Formation extends to a depth of 10–20 feet below the ground surface (TID 2009a, p. 5.8-5). Additionally, while it is possible the uppermost eolian facies[2] of the Modesto Formation may also include early Holocene strata and middle Holocene facies, the eolian facies of the Modesto Formation have been heavily disrupted by agricultural activities (CH2MHILL 2009g, p. 3). The preferred natural gas pipeline route and reinforcement section “extend onto the fan-toe facies of the Tuolumne River fan, where the historic San Joaquin River and the toe of the vast Tuolumne River alluvial fan created a series of floodplain, flood basin, and interdistributary channel habitats” (TID 2009a, p. 5.8-6).

Prehistoric Background

Over the years of archaeological investigation of California’s prehistory, several chronological sequences have been devised to trace the development of Central Valley Native American cultures and economies over time. These sequences are based on the persistence or replacement of such material characteristics as burial customs and artifact types. Four such schemes have been employed by Central Valley archaeologists in the twentieth and twenty-first centuries. The earliest classificatory scheme reached its most evolved expression in 1939, as the Delta sequence, positing for the Central Valley an Early Period, a Transitional Period, and a Late Period, each succeeding the last, but without absolute dates ascribed (Lillard et al. 1939; Moratto 1984, pp. 179–180). The Lillard Delta scheme was the basis for the next scheme, the Central California Taxonomic System (CCTS), in which Beardsley extended the Lillard scheme to include the Bay Area and renamed the three periods as Early Horizon, Middle Horizon, and Late Horizon (Beardsley 1954). From the 1950s through the early 1970s, California archaeologists made refinements to the trait lists by which these periods were defined (Moratto 1984, pp. 181–183) and, through the use of radiocarbon dating, began to ascribe absolute date ranges to them, which made it possible to set the beginning of the Central Valley chronological schemes at around 2000 BC. With the dimension of time added, conceptual problems with the CCTS began to emerge, as it

[2] Eolian indicates deposition by wind. Facies, in geology is applied to bodies of sedimentary rock to enable distinctions on the basis of descriptive or interpretive characteristics such as composition, grain size, bedding characteristics, and fossil components.

became clear that it did not accommodate differential rates of change in different areas, tended to obscure gradual change, and focused analysis on traits rather than on culture (Moratto 1984, pp. 183–185, 199–201).

Subsequent archaeological chronologies were more modest in scope and localized, but in 1973, in a third regional scheme, Fredrickson advanced the idea of cultural units, called patterns, that lacked temporal significance but implied a common set of lifeways in a particular geographic area. For the Central Valley, he defined three patterns, Windmiller, Berkeley, and Augustine (Fredrickson 1973; Moratto 1984, p. 201), and, along with other archaeologists, over the next decade interpreted characteristic subsistence activities, trading preferences, and social organization for them (Moratto 1984, pp. 201–214), as well as their geographic occurrence.

Because they were based on the archaeological evidence actually found and studied, these earlier schemes largely ignored the period of human use of the Central Valley that preceded 2000 BC. California archaeologists assumed that people were living in the valley before that, but had found very little evidence of it. In contrast, the fourth chronological scheme, that of Rosenthal et al. in a recent article on the archaeology of the Central Valley, includes the pre-2000 BC period. In addition, it uses calibrated radiocarbon dates to create its period divisions and claims a wider geographic applicability than the earlier schemes. It recognizes five periods: Paleo-Indian, Lower Archaic, Middle Archaic, Upper Archaic, and Emergent (Rosenthal et al. 2007, p. 150).

Paleo-Indian (11,550–to 8550 BC) and Lower Archaic (8550–5550 BC)

The earliest generally accepted evidence for the human occupation of the North American continent, dating from about 10,000 BC, is the occurrence of large, very skillfully made stone spear points, sometimes in association with the remains of now-extinct giant mammals (megafauna). This occupation is known archaeologically as the Big Game Hunting Tradition, or the Fluted Point Tradition. The Big Game Hunting Tradition, evidenced all over the American continent but centered in the Great Plains and Southwest, apparently had a nearly exclusive focus on the exploitation of large game animals. Archaeologists believe that the Big Game Hunting Tradition did not occur in California, although its characteristic fluted projectile points have been found all over the state. Rather, when the glaciers of the Pleistocene era retreated and the warmer and drier climate of the Holocene caused the sea level to rise along the coast, the formerly plentiful inland lakes to shrink or dry up, and the extinction of megafauna (Moratto 1984: 78-81), California's late Pleistocene and early Holocene peoples were forced to adopt a general hunter-forager subsistence mode and to live near reliable water sources where food was consistently available. After 5000 BC, the warmer, drier climate gave way to a cooler, moister regime, and Native Americans refined their exploitative abilities by developing their technology and adapting their lifestyles to the seasonal availability of a wide variety of local food sources.

In the Central Valley, Rosenthal's Paleo-Indian and Lower Archaic periods are represented primarily by isolated finds on the few Pleistocene and early Holocene landforms that have not been buried by alluvium from episodes of sediment deposition (Rosenthal et al. 2007, p. 151).

Middle Archaic (5550–550 BC)

Rosenthal's Middle Archaic period began with a climatic shift to a warmer and drier climate that coincided with the formation of the Delta. According to Rosenthal et al., the earliest part of this period is poorly represented archaeologically for the same reasons as the Paleo-Indian and Early Archaic periods, but numbers of sites are known for the post-2550 BC portion, and their excavation has produced extensive evidence on subsistence and technology. The latter half of the Middle Archaic period corresponds to Fredrickson's Windmiller pattern in the upper San Joaquin Valley, dating between 1850 and 750 BC (Rosenthal et al. 2007, pp. 153–154).

Windmiller sites are well represented in the Delta region (Wohlgemuth and Mears 1994, pp. 6-7; Rosenthal et al., 2007, p. 153), and 6 of the 12 known Windmiller sites are in the Stockton area (Napton 2006, pp. 6–7; Wohlgemuth and Mears 1994). Windmiller sites indicate that subsistence was based on a variety of food resources that included many kinds of fish, birds, and mammals. Seeds, roots, and acorns appear to have been important dietary elements as well, despite the paucity of milling equipment associated with Windmiller sites (Rosenthal, et al., 2007, p. 155). These dietary remains also indicate a more sedentary, year-round settlement pattern. Windmiller groups in the Delta had extensive trade networks which focused on acquiring both utility goods, such as obsidian for toolstone, and ornamental and ceremonial objects, such as abalone shell, olivella shell beads, and quartz crystals (Moratto 1984; Wohlgemuth and Mears 1994; Rosenthal, et al., 2007). Their mortuary complex is characterized by fully extended burials, placed face down, with the head in a westerly orientation. Grave goods were common. The funerary use of red ochre has also been frequently documented (Fredrickson 1973; Moratto 1984; Rosenthal, et al., 2007).

Upper Archaic (550 BC–AD 1100)

Rosenthal's Upper Archaic saw a change to a cooler, wetter, and more stable climate associated with further sediment deposition in the Central Valley, producing the material for the formation of the current surface soils there. The Upper Archaic is better represented than previous periods. Archaeological sites of the Upper Archaic are those that were termed Middle Horizon and Berkeley pattern in earlier chronological schemes, but more recent dating evidence indicates that the Windmiller pattern was not replaced by the Berkeley pattern but rather the two coexisted in different parts of the San Joaquin Valley throughout the Upper Archaic period (Rosenthal et al. 2007, pp. 155–156).

In contrast to Windmiller pattern sites, the abundant remains of milling equipment, particularly mortars and pestles, found at Berkeley pattern sites indicates a reliance on plant resources, especially acorns, as dietary staples (Moratto 1984, pp. 209–210; Wohlgemuth and Mears 1994, p. 7; Rosenthal, et al., 2007, p. 156). Other technological differences include a highly developed worked-bone industry, distinctive diagonal flaking patterns on large concave-base projectile points, and split-punched and saddle-shaped Olivella shell beads (Moratto 1984, p. 210). The contrasts continue into mortuary patterns, where the dead are generally interred in a flexed position with variable orientation and fewer grave goods. Berkeley pattern sites are the remains of large mounded villages with extensive accumulations of habitation debris and hearths. This

information, combined with the evident technological complexity, indicates that Berkeley pattern peoples were living in the same areas, not only year-round, but for long periods of time (Rosenthal 2007, p. 156).

Emergent (1100 AD–Historic Period)

The climate of Rosenthal's Emergent period was stable and similar to that of the present. This period equates to the CCTS's Late Horizon and Fredrickson's Augustine pattern. Of all the defined periods for the Delta, it is the best represented archaeologically. In this period, earlier technologies disappeared and those that are known from the time of European contact begin to appear, including the use of the bow and arrow (Rosenthal et al. 2007, pp. 157–159).

This pattern is characterized by settlements indicative of large, dense populations with elaborate trade networks and an intensive hunting, fishing, and gathering subsistence strategy with a continued focus on acorns (Moratto 1984, p. 213; Wohlgemuth and Mears 1994, p. 7). Technologically, the Augustine Pattern is distinguished by the bow and arrow, serrated arrow points, bone awls used in coiled basket making, shaped mortars and pestles, the introduction of clam shell disk beads, drilled Olivella sequin beads, incised bone tubes and abalone ornaments, large amounts of baked clay "globs" (substitutes for rocks used to cook acorn mush in baskets), and emergent pottery (Moratto 1984, p. 211, 213; Rosenthal, et al., 2007, pp. 157–158). Mortuary practices involved either cremation or pre-interment burning of the grave-pit and artifacts, coupled with flexed burials. Differential distribution of grave goods, evidence of increased trade, and settlement expansions indicate that the Augustine Pattern was a period of population growth and escalating sociopolitical complexity.

Ethnographic Background

The project area is located within the vast traditional territory claimed by the California Native American group known as the Yokuts. Yokuts is a term applied to a large and diverse group who formerly inhabited the San Joaquin Valley and Sierra Nevada foothills of central California. Anthropologists have divided the Yokuts into three groups based on geographical location. The Northern Valley Yokuts are identified with a 40-to 60-mile-wide area straddling the San Joaquin River, south of the Mokelumne River, east of the Diablo Range, and north of the sharp bend that the San Joaquin River takes to the northeast (Wallace 1978, p. 462). The Foothill Yokuts are associated with the western slopes of the Sierra Nevada from the Fresno River southward to the Kern River (Wallace 1978, p. 471). The Southern Valley Yokuts claimed the area around Tulare, Buena Vista, and Kern lakes, between their connecting sloughs, and around the lower portions of the Kings, Kaweah, Tule, and Kern rivers (Wallace 1978, p. 448). The A2PP project is located in the traditional territory claimed by the Yalesumne tribe of the Northern Valley Yokuts, who occupied the area between the Stanislaus and Tuolumne Rivers closest the the San Joaquin River.

Before the northern San Joaquin Valley was transformed for agriculture in the nineteenth century, sloughs and marshes dominated the floodplain of the San Joaquin River. This environment provided an abundant supply of animal and plant foods and materials (Wallace 1978, pp. 462–463). Tules, which could grow as tall as 10 to12 feet, dominated the region, with sage, greasewood, and bunchgrasses found in the drier

areas. The Northern Valley Yokuts used bunched tule reeds to construct light watercraft that made water travel very efficient, and trade relations were maintained with others peoples through a system of waterways and overland trails (Wallace 1978, pp. 464–466).

The Northern Valley Yokuts relied heavily on their riverine environment as a source for settlement and subsistence. Settlement locations were apparently chosen in response to subsistence resources and protection from winter and spring flooding. Groups were organized in territorial tribelets of up to 300 people, living in permanent villages on mounds along the river, although gathering parties left the villages seasonally to collect food and materials. Secondary settlements consisted of small camps or villages of several households. A Northern Valley Yokuts settlement was characterized by domed-shaped houses and shelters made of brush and tules (Wallace 1978, p. 466).

Fish, mussels, pond turtles, waterfowl, tule elk, pronghorn antelope, jackrabbits, squirrels, and quail were all found in abundance in and near the water. Salmon, in particular, is noted as a prime source of food in historical accounts of the Northern Valley Yokuts. Secondary to fishing, fowling provided the most important source of meat, as geese, ducks, and other aquatic birds were abundant in the wetlands. Harvesting of wild plants was very important to tribal subsistence. Oak trees that grew on the valley floor supplied the acorns that became a dietary staple for the Northern Valley Yokuts (Wallace 1978, pp. 463–464).

The destruction of native Delta cultures was the result of several factors, the first of which was the establishment of Spanish missions in northern California. Even before explorers and settlers made extensive contact, the missions of San Jose, Santa Clara, and others were drawing Indians away from their native villages. Secularization of the missions in 1833 forced many missionized Indians of various coastal and valley cultural affiliations to seek refuge from encroaching settlers with remote Native American groups still unaffected by Mexican influence, which further separated the refugees from their cultural roots. The introduction of European diseases had a decimating effect on native populations throughout California. A deadly malaria epidemic killed thousands of Yokuts people in 1833. The final collapse of independent Delta cultures occurred when waves of American settlers after the Gold Rush appropriated native territory for agriculture. Village mounds of the native peoples that had been abandoned were re-occupied by farmhouses, buried under artificial levees, or leveled for agriculture (Wallace 1978, p. 462; Bennyhoff 1977, p. 248).

Historic Background

Spanish Period (1769 to 1821)

The Spanish period in California spans the years 1769 to 1822, beginning with the founding of the Mission San Diego de Alcala in 1769. The San Joaquin Valley remained unexplored by the Spanish until 1772, when Pedro Fages entered the Northern San Joaquin Valley by reaching the mouth of the San Joaquin River and tracing the river upstream (Smith 2004, p. 149). Father Francisco Garces entered the valley shortly thereafter, observing native villages, wide rivers, tule swamps and huge herds of tule elk (TID 2009b, p. 4.) No permanent Spanish settlements, however, were ever established in the vicinity of the proposed A2PP project.

Mexican Period (1821 to 1848)

Mexico gained independence from Spain in 1821, and Alta California[3] became one of the provinces of the Republic of Mexico. Following the secularization of the missions in 1833, the Mexican governors began granting large tracts of land (commonly 48,000 acres) to politically prominent individuals. The 26,000-acre Rancho Orestimba was located along the west side of the San Joaquin River and is the closest rancho to the project area. The rancho was originally granted to Sebastian Nunez in 1846, who occupied it until 1859 when he sold most of it to Count Cippriani (TID 2009b, p. 5).

American Period (1848 to the present)

Following the conclusion of the Mexican-American War in 1848 the United States formally obtained California in the Treaty of Guadalupe Hidalgo. Late that same year gold was discovered at Sutter's Mill in Coloma, triggering the Gold Rush of 1849, a consequent population explosion, and California statehood in 1850. This series of events inaugurated an era of widespread settlement in California. It also marked the beginning of commerce in the San Joaquin Valley, as Stockton became the main supply city for miners headed to the southern Sierra mines, stretching from the Mokelumne River to the Kern River. The Gold Rush and the resulting influx of people created a cattle boom in California, increasing the demand for beef and other associated products. The boom lasted until 1855, when the beef market collapsed due to the importation of sheep and cattle from other states and the development of stock breeding farms. Many of the large ranchos that had been created during the Mexican Period were lost through foreclosure or sale following the collapse, as rancheros had mortgaged the land at high rates during the boom. A growing number of smaller farms appeared, which gave way to horse ranches, dairies and nurseries (TID 2009b, pp. 5-6).

California's Central Valley has been defined by transportation, irrigation and agriculture. A section of the first transcontinental railroad runs through the San Joaquin Valley. The Central Pacific Railroad began construction of the first railroad in the valley in 1870, establishing a new railroad town called Lathrop, northwest of Modesto. The rail line ran southeast toward Modesto, a planned railroad town. Ferries were also a common method of transportation. J.B. Crow, one of the first wheat growers in the area, founded the settlement of Crows Landing and established a landing on the San Joaquin River to ship his crop to market. He operated the ferry with two partners between 1870 and 1875. Crows Landing Road, just west of the project site, was established in 1870 and is the original road that connected the Davis and Maze's ferry on the Tuolumne River and the Fairbank's Ferry on the San Joaquin River. Several way stations were established along the road; these buildings are no longer extant (TID 2009B, p. 6).

Ceres, named after the Roman goddess of agriculture, was surveyed by R. K. Whitmore in 1874. Originally settled in 1867, a Central Pacific Railroad stop was established in 1872, and Ceres became a grain shipping point. Wheat cultivation, initially the primary crop in the area, had diminished by 1880 due to over-cultivation and the hot, dry summers, and the residents began to diversify crops with those that required less water.

[3] Alta (Upper) California was the Mexican name for what is now known as the State of California and was distinct from Baja (Lower) California, which remained part of Mexico after Mexico ceded Alta California to the United States in the Treaty of Guadalupe Hidalgo in 1848.

The TID, along with the Modesto Irrigation District (MID), was one of the first irrigation districts to be established following the passage of the Wright Bill in 1887. Following the completion of the La Grange Dam in 1893, TID began constructing the main canal and laterals for the district. Planning and construction moved forward slowly because of internal dissension, but work finally began in June of 1894. Work was halted in August of 1894 because the district did not have the funds to pay its contractor. By 1898, however, enough of the main canal was complete to send water 23 miles from the La Grange Dam east to Hickman. TID began irrigation in 1900, and almost all of the main canal and the laterals were completed by 1904 (CH2MHILL 2009c, DPR 523 for TID Lateral No. 2, p. 4).

Settlers had to create ditches connecting the lateral canals to their land, unless they were the fortunate few to buy land next to the canals. Hundreds of “community ditches” were built and maintained by the people using them, commonly without any formal organization (TID 2009a, pp.5.3-8–5.3-9).

By 1907, problems began, associated with the rising water table that resulted from the irrigation of the area. The first drain, the Moore Drain, was constructed that year to address the problem. Additional residents requested assistance from the TID Board to drain their land and additional drains were created beginning in 1918 (CH2MHILL 2009c, DPR 523 for TID Westport Drain, p. 1). Both drains in the project area were constructed during this time.

The founding of the TID and MID and the establishment of water conveyance systems in the early 1900s, coupled with the promise of cheap land, attracted settlers to the area. This began a revolution in the area’s agriculture, reducing the size of land holdings as settlers established dairies, poultry farms, orchards, and alfalfa fields and planted row crops, all of which required less water and land than grain fields. This led to an increase in population and trade and formed the basis for new industries. A rise in canneries in the region provided a convenient market for local products. Ferries, including those along Crows Landing Road, and the railroad connections to Modesto and Stockton also made the area more accessible (TID 2009a, pp.5.3-8–5.3-9).

The TID began improving the canals and laterals in the 1920s and 1930s, lining them with concrete to improve water flow (CH2MHILL 2009c, DPR 523 for TID Lateral No. 2 ½, p. 1). Although they began as dirt-lined ditches, many of the community ditches have been replaced with underground pipe, beginning in 1945. The trend continued, and by 1951 the miles of pipe exceeded those of open ditch. However, only 3 miles of the 250 miles of canals had been replaced with pipe as of 2002 (TID 2009b, p. 8).

A section of the Tidewater Southern Railroad (TSRR) runs adjacent to the A2PP site. Organized in 1910, the TSRR was a small interurban electric passenger and freight railway that ran between Stockton and Turlock and had a branch to Manteca. The TSRR went into service in 1912 and was bought by Western Pacific in 1917. The original vision of an electric train running from Stockton to Fresno and connecting to Bakersfield and the Pacific coast never materialized. However, the line had valuable connections in Stockton with the Western Pacific, Santa Fe, Central California Traction, Southern Pacific, and Stockton Terminal and Eastern Railroads, which made carrying freight quite profitable. After the Western Pacific acquisition it became a significant

feeder line, serving an important fruit, vegetable and wine producing area. Passenger service was discontinued by the mid-1930s, and the electric service was replaced with steam and diesel by 1946. All of the tracks were replaced after 1945 to accommodate the heavier diesel locomotives (Hatoff et al. 1995, pp. 2-149–2-150). The line is currently owned by Union Pacific.

CULTURAL RESOURCES INVENTORY

A project-specific cultural resources inventory is a necessary step in staff's effort to determine whether the proposed project may cause significant impacts to historically significant cultural resources and would therefore, under CEQA, have an adverse effect on the environment.

The development of a cultural resources inventory entails working through a sequence of investigatory phases. Generally the research process proceeds from the known to the unknown. These phases typically involve doing background research to identify known cultural resources, conducting fieldwork to collect requisite primary data on not-yet-identified cultural resources in the vicinity of the proposed project, assessing the results of any geotechnical studies or environmental assessments completed for the proposed project site, and compiling recommendations or determinations of historical significance (see "Determining the Historical Significance of Cultural Resources," below) for any cultural resources that are identified.

This subsection describes the research methods used by the applicant and Energy Commission staff for each phase and provides the results of the research, including literature and records searches (California Historical Resources Information System (CHRIS) and local records), archival research, Native American consultation, and field investigations. Staff provides a description of each identified cultural resource, its historical significance, and the basis for its significance evaluation. Assessments of the project's impacts on historically significant cultural resources, potential impacts on previously unidentified, buried archaeological resources, and proposed mitigation measures for all significant impacts are presented in a separate subsection below.

Project Area of Analysis

The inventorying of cultural resources within what staff defines as the appropriate area for the analysis of a project's potential impacts is the first step in the assessment of whether the proposed project may cause a significant impact to an important cultural resource and therefore have an adverse effect on the environment. The area that staff considers when identifying and assessing impacts to important cultural resources, called the "project area of analysis," is a composite geographic area that accommodates the analysis of each type of cultural resources that is present. The project area of analysis can vary depending on the type of cultural resources under analysis and is usually defined as a specific area within and surrounding the project site and associated linear facility corridors. For this project, staff has defined a project area of analysis for the following cultural resources types:

- For archaeological resources, the area of analysis is minimally defined as the project site footprint, plus a buffer of 200 feet, and the project linear facilities routes, plus 50 feet to either side of the routes.

- For ethnographic resources, the area of analysis is expanded to take into account traditional use areas and traditional cultural properties which may be far-ranging, including views that contribute to the historical significance of the properties. The Native American Heritage Commission (NAHC) assists project cultural resources consultants and staff in identifying these resources, and consultation with Native Americans and other ethnic or community groups may contribute to defining the area of analysis. For the A2PP, staff identified no ethnographic resources and so defined no area of analysis for them.
- For built-environment resources, the area of analysis is minimally defined as one parcel deep from the project site footprint in urban areas, but in rural areas is expanded to include a 0.5-mile buffer from the project site, and from any above-ground linear facilities, to encompass resources whose setting could be adversely affected by industrial development. For this project, the area of analysis is established at that minimum.
- For a historic district or a cultural landscape, staff defines the area of analysis based on the particulars of each siting case. The area of analysis for the TID Historic District, recognized by staff as a potentially CRHR-eligible resource surrounding the components of the A2PP, is defined as the historic boundaries of the TID.

As used by staff, the term "project areas" means the footprints of the several project components, including the plant site, the laydown area(s), and the several linear facility corridors, plus any new access roads and any borrow and disposal sites.

Determining the Historical Significance of Cultural Resources

CEQA requires the Energy Commission, as a lead agency, to evaluate the historical significance of cultural resources by determining whether they meet several sets of specified criteria. Under CEQA, the definition of a historically significant cultural resource is that it is eligible for listing in the CRHR, and such a cultural resource is referred to as a "historical resource," which is a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR", or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code," or "any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" (Cal. Code Regs., tit. 14, § 15064.5(a)). The term, "historical resource," therefore, indicates a cultural resource that is historically significant and eligible for the CRHR.

Consequently, under the CEQA Guidelines, to be historically significant, a cultural resource must meet the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the NRHP. In addition to being at least 50 years old,[4] a resource must meet at least one (and may meet more than one) of the following four criteria (Pub. Resources Code, § 5024.1):

[4] The Office of Historic Preservation's Instructions for Recording Historical Resources (1995) endorses recording and evaluating resources over 45 years of age to accommodate a potential five-year lag in the planning process.

- Criterion 1, is associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion 2, is associated with the lives of persons significant in our past;
- Criterion 3, embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important to history or prehistory.

Historical resources must also possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance (Cal. Code Regs., tit. 14, § 4852(c)).

Additionally, cultural resources listed in or formally determined eligible for the National Register of Historical Places (NRHP) and California Registered Historical Landmarks numbered No. 770 and up are automatically listed in the CRHR and are therefore also historical resources (Pub. Resources Code, § 5024.1(d)). Even if a cultural resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows a lead agency to make a determination as to whether it is a historical resource (Pub. Resources Code, § 21084.1).

The assessment of potentially significant impacts to historical resources and the mitigation that may be required of a proposed project to ameliorate any such impacts depend on CRHR-eligibility evaluations.

Background Inventory Research

Various repositories in California hold compilations of information on the locations and descriptions of cultural resources older than 45 years that have been identified and recorded in past cultural resources surveys. The Energy Commission's Data Adequacy Regulations require applicants to acquire information specific to the vicinity of their project from certain repositories and to provide it to staff as part of the AFC. Additionally, to acquire further information on potential cultural resources in the vicinity of a proposed project, the applicant is required to make inquiries of knowledgeable individuals in local agencies and organizations and to consult Native Americans who have expressed an interest in being informed about development projects in areas to which they have traditional ties.

CHRIS Records Search

The California Historical Resources Information System, or CHRIS, is a federation of 11 independent cultural resources data repositories overseen by the California State Office of Historic Preservation. These centers are located around the state, and each holds information about the cultural resources of several surrounding counties. Qualified cultural resources specialists obtain data on known resources from these centers and in turn submit new data from their ongoing research to the centers.

CHRIS Results

CH2MHILL requested a literature search from the CHRIS Central California Information Center for the area encompassing a 1.0-mile buffer around the proposed A2PP plant site, laydown areas and parking areas, and a 0.5-mile buffer around the transmission line corridors and originally proposed natural gas pipeline routes. The literature review included a review of the National Register of Historic Places (NRHP); the California Register of Historical Resources (CRHR); California Points of Historical Interest; California Historical Landmarks; historic maps; Stanislaus County Assessor maps; and local registers of historic properties, as well as all recorded archaeological sites, cultural resource surveys and excavation reports. CHRIS staff also searched for previously recorded segments of any of the TID laterals that crossed the originally proposed natural gas pipeline routes (TID 2009b, pp. 9-10). An additional search using the same parameters was requested following the selection of the proposed preferred alignment of the natural gas pipeline and the segment requiring reinforcement (CH2MHILL 2009k, p. 2-1).

Within the 1.0 mile-radius records search area of the A2PP plant site and laydown areas and within 0.5 mile of the linear facilities corridors, 42 cultural resources studies have been prepared. The majority of these reports are cultural resources survey reports (TID 2009b, p. 10).

No previously recorded cultural resources were identified within the proposed plant site or in the linear facilities corridors in the initial records search; however, several TID laterals and drains, structures and a section of the Tidewater Southern Railroad were noted on the historic maps (TID 2009b, p. 11). Two previously recorded built-environment resources were identified in the literature search for the preferred alignment of the natural gas pipeline, and one prehistoric resource was identified within 0.5 mile of the preferred alignment (CH2MHILL 2009k, App. F, pp. 2-3).

The prehistoric site (P-50-000218) was a Native American burial site that consisted of midden[5] and approximately six burials. The site was located on what appears to be a former natural levee of the San Joaquin River, approximately 550 feet from the proposed reinforcement of the existing gas line. The midden included small amounts of fractured stone, shell, and animal and human bone on the surface of a cultivated field. The raised portion of the midden was destroyed by grading in 1952 and portions of the undisturbed subsurface midden, including burials, was excavated circa 1962 by students at what is now San Francisco State University (SFSU) (Foote 1962). In an e-mail message to staff on March 5, 2010, Dr. Jeffrey B. Fentress, University NAGPRA Coordinator/Staff Archaeologist at SFSU, indicated that SFSU's Treganza Anthropology Museum housed the remains of two individuals, removed from this site, until 2002, when they were repatriated to the Santa Rosa Rancheria in Lemoore, California. The Santa Rosa Rancheria is affiliated with the Tachi Yokuts tribe. As described in the Ethnographic Background section above, the Yokuts have traditional ties to the Central Valley and the project area.

[5] A deposit containing the accumulation of refuse and discards resulting from human domestic activities over a long period of time.

Local Agency and Organization Consultation

California counties and cities may recognize particular cultural resources as locally historically important by ordinance, in general plans, or by maintaining specific lists. The Energy Commission's Data Adequacy Regulations require applicants to acquire information on locally recognized cultural resources specific to the vicinity of their project by consulting local planning agencies and local historical and archaeological societies

Results of Inquiries to Local Agencies and Organizations

CH2MHILL contacted the planning departments for both Stanislaus County and the City of Ceres. Neither agency maintains a list of cultural resources (CH2MHILL 2009f, p. 41). The Ceres Historical Society, McHenry Museum and Historical Society, and the Turlock Historical Society were also contacted by CH2MHILL; responses to their inquiries were not received.

Native American Consultation

The Native American Heritage Commission (NAHC) maintains two databases to assist cultural resources specialists in identifying cultural resources of concern to California Native Americans, referred to by staff as Native American ethnographic resources. The NAHC's Sacred Lands database has records for places and objects that Native Americans consider sacred or otherwise important, such as cemeteries and gathering places for traditional foods and materials. Their Contacts database has the names and contact information for individuals, representing a group or themselves, who have expressed an interest in being contacted about development projects in specified areas. Both applicants and staff request information via letter to the NAHC on the presence of sacred lands in the vicinity of a proposed project and also request a list of Native Americans to whom inquiries will be made to identify both additional cultural resources and any concerns the Native Americans may have about a proposed project.

Results of Inquiries Made to Native Americans

CH2MHILL contacted the Native American Heritage Commission requesting information regarding traditional cultural properties within the A2PP project area and contact information for Native American individuals and groups interested in development in San Joaquin County. The Sacred Lands file did not indicate the presence of Native American traditional cultural properties or cultural resources within the project area. A list of Native American contacts was provided, and each person on the list was contacted by CH2MHILL via mail and fax. Follow-up phone calls were made to each contact approximately one month later. An individual affiliated with the Southern Sierra Miwuk Nation responded that he had no concerns with the project. CH2MHILL did not receive comments from the remaining contacts (TID 2009b, p. 14).

Field Inventory Investigations

The Energy Commission's Data Adequacy Regulations require applicants to conduct surveys to identify previously unrecorded cultural resources in or near their proposed project areas. These surveys include a pedestrian archaeological survey and a built-environment windshield survey. The applicant includes the acquired new survey information as part of the information provided to staff in the AFC and may undertake

additional field research, including geoarchaeological studies and site testing, to respond to staff's Data Requests. Staff may also undertake additional field research to supplement information provided by the applicant.

Results of Pedestrian Archaeological Survey

The archaeological project area of analysis, including the project site, linear facilities corridors, and buffer zones, was surveyed using 10-meter pedestrian transects by CH2MHILL archaeologists. Areas surveyed included the project site, the existing 69-kV transmission line corridor, the proposed transmission line corridors and the proposed natural gas pipeline alignments. The preferred alignment of the natural gas line route was also surveyed. Exposed soils were examined when possible; however, cultural materials were not identified (TID 2009b, pp. 14–15).

One cultural resource was recorded as part of the survey, a four-mile segment of the Tidewater Southern Railroad that runs adjacent to the existing 69-kV transmission line that is proposed to be reconductored. This segment of the TSRR runs between Wood Road at the south and Hatch Road at the north. It was completed in 1916, but the rail grade, crossings, lines [rails], and ties have been upgraded to accommodate heavier loads. The line is still in use and still follows its original alignment. (TID 2009b, p. 15).

Results of Geoarchaeological Investigations

In Data Request 19, staff asked CH2MHILL's geoarchaeologist to provide an assessment of whether the sediments below 6.5 feet (the depth of known fill) at the project site, and those below 4.0 feet (the depth of archaeological disturbance) along the linear facility routes, are geologically young enough to contain archaeological deposits (CH2MHILL 2009g, p. 2).

The geoarchaeologist undertook no excavations within the A2PP archaeological project area of analysis. Rather, to answer staff's question, he relied on existing information from the Walnut Energy Center, located approximately 8 miles south of the proposed A2PP site. Excavations there had provided an opportunity for closer examination of the Late Quaternary stratigraphy of the area and confirmed that the uppermost stratigraphic unit is the Modesto Formation, ranging from 6–10 feet thick. The archaeologists found that the upper 4 feet of this unit at the Walnut Energy Center site was generally disturbed due to the agricultural use of the area. They observed that the Riverbank Formation was below the Modesto Formation, dating to approximately 130,000 years ago (CH2MHILL 2009g, p. 4).

Due to the presence of Modesto Formation sediments in the topmost stratigraphic layer in the area and the lack of recorded post-glacial sedimentation, the assessment concluded that the probability of encountering "Holocene-age archaeological material at depth on the Tuolumne River or Merced River alluvial plains is negligible in the absence of site-specific evidence to the contrary" (CH2MHILL 2009g, p. 5). The geoarchaeologist, however, did not cite evidence or provide discussion regarding the San Joaquin River fluvial system landforms, the group of landforms in which P-50-000218 was found.

Results of Windshield Survey for Built-Environment Resources

CH2MHILL executed a windshield survey of the project area to identify and record any potential built-environment resources. The survey identified 63 buildings thought to be over 45 years old, which was confirmed by the assessor's data. Prefabricated homes, trailers, and significantly altered Minimal Traditional and Ranch-style structures predominated, with 40 examples identified. These types of structures are generally not considered eligible for listing. These forty buildings were determined by CH2MHILL to be ineligible under NRHP Criteria A and B and lacked sufficient integrity to be eligible under Criterion C; these criteria are nearly identical to the CRHR Criteria 1-3. Additionally, staff had agreed that these types of structures did not require recordation on California Department of Parks and Recreation (DPR) 523 forms (TID 2009b, p. 16).

Also identified were segments of seven TID laterals (2, 2½, 3, 4, 4½, 5, 5½) and two TID drains (Harding, Prairie Flower). CH2MHILL recorded the laterals and drains as discrete 100-foot segments. The TID was up and running by the 1904–1905 growing season. Problems with the rising water table began in 1907, and the Moore Drain was constructed; additional drains, including the two in the project area, were constructed after 1918. All of the laterals, except Lateral 5, have been improved with concrete lining beginning in the 1920s; Lateral 5 remains unlined (TID 2009b, p. 17 and CH2MHILL 2009k, p. 2-2). Additionally, in response to Data Request 23, CH2MHILL evaluated the TID for its eligibility as a potential CRHR-eligible historic district (CH2MHILL 2009f, p. 43).

Summary of Identified Cultural Resources

Staff has identified 1 prehistoric archaeological site and 14 built-environment resources within the one-mile records search radius. The prehistoric site is a burial site (P-50-000218) located near the existing natural gas pipeline that is proposed for reinforcement. Eleven of the 14 built-environment resources identified are associated with the TID; one is a linear resource, the Tidewater Southern Railroad; and the remaining two are residential structures.

CULTURAL RESOURCES Table 2
Known Cultural Resources Located in the Vicinity of the Proposed Project

Resource Type and Designation	Resource Description	Previously Known/New
Prehistoric Resources	Burial Site (P-50-000218)	Previously Known
Built-Environment Resources	Tidewater Southern Railroad (P-50-000083)	Previously Known/Newly Recorded (Segments)
	TID Lower Lateral 2 (P-50-000073)	Previously Known
	TID Lateral 2	Newly recorded
	TID Lateral 2½	Newly recorded
	TID Lateral 3	Newly recorded
	TID Lateral 4	Newly recorded
	TID Lateral 4½	Newly recorded
	TID Lateral 5	Previously Known/Newly Recorded (Segments)
	TID Lateral 5½	Newly recorded
	TID Harding Drain	Newly recorded

Resource Type and Designation	Resource Description	Previously Known/New
	TID Prairie Flower Drain	Newly recorded
	TID Historic District	Newly recorded
	125 Cowan Street	Newly recorded
	5237 Crows Landing Road	Newly recorded

The applicant states that of the above identified resources, none would be impacted by the proposed project (TID 2009a, p. 5.3-32).

California Register of Historical Resources Evaluations

Under CEQA, only CRHR-eligible cultural resources that the proposed project could potentially impact need be considered in staff's recommendations for mitigation measures for project impacts. Consequently staff seeks CRHR eligibility recommendations for those cultural resources subject to possible project impacts. The existing documentation for previously known cultural resources may include CRHR eligibility recommendations, and the applicant's cultural resources specialists often make CRHR eligibility recommendations for newly identified cultural resources they discover and record in their project-related surveys. Staff considers these prior CRHR eligibility evaluations and may accept them or conclude that additional information is needed before making its own recommendations.

When the available information on known or newly identified resources that could be impacted by the proposed project is not sufficient for staff to make a recommendation on CRHR eligibility, staff may ask an applicant to conduct additional research to gather the information needed to make such a recommendation, or staff may gather the additional information. For an archaeological resource, the additional research usually entails some degree of field excavation, called a "Phase II" investigation. For an ethnographic resource, the additional research may be an ethnographic study. For built-environment resources, the additional research would probably be archival. The object of this additional research is to obtain sufficient information to enable staff to validate or make a recommendation of CRHR eligibility for each cultural resource that the proposed project could impact.

Burial Site (P-50-000218)

This prehistoric resource is a Native American burial site, which consists of midden and contained at least six human burials. The site is located on what appears to be a former levee of the San Joaquin River, which corresponds to what ethnographers have described as the preferred location for the village sites of the historic Yokuts—on mounds along the river. Archaeologists have recognized, too, that tprehistoric Central Valley village mounds, and the levees where they are often found, were mostly leveled for agricultural use in the historic period. The midden and burials of site P-50-000218 could be the remaining lower part of a village mound that was leveled. The prehistoric village mound sites along the rivers of the Central Valley have been the best sources of data on the lifeways of the prehistoric inhabitants of this region, so this site would probably have been eligible for the CRHR, under Criterion 4 ("likely to yield information important in history or prehistory"), if the register had existed at the time the site was identified and archaeologically investigated, and the remnants of it may retain such eligibility.

Turlock Irrigation District (TID)

As was mentioned above, staff, in Data Request 23, asked CH2MHILL to evaluate the TID as a CRHR-eligible historic district. CH2MHILL provided historical information and an evaluation of TID.

Located in the San Joaquin Valley, the TID is bounded by the San Joaquin, Tuolumne and Merced Rivers. It encompasses 307 square miles and overlaps both Stanislaus and Merced Counties. The existing setting is composed of irrigated agricultural fields, associated residential and ancillary buildings, commercial and industrial buildings and several communities. CH2MHILL identified the boundaries of the district as the Merced River to the south, the San Joaquin River to the west, and the Tuolumne River on the north. Per the guidance and evaluation procedures discussed in *Water Conveyance Systems in California* (JRP and CalTrans 2000), the boundaries of the TID begin with its source at the La Grange Dam to the east, making it the eastern boundary of the district, and proceed in a linear fashion. It also encompasses associated elements such as canals, drains, ditches, check dams, and maintenance roads, ending at the location of the end users (CH2MHILL 2009f, Attachment DR23-1, p, 1).

A brief history of the TID is provided in the Historic Background section, above. Beginning at the La Grange Dam, the main Turlock Diversion Canal runs along the southern bank of the Tuolumne River for approximately 7 miles to Turlock Lake. The Main Supply Canal diverges near the western end of Turlock Lake, bringing water to the northeastern edge of the TID, where it meets the Ceres Main Canal. The Ceres Main Canal carries water south through the center of the TID. The Turlock Main Canal diverges at the same gate as the Ceres Main Canal, flowing south for approximately 10 miles. Laterals divert water at intervals of two and three miles, running west to the San Joaquin River (TID 2009a, pp.5.3-8–5.3-9). The Highline Canal was added in 1911 and carries water south to the high areas along the Merced River (CH2MHILL 2009f, Attachment DR23-1, p, 1).

The TID was one of the first irrigation districts established following the passage of the Wright Act in 1887, along with the Modesto Irrigation District. Additionally, it is one of only three irrigation districts that was established early and is still in operation. CH2MHILL identified the period of significance for the district from 1893 to 1920, beginning with the construction of the La Grange Dam and encompassing the fundamental development of the TID. Contributing elements of the district were identified by CH2MHILL as:

- La Grange Dam
- Turlock Diversion Canal
- Main Supply Canal
- Ceres Main Canal
- Turlock Main Canal
- Highline Canal
- Laterals, including 1, 2, 2½, 3, 4, 4½, 5, 5½, 6, 7, 8
- Drains, including Moore, Gilstrap, Westport and Harding
- Ditches
- Associated road structures, including bridges and culverts

- Check dams/flow controls
- Diversion features, including regulator gates, valves, checks, drops and chutes
- Tunnels

According the CH2MHILL's evaluation, this is not a comprehensive list of all of the contributing features, but represents the types of features that would contribute to the district (CH2MHILL 2009f, Attachment DR23-1, pp. 3–4). CH2MHILL also determined that the TID retains its integrity of location, design, and association. Modifications, generally as a consequence of routine maintenance, have been made to TID components since 1920, most significantly the lining of the earthen laterals with concrete. These changes have somewhat affected the district's integrity of feeling, materials, and workmanship; however this action began in 1917, within the district's period of significance, and may be considered an improvement to the district overall. CH2MHILL therefore determined that the district retains sufficient integrity to convey its significance and is eligible for the CRHR under Criterion 1 for its association with the development of irrigation agriculture in California and the Central Valley, and staff concurs with this conclusion. The district would not be eligible under Criterion 2 as it does not appear to be associated with a person or persons considered important to local or California history, nor would it be eligible under Criterion 3 as a truly representative example of a particular type, period or method of construction. As it is not an archaeological resource, it would not be eligible under Criterion 4. Provided the project is constructed as proposed the project would not cause a substantial adverse change in the significance of the resource.

TID Laterals and Drains

The TID laterals in the project area were constructed between 1899 and circa 1918. For the purposes of this project, individual laterals were recorded in discrete 100-foot segments, with the exception of Lateral 2 which was recorded as a 2-mile segment. The laterals were constructed as open-earth canals and, with the exception of the section of Lateral 5 in the project area, have been lined with concrete after 1920. The drains in the project area were constructed circa 1918. All of the laterals, except for Lateral 5, have been lined with concrete which has been maintained and repaired over time. Lateral 5 remains an open earth canal. The check dams and flow controls have also been upgraded (TID 2009b, p. 17).

The project would cross the following historic laterals and drains:

<u>Laterals</u>
Lower Lateral 2
Lateral 2½
Lateral 3
Lower Lateral 4
Lateral 5
Lateral 5½

<u>Drains</u>
Harding Drain
Prairie Flower Drain
(CH2MHILL 2009k, p. 2-2)

CH2MHILL found that the individual segments of canal and drains, each being a very small part of a larger system, do not convey a clear association with significant trends in agriculture (Criterion 1), are not associated with persons important to the history of the region, state or nation (Criterion 2), and are not significant examples of a type, period or method of construction (Criterion 3). Additionally, the recorded segments are not an important source of information about canal construction or technology (Criterion 4). The canal segments retain their integrity of location and association; however the integrity of setting, materials and workmanship has been compromised, particularly due to the addition of concrete lining. The check dams also retain much of their original construction, however all have been upgraded and modern metal bridges have been added. Due to the addition of modern materials, these individual elements do not retain their integrity of feeling of the TID before 1920 (TID 2009b, pp. 17–18). Staff agrees with these conclusions.

While CH2MHILL determined that the individual lateral segments and drains would not be individually eligible for the CRHR, they would be contributing resources to a TID historic district, as discussed in the section above, and would therefore be eligible for the CRHR under Criterion 1. Should the applicant build the project as proposed, staff agrees that it would not cause a substantial adverse change in the significance of the resource.

Tidewater Southern Railroad

A four-mile section of the Tidewater Southern Railroad (TSRR) runs adjacent to the A2PP site and falls within the built-environment project area of analysis. Organized in 1910, the TSRR was a small interurban electric passenger and freight railway that ran between Stockton and Turlock and had a branch to Manteca. The TSRR went into service in 1912 and was bought by Western Pacific in 1917. The original vision of an electric rail running from Stockton to Fresno and connecting to Bakersfield and the Pacific coast never materialized. However the line had connections in Stockton with the Western Pacific, Santa Fe, Central California Traction, Southern Pacific and Stockton Terminal and Eastern Railroads, which made carrying freight quite profitable. After the Western Pacific acquisition, the TSRR was slowly converted to a freight feeder line, serving an important fruit, vegetable and wine producing area. Passenger service was discontinued by the mid-1930s, and the electric service was replaced with steam and diesel by 1946. All of the tracks were replaced after 1945 to accommodate the heavier diesel locomotives (Hatoff et al.1995, pp. 2-149–2-150).

While the TSRR made shipping the agricultural products of the area more efficient and made the region more accessible, it did not substantially contribute to the development of the area. The population began to increase in the early 1900s, and the TSRR did not reach Ceres until 1916, when the economy of the area was already established. The TSRR also never realized its goal of being a fully electric interurban railway. The TSRR is therefore not eligible for the CRHR under Criterion 1, association with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California. It is not associated with any of the major railroad figures in California (Criterion 2), nor does it represent an engineering or design achievement (Criterion 3). It does not have the potential to yield information important to the history of the area, state or nation (Criterion 4). Additionally, the modern

improvements to the rails, ties, and rail beds have compromised the integrity of the resource. Staff recommends that the TSRR is not eligible for the CRHR, and due to the lack of integrity the recorded segment would not contribute to the whole if the whole were determined eligible.

All CRHR-Eligible Resources Subject To Potential Project Impacts

In summary, staff finds that the TID Historic District is the only CRHR-eligible cultural resource within the several project areas of analysis that could potentially be impacted by the A2PP. The three remaining resources are not significant. Only the TID Historic District need be taken into account when considering impacts from the project.

While the burial site P-50-000218 would not be impacted by any A2PP project activity, the presence of that site on the same landform as the proposed pipeline reinforcement and on the same landform as the termination of the proposed natural gas pipeline (approximately 550 feet south) demonstrates that the landform on which the site and the pipelines are located is one with a high likelihood for buried archaeological deposits, as both Central Valley archaeology and ethnology suggest. No archaeological report for the original pipeline installation is available to provide conclusive evidence regarding archaeological deposits encountered during the pipeline installation, so staff must assume that CRHR-eligible buried archaeological deposits similar to those of P-50-000218 could be in the sediments around the existing pipeline. Since the terminal segment of the proposed new pipeline is also on the same landform, staff must assume that the sediments around the proposed natural gas pipeline could also contain CRHR-eligible buried archaeological deposits.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Method and Threshold for Determining Significance of Impacts to Historical Resources

Under CEQA, “a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment” (Pub. Resources Code, § 21084.1). Thus, staff analyzes whether a proposed project would cause a substantial adverse change in the significance, that is, the CRHR eligibility, of all historical resources identified in the Cultural Resources Inventory as CRHR eligible. The degree of significance of an impact depends on:

- The cultural resource impacted;
- The nature of the resource’s historical significance;
- How the resource’s historical significance is manifested physically and perceptually;
- Appraisals of those aspects of the resource’s integrity that figure importantly in the manifestation of the resource’s historical significance; and
- How much the impact will change those integrity appraisals.

DIRECT AND INDIRECT IMPACTS

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and co-existence. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources

may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic built-environment resources when those structures must be removed to make way for new structures or when the vibrations of construction impair the stability of historic structures nearby. New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with their neighbors and the setting, and when the new structures produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project construction causes obsolescence and demolition or creates improved accessibility, making vandalism or greater weather exposure possible.

Ground disturbance accompanying construction at a proposed plant site, along proposed linear facilities, and at proposed laydown areas has the potential to directly impact archaeological resources, unidentified at this time. The potential direct, physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed plant into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic structures.

Construction Impacts and Mitigation

To identify construction-related impacts to cultural resources that would need to be mitigated, staff first identifies all CRHR-eligible cultural resources (above). In the next step in its analysis, staff must evaluate the potential project impacts to the identified CRHR-eligible cultural resources to determine if these impacts are substantial and adverse. Staff then must recommend mitigation for substantial and adverse impacts on CRHR-eligible resources that cannot be avoided. Staff also must assess whether the proposed project has the potential to impact as-yet-unknown buried archaeological resources and recommend mitigation for impacts to previously unknown but CRHR-eligible resources discovered during construction, if impacts to such resources cannot be avoided.

Identification and Assessment of Direct Impacts and Recommended Mitigation

The proposed A2PP construction activities entailing ground disturbance include: site grading; hauling and storage of equipment, materials, and supplies; excavation of pads and foundations for project equipment; and excavation of a storm water retention pond. The excavation depths for the various foundations on the proposed plant site are unknown at this time. The topmost 6.5 feet at the plant site is fill, but foundation excavations for the three new, 80-foot-tall cooling towers and associated equipment could extend below that depth. Excavation of a storm water retention pond (TID 2009a, p. 2-2) could also entail depths greater than 6.5 feet. The new transmission lines would require excavations 9 feet deep for tangent poles and 25 feet deep for angle poles

(CH2MHILL 2009f, p. 39). The reconductoring of the existing 69-kV line would involve pulling new wires between the existing poles. This process can entail ground disturbance around each pole, the creation or enlargement of roads between the poles, and the creation of large areas of ground disturbance at pulling sites. The proposed new natural gas line would require excavating a trench 4 feet wide and 6–8 feet deep (CH2MHILL 2009k, p. 2-2). The applicant provided no data on the extent of ground disturbance that the reinforcement of 1.8 miles of the existing natural gas pipeline would entail, so staff must assume that the removal of the old pipe and its reinforcement with a new pipe would disturb some previously undisturbed sediments on the sides and bottom of the original installation trench.

With respect to built-environment resources, the A2PP could impact the CRHR-eligible built-environment resource, the TID Historic District. CH2MHILL, in its assessment of this resource, stated that it retains its integrity of location, design, and association, while modifications have somewhat affected the district's integrity of feeling, materials, and workmanship. So the TID Historic District reportedly has good integrity of location, design, workmanship, materials, feeling, and association. CH2MHILL did not assess the TID Historic District's integrity of setting.

Staff believes that the construction of the A2PP would have no impacts on the TID Historic District's integrity of location or its integrity of association. But, because the A2PP's natural gas line trench intersects several of the TID's laterals and drains, which staff considers to be contributing elements of the district, the construction of the A2PP could have a direct physical impact on the TID Historic District's integrity of design, integrity of workmanship, and integrity of materials. Also, because the A2PP would introduce new, tall elements into the landscape of the historic district, it could have a direct perceptual impact on the TID Historic District's integrity of setting and integrity of feeling.

However, since the applicant proposes to use trenchless methods to install the pipeline underneath the laterals and drains, no physical impact to the TID Historic District's integrity of design, integrity of workmanship, and integrity of materials would occur, and no mitigation would be needed. Also, since the existing plant and its transmission line are extant elements in the TID Historic District's setting and already contribute to the general feeling of the area, the introduction of the A2PP plant and transmission line would not adversely change the TID Historic District's setting or the general feeling of the area. So the A2PP impact to the TID Historic District's integrity of setting and integrity of feeling would not be significant, and no mitigation would be required.

With respect to archaeological resources, because of the possibility that subsurface prehistoric and historic-period archaeological deposits could be encountered during construction, CEQA advises a lead agency to make provisions for archaeological resources unexpectedly encountered during construction (Pub. Resources Code, § 21083.2; Cal. Code Regs., tit. 14, §§ 15064.5(f) and 15126.4(b)).

Consequently, the applicant proposed a number of measures intended to mitigate potential impacts to buried archaeological resources that could be discovered during the construction of the proposed A2PP (TID 2009a, pp. 5.3-34–5.3-36):

Designated Cultural Resource Specialist. The applicant will retain a designated Cultural Resource Specialist (CRS) who will be available during the entire construction period to evaluated any unanticipated discoveries. The CRS will meet the Secretary of the Interior's professional guidelines and will be responsible for preparing and presenting the worker education program, implementing construction monitoring, overseeing management of materials recovered during construction, and preparing the cultural resource management element of the project operation manual.

Worker Education Training. The applicant will design and implement a worker education program for all personnel who have the potential to encounter and alter archaeological sites, historical resources, or properties that may be eligible for the CRHR.

Prepare and implement a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan. Prior to the initiation of any earth disturbance, the applicant will prepare a construction monitoring plan and unanticipated cultural resources discovery plan with provisions for worker training, identification of workers with authorization to stop work, procedures for identifying and evaluating cultural resources, procedures for consulting Native Americans in the process of identification and evaluation, procedures for the treatment of human remains if encountered; and identification of a curation facility for materials that may be encountered during construction.

Protection and Preservation of Remains. The applicant will ensure that impacts to cultural resources related to the unanticipated discovery of human remains are treated in accordance with state law as detailed in PRC Sections 5097.91 and 5097.98, as amended.

Protection of Historical Resources during Project Operation, Maintenance, and Upgrade. The applicant will include in its operation and maintenance manual provisions that will be followed when any ground-disturbing work will occur at the power plant or linear facilities.

Although staff concurs with many of the applicant's suggested mitigation measures, staff has added further recommendations or expanded upon the applicant's suggestions to ensure that all impacts to cultural resources are mitigated to below the level of significance. Thus staff recommends that procedures for identifying, evaluating, and possibly mitigating impacts to newly discovered archaeological resources be put in place through conditions of certification to reduce those impacts to a less than significant level.

As explained above, staff has been left to assume that potentially CRHR-eligible buried archaeological deposits similar to those of P-50-000218 could be in the previously undisturbed fluvial sediments around the terminal segment of the A2PP's proposed new natural gas pipeline and the segment of existing natural gas pipeline that the project would reinforce. Staff has sufficient indicators, such as the known presence of

prehistoric archaeological sites on analogous landforms in the region, the known prehistoric and ethnographic use of riverine natural resources, knowledge of relevant geologic processes and recent depositional history, to conclude that there is a moderate-to-high potential for buried archaeological resources in the vicinity of the San Joaquin River. While staff believes that this information is sufficient to evidence a consideration of the potential presence of buried archaeological deposits in the area of the gas pipeline reinforcement, it is insufficient to inform refinements to the monitoring protocol for the proposed project that would substantially reduce the potential impact of construction excavation to any such deposits to a less than significant level.

Consequently, staff proposes a condition of certification (**CUL-1**) requiring a post-certification geoarchaeological study to complete the applicant's effort to identify CRHR-eligible buried prehistoric archaeological deposits that could be impacted by the project, a preference called out in CEQA. The study would provide the applicant with information upon which to base project design changes to avoid impacts to buried prehistoric archaeological deposits, and to verify the potential presence of such deposits and thereby provide more refined mitigation measures, particularly a more refined archaeological monitoring protocol for the installation of the new and reinforced natural gas pipelines.

Staff's proposed conditions of certification for the A2PP, then, are **CUL-1** through **CUL-8**. As discussed above, **CUL-1**, the condition requiring a post-certification, pre-construction geoarchaeological study is necessary to identify the potential presence of buried prehistoric archaeological deposits and devise mitigation measures for project impacts to them, based on the geoarchaeological study results. **CUL-1** requires that a geoarchaeologist conduct a study of the areas where the project's proposed natural gas pipeline would end and where an existing gas pipeline would be reinforced and write a report for submittal to the project owner, to the project Cultural Resources Specialist, and to the CPM. **CUL-1** includes provisions for the geoarchaeologist to receive project-generated background data and for the treatment of any buried archaeological deposits, historic or prehistoric, encountered during geoarchaeological data collection.

Additionally, **CUL-4** incorporates the results of the geoarchaeological study into the required research plan in the Cultural Resources Monitoring and Mitigation Plan and requires a mitigation plan for any CRHR-eligible buried archaeological deposit that would capture a representative sample of the information for which any such resource may be significant. **CUL-7** uses the results of the geoarchaeological study to specify the locations and depths for archaeological monitoring intended to identify buried prehistoric archaeological deposits.

For the identification of buried prehistoric archaeological deposits, **CUL-2** through **CUL-8** require having an archaeologist monitor all ground-disturbing project activities that reach the depth of any stratigraphic layers identified in the geoarchaeological field study report as potentially containing such deposits. Additionally, the Conditions provide procedures for expertly identifying, evaluating, and possibly mitigating impacts to newly discovered archaeological resources and require the project owner to train workers to recognize cultural resources, to halt ground disturbing activities in the area of an archaeological discovery, and to fund data recovery, if needed. These conditions ensure that impacts to previously unknown but CRHR-eligible archaeological resources

discovered during ground disturbance would be mitigated to a less-than-significant level.

The CEQA Guidelines (§15126.4(a)(1)(B)) advise that formulation of mitigation should not be deferred. All necessary mitigation would be provided for in the proposed conditions because the geoarchaeological report produced through the implementation of **CUL-1** would augment the cultural resources inventory, would provide the basis for recommending project design changes to avoid any CRHR-eligible archaeological deposits, and would facilitate the refinement of those monitoring requirements (mitigation measures) that address the possibility of encountering buried prehistoric archaeological resources during project-related excavation. **CUL-2** through **CUL-8** would provide for the identification, evaluation, and mitigation, if required, of any buried archaeological deposits unexpectedly encountered during project-related excavations.

In summary, because the project would have no significant impacts on known CRHR-eligible cultural resources, no mitigation would be required for such resources. Proposed Conditions of Certification **CUL-1** through **CUL-8** would provide for identification of and appropriate treatment for as-yet-unidentified CRHR-eligible archaeological resources encountered during construction.

Identification and Assessment of Indirect Impacts and Recommended Mitigation

Neither the applicant nor staff identified any indirect project impacts to any identified cultural resources, and so no mitigation measures for indirect impacts to cultural resources would be required.

Cumulative Impacts and Mitigation

A cumulative impact refers to a proposed project's incremental effects considered over time together with impacts from other nearby, past, present, and reasonably foreseeable future projects (Pub. Resources Code sec. 21083; Cal. Code Regs., tit. 14, secs. 15064(h), 15065(a)(3), 15130, and 15355). Cumulative impacts to cultural resources in the A2PP project vicinity could occur if any other existing or proposed projects, in conjunction with the proposed A2PP, had or would have impacts on cultural resources that, considered together, would be significant. The previous ground disturbance from prior projects and the ground disturbance related to the future construction of the A2PP and other proposed projects in the vicinity could have a cumulatively considerable effect on subsurface archaeological deposits, both prehistoric and historic.

In the cumulative impact analysis for the A2PP project in the AFC (Section 5.6.4), the applicant identified 34 projects under consideration or underway by the City of Ceres, 36 by the City of Modesto, and 29 by Stanislaus County. Three of the projects are public works projects on existing infrastructure and would not be expected to have an impact on cultural resources. Three industrial and three residential projects are planned within a 2.5–3.0 mile radius, and three long range planning projects are within 2 miles of the project area. The applicant stated that the cumulative impact of these projects would not result in significant unmitigated adverse impacts. The applicant therefore concluded that the A2PP and the other identified projects in the vicinity were not expected to result in significant cumulative impacts to cultural resources (TID 2009a, p.5.3-34 and p.5.6-61).

Staff has proposed conditions of certification for the A2PP project providing for identification, evaluation, and avoidance or mitigation of impacts to previously unknown CRHR-eligible archaeological resources discovered during the construction of the project. Proponents of future projects in the area could mitigate impacts to known, CRHR-eligible resources through avoidance or data recovery and could mitigate impacts to as-yet-undiscovered subsurface archaeological sites to less-than-significant levels by requiring archaeological monitoring protocols for ground disturbance through avoidance or data recovery. These are standard measures used to ensure compliance with Section 15064.5 of the State CEQA Guidelines and related provisions of the Public Resources Code. It is assumed that similar measures would be applied to other projects in the area as appropriate. Impacts to human remains can be mitigated by following the protocols established by state law in Public Resources Code section 5097.98.

Since any impacts from the proposed A2PP project would be mitigated to a less-than-significant level by the project's compliance with proposed Conditions of Certification **CUL-1** through **CUL-8**, and since similar protocols can be applied to other projects in the area, staff does not expect any incremental effects on cultural resources of the proposed A2PP project to be cumulatively considerable when viewed in conjunction with other projects.

COMPLIANCE WITH LORS

If the Conditions of Certification are properly implemented, the proposed A2PP project would result in a less-than-significant impact on known and newly found cultural resources. The project would therefore be in compliance with the applicable state laws, ordinances, regulations, and standards listed in Table 1.

The County of Stanislaus General Plan has language promoting the general county-wide preservation of cultural resources outlining one goal specific to cultural resources. The City of Ceres also has two cultural-resource specific policies in its general plan. Staff's proposed Conditions of Certification require specific actions not just to promote but to effect historic preservation and mitigate impacts to all cultural resources in order to ensure CEQA compliance. Consequently, if A2PP implements these conditions, its actions would be consistent with the general historic preservation goals of the County of Stanislaus and the City of Ceres.

CONCLUSIONS AND RECOMMENDATIONS

The project as proposed would not have an impact on known cultural resources and, with the adoption and implementation of Conditions of Certification **CUL-1** through **CUL-8**, the project would have a less-than-significant impact on archaeological resources discovered during construction-related excavation activities. Staff thus recommends that the Commission adopt these conditions. These measures are intended to complete the post-certification identification of subsurface archaeological deposits through a geoarchaeological study, to facilitate the identification and assessment of previously unidentified archaeological resources encountered during construction, and to mitigate any significant impacts from the project on any newly found resources assessed as significant. To accomplish this, the conditions provide for the hiring of a qualified

geoarchaeologist who would complete a pre-construction geoarchaeological study and report the findings to CPM; for the hiring of a Cultural Resources Specialist and archaeological monitors; for cultural resources awareness training for construction workers; for the monitoring of construction-related, ground-disturbing activities by a Cultural Resources Specialist and archaeological monitors in accordance with the results of the geoarchaeological study; for the recovery of data from CRHR-eligible discovered archaeological deposits; for the writing of a technical archaeological report on all archaeological activities and results; and for the curation of recovered artifacts and other data. When properly implemented and enforced, staff believes that these conditions of certification would reduce to less than significant any impacts to previously unidentified, CRHR-eligible cultural resources encountered during construction or operation. Additionally, with the adoption and implementation of these conditions, the A2PP would be in conformity with all applicable laws, ordinances, regulations, and standards (LORS).

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance for both the new and reinforced segments of the natural gas pipeline (includes “preconstruction site mobilization,” “construction ground disturbance,” and “construction grading, boring, and trenching,” as defined in the General Conditions for this project), the project owner shall obtain the services of a Project Geoarchaeologist (PG).

PROJECT GEOARCHAEOLOGIST

The resume for the PG shall include information demonstrating to the satisfaction of the CPM that the PG’s training and background conform to the U.S. Secretary of Interior’s Professional Qualifications Standards for prehistoric archaeology, as published in Title 36, Code of Federal Regulations, part 61, and showing the completion of graduate-level coursework in geoarchaeology or Quaternary science.

The resume of the PG shall include the names and telephone numbers of contacts familiar with the work of the PG, as a professional geoarchaeologist, on referenced projects and demonstrate to the satisfaction of the CPM that the PG has the appropriate training and experience to undertake the required geoarchaeological study.

The project owner shall ensure that the PG designs, conducts, and completes a report on a geoarchaeological field study of the San Joaquin River fluvial system landforms (floodplain, alluvial terraces, and various overbank deposits) in the vicinity of the termination of the proposed A2PP natural gas pipeline and the reinforcement of the existing PG&E Line #215, extending no more than 1.0 mile upriver and 1.0 mile downriver from that juncture. This area is referred to below as “the geoarchaeological study area.” The project owner shall be prepared to compensate a property owner or owners to gain permission for the PG to excavate and backfill backhoe trenches at the locations of the PG’s choice.

GEOARCHAEOLOGICAL STUDY

The study shall, at a minimum, consist of the following:

1. Conduct preliminary research on the geoarchaeological study area in the germane Quaternary science and geoarchaeological literatures, supported by a field reconnaissance of the that area, and generate a general description, a large scale (≥ 1:12,000) map of the landforms in the area, and develop an account of the geomorphic history of the study area to provide an understanding of the formation of the landforms on which the proposed natural gas pipeline and reinforced natural gas pipeline would be located, the ages of these landforms as they may relate to human occupation, and the geomorphic forces that have shaped the landforms and affected the three-dimensional distribution of the potential array of archaeological deposits in the geoarchaeological study area;
2. Review the previous cultural resources data compiled during the AFC review process;
3. Devise, using the landform map and data from "1" and "2," above, and submit for CPM approval, a research design for the geoarchaeological field study, that details the personnel, equipment, and analytic techniques that the PG will use to determine the precise physical character and ages of, and the depositional rates for, the sedimentary facies and the paleosols in the geoarchaeological study area. The research design shall include, at a minimum, the following methods and procedures or the PG shall propose alternative methods and procedures to obtain the same required data:

    a. the excavation of backhoe trenches in representative locations along the proposed alignment of the natural gas pipeline and along the alignment of the to-be-reinforced, existing natural gas pipeline or in analogous landform contexts less than one mile up- or down-stream from the subject pipeline alignments that will afford the opportunity to reliably characterize all alluvial landforms in the geoarchaeological study area fluvial system deposits to the anticipated depth of the proposed pipeline trenches. The number of backhoe trenches appropriate to this study shall be negotiated between the CPM and the PG on the basis of the work in Subpart 1 above, but shall in no case exceed 12 trenches. Excavation methods shall include, at minimum::

        1) the complete recordation of one prepared profile from each backhoe trench to include reasonably detailed written descriptions of each lithostratigraphic and pedostratigraphic unit in each profile, a measured profile drawing, and a profile photograph with a metric scale and north arrow,

        2) the screening of a small (3 5-gallon buckets) sample of sediment from the major lithostratigraphic units in each profile or from two arbitrary levels in each profile through ¼-inch hardware cloth, and

        3) the collection and assaying of enough soil humate samples to reliably radiocarbon date the master stratigraphic column for the alluvial deposits along the proposed pipeline route;

b. a protocol to inform the project owner of any buried prehistoric archaeological deposits encountered during geoarchaeological data collection to facilitate informing the CPM;

c. the testing of any buried archaeological deposits encountered during geoarchaeological data collection solely to assess their physical extent and material culture content, and record them on Department of Parks and Recreation (DPR) 523 “Primary Record” and “Archeological Site Record” forms (Forms 523A and C), additionally completing other DPR 523 series forms, as appropriate;

d. providing a report to the project owner that

1) describes, based on the available extant literature and any new primary field data, the historical geomorphology of the study area;

2) presents, in graphic and written form, a master column that characterizes the stratigraphy of the subject portion of the geoarchaeological study area to the maximum depth that ground disturbance will occur in that or each such area;

3) provides a processual geologic interpretation and the approximate age of subdivisions of the master column that reflect shifts in local depositional regimes or depositional history, and that reflect time ranges that correspond to the prehistory and history of the geoarchaeological study area region, as presently understood;

4) presents descriptions of any encountered archaeological deposits, including an assessment of the lateral and vertical extents of each such deposit, descriptions of the material culture content and the character of the sedimentary matrix for each deposit, and an assessment of the approximate age of each deposit;

5) provides a preliminary interpretation of the character of the prehistoric or historic land use that each encountered archaeological deposit represents;

6) interprets, with reference to the information gathered and developed above, the likelihood that buried archaeological deposits are present in each of the subdivisions developed in “3)” above, and, on the basis of the current understanding of the prehistory and history of the geoarchaeological study area region, what site types are most likely to be found;

7) recommends, on the basis of the conclusions in “6)” where and to what depth archaeological monitoring should be done during construction in all project construction areas; and

8) assesses the potential necessity and the approximate cost of mitigating project impacts to any CRHR-eligible buried archaeological deposits found during the geoarchaeological study, and recommends options for project re-design to avoid any potential CRHR-eligible deposits found.

9) includes in appendices to the report completed DPR 523 forms for any archaeological deposits encountered and recorded.

The PG may elect to obtain specialized technical services beyond the requisite radiometric dating to assist in data-gathering and data-interpreting activities.

The project owner shall ensure that the PG conducts the geoarchaeological field study according to the CPM-approved research design and completes and submits the geoarchaeological field study report. The project owner shall submit the report to the CPM. No ground disturbance shall occur prior to CPM approval of the PG, or prior to CPM approval of the geoarchaeological research design, or prior to CPM approval of the geoarchaeological field study report, unless specifically approved by the CPM.

The project owner shall review the geoarchaeological field study report and evidence consideration of any project design changes recommended by the PG.

Verification:

1. At least 135 days prior to the start of ground disturbance, the project owner shall provide the resume of the PG to the CPM, for review and approval.

2. At least 120 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, all confidential cultural resources documents, maps, and drawings, and the Staff Assessment to the PG.

3. At least 100 days prior to the start of ground disturbance, the project owner shall submit the geoarchaeological research design to the CPM for review and approval.

4. At least 90 days prior to the start of ground disturbance, the project owner shall ensure that the PG initiates the approved geoarchaeological study and shall notify the CPM by letter or in an e-mail that the PG has initiated the CPM-approved geoarchaeological study.

5. At least 45 days prior to the start of ground disturbance, the project owner shall submit the PG's report to the CRS and the CPM for review and approval.

CUL-2 Prior to the start of ground disturbance (includes "preconstruction site mobilization," "ground disturbance," and "construction grading, boring and trenching," as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRSs, if alternates are needed. The CRS shall manage

all monitoring, mitigation, curation, and reporting activities required in accordance with the Conditions of Certification (COCs). The CRS may elect to obtain the services of Cultural Resources Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the CRHR of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to CPM approval of the CRS and alternates, unless such activities are specifically approved by the CPM. Approval of a CRS may be denied or revoked for reasons including but not limited to non-compliance on this or other Energy Commission projects. After all ground disturbance is completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, if the CPM approves. With the discharge of the CRS, these cultural resources conditions no longer apply to the activities of this power plant.

CULTURAL RESOURCES SPECIALIST

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61 (36 C.F.R., part 61). In addition, the CRS shall have the following qualifications:

1. The CRS's qualifications shall be appropriate to the needs of the project and shall include a background in anthropology, archaeology, history, architectural history, or a related field;
2. At least three years of archaeological or historical, as appropriate (per nature of predominant cultural resources on the project site), resource mitigation and field experience in California; and
3. At least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

1. a B.S. or B.A. degree in anthropology, archaeology, historical archaeology or a related field and one year experience monitoring in California; or

2. an A.S. or A.A. degree in anthropology, archaeology, historical archaeology or a related field, and four years experience monitoring in California; or
3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology or a related field, and two years of monitoring experience in California.

CULTURAL RESOURCES TECHNICAL SPECIALISTS

The resume(s) of any additional technical specialist(s), e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

Verification:

1. At least 45 days prior to the start of ground disturbance, the project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval.
2. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project. If there is no alternate CRS in place to conduct the duties of the CRS, a previously approved monitor may serve in place of a CRS so that ground disturbance may continue up to a maximum of 3 days without a CRS. If cultural resources are discovered then ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.
3. At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition.
4. At least 5 days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide additional letters to the CPM identifying the CRMs and attesting to their qualifications.
5. At least 10 days prior to any technical specialists beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval.
6. 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.

CUL-3 Prior to the start of ground disturbance, the project owner shall provide the CRS with copies of the AFC, data responses, confidential cultural resources reports, all supplements, and the Energy Commission's Staff Assessment (SA) for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting cultural features or materials. If

the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification:

1. At least 40 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, confidential cultural resources documents, and the Energy Commission FSA to the CRS and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.
2. At least 15 days prior to the start of ground disturbance, if there are changes to any construction-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.
3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.
4. Weekly during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.
5. Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-4 Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. The following statement included in the Introduction: “Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A.”
2. A proposed general research design, scoped, to the extent feasible, to the time periods and the archaeological resource types established by the geoarchaeological field study, that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the area in which the project is located, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. A specific mitigation plan shall be prepared for any unavoidable impacts to any CRHR-eligible (as determined by the CPM) resources. A prescriptive treatment plan may be included in the CRMMP for limited data types.
3. Specification of the implementation sequence and the estimated time frames needed to accomplish all construction-related tasks during the ground disturbance and post-ground–disturbance analysis phases of the project.
4. Identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.
5. A description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.
6. A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance and construction, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from construction-related effects.
7. A statement that all encountered cultural resources over 50 years old shall be recorded on Department of Parks and Recreation (DPR) 523 forms and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission’s *Guidelines for the Curation of*

Archaeological Collections, into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced, if any, during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.
9. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.
10. A description of the contents and format of the final Cultural Resources Report (CRR), which shall be prepared according to ARMR guidelines.

Verification:

1. Upon approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CRMMP for the CRS.
2. At least 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.
3. At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-5 The project owner shall submit the final CRR to the CPM for approval. The final CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, DPR forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval within 24 hours of the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification:

1. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

2. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.
3. Within 90 days after completion of ground disturbance (including landscaping), if cultural materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, to accept cultural materials, if any, from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.
4. Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Tribal Chairpersons of any Native American groups requesting copies of construction-related reports.

CUL-6 Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes. 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. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
6. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;
7. An informational brochure that identifies reporting procedures in the event of a discovery;

8. An acknowledgement form signed by each worker indicating that they have received the training; and
9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.
2. At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.
3. Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-7 The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time all ground disturbance along the linear facilities routes, according to the recommendations of the geoarchaeological field study required in CUL-1, and as approved by the CPM, to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of the earth-removing activities in the areas specified in the previous paragraph, for as long as the activities are ongoing. Where excavation equipment is actively removing dirt and hauling the excavated material farther than fifty feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no further than fifty feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

A Native American consultant shall monitor ground disturbance associated with the installation of the new natural gas pipeline and associated with the reinforcement of the existing natural gas pipeline in the geoarchaeology study area, if the geoarchaeology field study report recommends archaeological monitoring in that area. Contact lists of interested 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. If efforts to

obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. After finding those efforts to be satisfactory, the CPM may either identify other potential monitors or allow ground disturbance to proceed without a Native American monitor.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered.

On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.
2. Monthly while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.

3. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.
4. Daily and as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form of communication acceptable to the CPM.
5. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

CUL-8 The project owner shall grant authority to halt ground disturbance to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CPM), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting as provided in these conditions shall continue during the project's ground-disturbing activities elsewhere. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1. The CRS has notified the project owner and the CPM within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.
2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.
3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.
4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation

of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.
2. Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery.
3. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

CULTURAL RESOURCES ACRONYM GLOSSARY

A2PP	Almond 2 Power Plant
AD	After the Birth of Christ
AFC	Application for Certification
ARMR	Archaeological Resource Management Report
BC	Before the Birth of Christ
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
Conditions	Conditions of Certification
CRHR	California Register of Historical Resources
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist

DPR 523	Department of Parks and Recreation cultural resource inventory form
FSA	Final Staff Assessment
LORS	laws, ordinances, regulations, and standards
MCR	Monthly Compliance Report
MLD	Most Likely Descendent
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
Project Area of Analysis	The project site (see below) plus what additional areas staff defines for each project that are necessary for the analysis of the cultural resources that the project may impact.
Project Site	The bounded area(s) identified by the applicant as the area(s) within which they propose to build the project.
PSA	Preliminary Staff Assessment
SHPO	State Historic Preservation Officer
Staff	Energy Commission cultural resources technical staff
TID	Turlock Irrigation District
WEAP	Worker Environmental Awareness Program

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HAZARDOUS MATERIALS MANAGEMENT

Testimony of Alvin Greenberg, Ph.D. and Rick Tyler

SUMMARY OF CONCLUSIONS

Staff's evaluation of the proposed Almond 2 Power Plant (A2PP), along with staff's proposed mitigation measures, indicates that hazardous materials use at the site would not present a significant impact to the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations, and standards. A Risk Management Plan (RMP) has been prepared by the Turlock Irrigation District (the applicant) for the existing Almond Power Plant (APP) and it has been approved by the Stanislaus County Environmental Resources Hazardous Materials Division (SCER-HMD). Since the A2PP would use the same ammonia storage facility as the existing APP, the current approved RMP is adequate to fulfill the requirements of the Health and Safety Code, section 25531 et seq. Staff therefore proposes that the existing RMP, Hazardous Materials Business Plan, Process Safety Management Plan, and Spill Prevention, Control, and Countermeasures (SPCC) plan only be revised and updated.

INTRODUCTION

The purpose of this hazardous materials management analysis is to determine if the proposed Almond 2 Power Plant (A2PP) project has the potential to cause significant impacts on the public as a result of the use, handling, storage, or transportation of hazardous materials at the proposed site. 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 those impacts to the extent feasible.

This analysis does not address the potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and provide them with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. The **Worker Safety and Fire Protection** section of this document describes applicable requirements for the protection of workers from these risks.

Anhydrous ammonia (99% NH_3) is the only extremely hazardous material proposed to be either used or stored at the A2PP project in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j) (TID2009a, Table 5.5-1). Anhydrous ammonia will be used to control oxides of nitrogen (NO_x) emissions through selective catalytic reduction. The use of anhydrous ammonia increases the risk that would otherwise be associated with the use of the less hazardous aqueous form of ammonia. Anhydrous ammonia is stored as a liquefied gas at high pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release, which can rapidly introduce large quantities of the material to the ambient air and result in high down-wind concentrations.

Other hazardous materials, such as mineral and lubricating oils, cleaning detergents, and welding gasses will be present at the proposed A2PP project. No extremely hazardous materials or those with high acute toxicity will be used on site during construction, and none of these materials pose significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and/or their environmental mobility.

Although no natural gas is stored, the project will also involve the handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. The proposed A2PP would require the installation of a new gas pipeline connecting the project to Pacific Gas and Electric's (PG&E's) natural gas pipeline #215, located approximately 10 miles south of the project site (TID2009a, Section 5.5.2.5). The A2PP project would also require the transportation of anhydrous ammonia to the facility. This document addresses all potential impacts associated with the use and handling of hazardous materials.

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.

HAZARDOUS MATERIALS MANAGEMENT Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
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 that store, handle, or produce significant quantities of extremely hazardous materials.
The CAA section on risk management plans (42 USC §112(r))	Requires states to implement a comprehensive system informing local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
49 CFR 172.800	The U.S. Department of Transportation (DOT) requirement that suppliers of hazardous materials prepare and implement security plans.
49 CFR Part 1572, Subparts A and B	Requires suppliers of hazardous materials to ensure that all their hazardous materials drivers are in compliance with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written Spill Prevention, Control, and Countermeasures (SPCC) plan to be prepared for facilities that store oil that could leak into navigable waters.
Title 49, Code of Federal Regulations, Part 190	Outlines gas pipeline safety program procedures.

Title 49, Code of Federal Regulations, Part 191	Addresses transportation of natural and other gas by pipeline: annual reports, incident reports, and safety-related condition reports. Requires operators of pipeline systems to notify the DOT of any reportable incident by telephone and then submit a written report within 30 days.
Title 49, Code of Federal Regulations, Part 192	Addresses transportation of natural and other gas by pipeline and minimum federal safety standards, specifies minimum safety requirements for pipelines including material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use that characterize the surrounding land. This part also contains regulations governing pipeline construction (which must be followed for Class 2 and Class 3 pipelines) and the requirements for preparing a pipeline integrity management program.
Section 311, CWA (33 USC Section 1251 et seq.) Oil Pollution Prevention (40 CFR 112)	Requires preparation of an Spill Prevention Control and Countermeasures (SPCC) plan if oil is stored in a single AST with capacity greater than 660 gallons or if total petroleum storage at a facility is greater than 1,320 gallons. Administered by the Regional Water Quality Control Board (RWQCB).
Federal Register (6 CFR Part 27) interim final rule	A regulation of the U.S. Department of Homeland Security that requires facilities that use or store certain hazardous materials to submit information to the department so that a vulnerability assessment can be conducted to determine what certain specified security measures shall be implemented.
State	
Title 8, California Code of Regulations, section 5189	Requires facility owners to develop and implement effective safety management plans that ensure 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 Risk Management Plan (RMP) process.
Title 8, California Code of Regulations, section 458 and sections 500 to 515	Sets forth requirements for the 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 of Mechanical Engineers (ASME) Boiler and 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.
California Health and Safety Code, section 25531 to 25543.4	The California Accidental Release Program (CalARP) requires the preparation of a Risk Management Plan (RMP) and off-site consequence analysis (OCA) and submittal to the local Certified Unified Program Agency for approval.
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.”
Hazardous Material Business Plan, Cal HSC Sections 25500 to 25541; 19 CCR Sections 2720 to 2734	Requires the submittal of a chemical inventory and planning and reporting for management of hazardous materials.
Process Safety Management: Title 8 CCR Section 5189	Requires facility owners to develop and implement effective process safety management plans when toxic, reactive, flammable, or explosive chemicals are maintained on site in quantities that exceed regulatory thresholds.
California HSC Sections 25270 through 25270.13	Requires the preparation of a Spill Prevention, Control, and Countermeasures (SPCC) Plan if 10,000 gallons or more of petroleum is stored on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the Certified Unified Program Authority (CUPA).
California Safe	Prevents certain chemicals that cause cancer and reproductive toxicity from

Drinking Water and Toxic Enforcement Act (Proposition 65)	being discharged into sources of drinking water.
California Public Utilities Commission General Order 112-E and 58-A	Contains standards for gas piping construction and service.
Local	
CUPA Program (Health and Safety Code Section 25180)	To consolidate, coordinate and make consistent the administrative requirements, permitting, inspection activities, enforcement activities and fees for hazardous waste and hazardous materials programs in each jurisdiction.
Environmental Health Emergency Response Program (California Health and Safety Code Sections 25200 et seq. and 101040)	Interagency emergency response team guidelines for incidents involving hazardous material spills or releases, including assessments to evaluate actual or potential environmental contamination an/or exposure, recommendations for short and long-term cleanup, and oversight of the cleanup activities performed by the responsible parties or environmental assessment firms.

The Certified Unified Program Agency (CUPA) with the responsibility to review Risk Management Plans (RMPs) and Hazardous Materials Business Plans (HMBPs) is the Stanislaus County Environmental Resources Hazardous Materials Division (SCER-HMD). With regard to seismic safety issues, the site is classified as Seismic Design Category D. Construction and design of buildings and vessels storing hazardous materials will meet the seismic requirements of the California Code of Regulations Title 24 and the 2007 California Building Code (TID2009a, Section 2.2.1.1.1).

SETTING

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

- local meteorology;
- terrain characteristics; and
- location of population centers and sensitive receptors relative to the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction, and air temperature, affect both 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 their associated health risks. When wind speeds are low and the atmosphere stable, dispersion is severely reduced but can lead to increased localized public exposure.

Recorded wind speeds and directions are described in the **Air Quality** section (5.1) and **Appendix 5.1B** of the Application for Certification (AFC) (TID2009a).

TERRAIN CHARACTERISTICS

The location of elevated terrain is often an important factor in assessing potential exposure. An emission plume resulting from an accidental release may impact high

elevations before impacting lower elevations. The site topography is generally flat, at an elevation of about 80 feet above mean sea level. The immediate vicinity is also flat, and no elevated terrain exists for many miles from the site (TID2009a, Section 5.1.1.1).

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a major bearing on health risk. Sensitive receptors in the project vicinity (within a 3-mile radius) are listed in **Appendix 5.9A** and shown in **Figure 5.9-4** of the AFC (TID2009a). The nearest sensitive receptor is a child care center located approximately 0.5 miles northeast of the site. The nearest residences are located about 0.3 miles northeast of the site (TID2009a, Section 5.9.2).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals and natural gas were evaluated. Staff's analysis addresses the potential impacts on all members of the population including the young, the elderly, and people with existing medical conditions that may make them more sensitive to the adverse effects of hazardous materials. In order to accomplish this goal, staff utilized the most current public health exposure levels (both acute and chronic) that are established to protect the public from the effects of an accidental chemical release.

In order to assess the potential for released hazardous materials to travel off site and affect the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some hazardous materials must be used at power plants. Therefore, staff conducted its analysis by examining the choice and amount of chemicals to be used, the manner in which the applicant will use the chemicals, the manner by which 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 and administrative controls concerning hazardous materials usage. Engineering controls are the physical or mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent the spill of hazardous material from occurring, or which can either limit the spill to a small amount or confine it to a small area. Administrative controls are the rules and procedures that workers at the facility must follow that will help to prevent accidents or to 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 (TID2009a, Section 5.5). Staff's assessment followed the five steps listed below.

- Step 1: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in **Table 5.5-1** of the AFC (TID2009a) 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 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-sized 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 mitigation measures also include 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, as reduced by 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.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Small Quantity Hazardous Materials

Hazardous chemicals such as mineral and lubricating oils, cleaning detergents, welding gasses, and other various chemicals would be used and stored in relatively small amounts. (See **Hazardous Materials Appendix B** for a list of all chemicals proposed for use and storage at A2PP). In conducting the analysis, staff determined in Steps 1 and 2 that these materials, although present at the proposed facility, pose a minimal potential for off-site impacts since they will be stored in small quantities, have low mobility/volatility, or have low levels of toxicity. These hazardous materials are eliminated from further consideration.

During the construction phase of the project, small quantities of hazardous materials such as gasoline, diesel fuel, motor oil, hydraulic fluid, welding gases, lubricants, solvents, cleaners, sealants, paint, and paint thinners would be used. Any impact of spills or other releases of these materials will be limited to the site because of the small quantities involved, their infrequent use (and therefore reduced chances of release), and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all very low volatility and

represent limited off-site hazards even in larger quantities. Handling of hazardous materials during construction would follow best management practices (BMPs) to minimize environmental effects (TID2009a, Section 5.5.2.3.1).

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 large quantity hazardous materials: natural gas and anhydrous ammonia. However, the project will be limited to using, storing, and transporting only those hazardous materials listed in Appendix B of this document as per staff's proposed condition **HAZ-1**.

Large Quantity Hazardous Materials

Natural Gas

Natural gas poses a fire and/or possible explosion risk because of its flammability. Natural gas is composed mostly of methane, but also contains ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is 90% in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14%, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or possible explosion if a release occurs under certain specific conditions. However, it should be noted that, due to its tendency to disperse rapidly (Lees 1998), natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas, but can explode under certain conditions (as demonstrated by the recent natural gas detonation in Belgium in July 2004).

While natural gas would be used in significant quantities, it would not be stored on site. It would be delivered via a new pipeline that will connect the proposed project to PG&E's natural gas pipeline #215. The proposed pipeline would be approximately 11.6 miles long and connect with PG&E's existing supply line. (TID2009a, Section 5.5.2.5). The risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) code 85A requires both the use of double-block and bleed valves for gas shut off and automated combustion controls. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start up, thereby 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 would significantly reduce the potential for equipment failure because of either improper maintenance or human error.

Since the proposed facility will require the installation of a new gas pipeline off-site, impacts from this pipeline need to be evaluated. The design of the natural gas pipeline is governed by 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 is damage caused by earthquake. Existing codes also address seismic hazard in design criteria (see discussion 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 and data from the National Response Center for the period 1990 - 2004, 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, the January 1995 gas pipeline failures in Kobe, Japan, the January 19, 1995 gas explosion in San Francisco, the pipeline explosion in Belgium in July 2004, and the natural gas storage fire in Texas in August 2004, the safety of the gas pipeline is of paramount importance. However, it must be noted that those pipelines which failed in 1989 to 1995 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. The Belgium gas pipeline explosion was due to construction equipment rupturing the line, not due to earthquake or structural failure.

If loss of containment 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. To summarize, the four major causes of accidental releases from natural gas pipelines are: Outside Forces - 43%, Corrosion -18%, Construction/Material Defects -13%, and Other - 26%.

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. These result 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 the uncertainty regarding the locations of older pipelines.

The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192):

Class 1: Pipelines in locations within 220 yards of ten or fewer buildings intended for human occupancy in any 1-mile segment.

Class 2: Pipelines in locations within 220 yards of more than ten but fewer than 46 buildings intended for human occupancy in any 1-mile segment. This class also includes drainage ditches of public roads and railroad crossings.

Class 3: Pipelines in locations within 220 yards of more than 46 buildings intended for human occupancy in any 1-mile segment, 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). (The proposed project gas pipeline would fall into this class.)

Class 4: Pipelines in locations within 220 yards of buildings with 4 or more stories above ground in any 1-mile segment.

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 pipeline owner will be required to develop and implement these plans as per the regulation adopted May 2004 (49 CFR Part 192). The regulations prescribe minimum requirements for a pipeline Integrity Management Program to be prepared and followed by every operator of a pipeline segment located in a high consequence area. A high consequence area is defined as any location where the pipeline traverses a Class 3 or 4 area (see above) or other areas under specified circumstances. The integrity management program must contain the required elements as described in section 192.911 including an identification of all high consequence areas, a baseline assessment plan including methods of assessing pipeline integrity and a schedule for completing the assessment, an identification of threats to each pipeline segment including a risk assessment, an evaluation of mitigation measures, implementation

procedures, and monitoring procedures. The regulations also include requirements for reassessment intervals, which range from 7 to 20 years depending on the type of reassessment and the operating percentage of the pipeline.

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 CPUC.

The natural gas pipeline for the A2PP project will be designed for Class 1 service and will meet all standards of the California Public Utilities Commission (CPUC) General Order 112-D and 58-A standards as well as all federal regulations (TID2009a, Sections 5.5.2.5). CPUC General Order 112-E, Section 125.1 requires that at least 30 days prior to the construction of a new pipeline, the owner must file a report with the commission that will include a route map for the pipeline. The natural gas pipeline will 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 (see Table 1 LORS).

Staff concludes that compliance with existing LORS would be sufficient to ensure minimal risks of pipeline failure.

Anhydrous Ammonia

Anhydrous ammonia would be used to control the emission of oxides of nitrogen (NO_x) from the combustion of natural gas at the A2PP project. The accidental release of anhydrous ammonia without proper mitigation can result in significant down-wind concentrations of ammonia gas. A2PP would use the existing APP ammonia storage tank which has a maximum capacity of 12,000 gallons. The tank is filled with 100% ammonia in a liquid state under pressure to a maximum of 85% of capacity such that the maximum amount of anhydrous ammonia on site would be 10,200 gallons (TID2009a, Section 5.5.2.3). The tank is surrounded by an above-ground secondary containment basin capable of holding the full contents of the tank plus rainfall.

Based on staff's analysis described above, anhydrous ammonia is the only hazardous material that may pose a significant risk of off-site impact. The use of anhydrous ammonia can result in the release of ammonia vapor in the event of a spill. This is a result of its high vapor pressure and the large amounts of anhydrous ammonia that will be used and stored on site.

To assess the potential impacts associated with an accidental release of anhydrous ammonia, staff uses four benchmark exposure levels of ammonia gas occurring off site. These include:

1. the lowest concentration posing a risk of lethality, 2,000 parts per million (ppm);

2. the concentration immediately dangerous to life and health level of 300 ppm;

3. the emergency response planning guideline level 2 of 150 ppm, which is also the RMP level 1 criterion used by U.S. Environmental Protection Agency (EPA) and California; and

4. the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm.

If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff will also assess the probability of occurrence of the release, the severity of the consequences, and the nature of the potentially exposed population in determining whether the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant impact. A detailed discussion of the exposure criteria considered by staff, as well as their applicability to different populations and exposure-specific conditions, is provided in **HAZARDOUS MATERIALS Appendix A**.

Staff reviewed the Off-site Consequence Analysis (OCA) contained ion the existing RMP and found the analysis to be conducted according to US EPA and CalARP guidelines. Staff was able, therefore, to rely on this effort to conclude that the predicted airborne ammonia concentrations off-site due to an accidental or intentional release of anhydrous ammonia from the storage tank or the piping would be are less than significant.

Mitigation

The potential for accidents resulting in the release of hazardous materials is greatly reduced through implementation of a safety management program that would include the use of both engineering and administrative controls. Elements of both facility controls and the safety management plan are summarized below.

Engineering Controls

Engineering controls help to prevent accidents and releases (spills) from moving off site and affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the applicant for use at the A2PP project include:

- construction of secondary containment areas surrounding each of the hazardous materials storage areas designed to contain accidental releases that might happen during storage or delivery in addition to the water associated with 20 minutes of fire suppression;
- physical separation of stored chemicals in isolated containment areas in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes;
- installation of an automated sprinkler system and an exhaust system for the indoor hazardous materials storage area;

- use of the existing APP anhydrous ammonia storage facility equipped with a secondary containment structure capable of holding the entire volume of the tank plus precipitation;
- use of ammonia sensors set to alarm at 20ppm at the existing anhydrous ammonia tank and at each ammonia skid at the A2PP CTGs; and
- process protective systems including continuous tank level monitors with automatic alarms, automated leak detectors, temperature and pressure monitors and alarms, and excess flow and emergency block valves.

Administrative Controls

Administrative controls also help prevent accidents and releases (spills) from moving off site and affecting neighboring communities by establishing worker training programs, process safety management programs, and complying with all applicable health and safety laws, ordinances, and standards.

A worker health and safety program will be prepared by the applicant and include (but not be limited to) the following elements (see the **Worker Safety and Fire Protection** section for specific regulatory requirements):

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- procedures to ensure the proper use of personal protective equipment;
- safety operating procedures for the operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and
- emergency response actions including facility evacuation, hazardous material spill clean-up, and fire prevention.

At the facility, the project owner will be required to designate an individual with the responsibility and authority to ensure a safe and healthful work place. The project health and safety official will oversee the health and safety program and have the authority to halt any action or modify any work practice to protect the workers, facility, and the surrounding community in the event of a violation of the health and safety program.

The applicant has already prepared a risk management plan for anhydrous ammonia, as required by 42 USC §112(r) and CalARP regulations for the existing APP. The RMP includes a hazard assessment and a program for preventing and responding to accidental releases. In addition, a Hazardous Materials Business Plan was prepared as well as a Process Safety Management Plan (PSMP) for anhydrous ammonia. These plans were reviewed by staff during a site visit in October 2009 to review and evaluate hazardous materials safety and site security and found to be adequate.

The existing APP hazardous materials business plan (HMBP), which incorporates state requirements for the handling of hazardous materials, as well as the existing RMP would be updated by the applicant to include the A2PP project (TID2009a, Section 5.5.4.2.1). Other administrative controls would be required in proposed Conditions of

Certification **HAZ-1** (limitations on the use and storage of hazardous materials and their strength and volume) and **HAZ-2** (updating the existing HMBP, RMP, SPCC Plan, and PSMP) and **HAZ-3** (development of a safety management plan).

On-Site Spill Response

In order to address the issue of spill response, the facility will prepare and implement an emergency response plan that includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, and prevention equipment and capabilities, as well as other elements. Emergency procedures will be established which include evacuation, spill cleanup, hazard prevention, and emergency response. The presence of oil in a quantity greater than 1,320 gallons might invoke a requirement to prepare a Spill Prevention, Control, and Countermeasure (SPCC) Plan. The quantity of oil proposed to be on-site for the A2PP would be in excess of the minimum quantity that requires such a plan. However, there are no known waters of the State or of the United States and thus staff's position is that no SPCC Plan is required by 40 CFR 112. However, pursuant to California HSC Sections 25270 through 25270.13, the A2PP will be required to prepare a SPCC because it will store >76,000 gallons or more of oils on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the Certified Unified Program Authority (CUPA).

The Ceres Emergency Services – Fire Division (CFD) Station #3 would be the first responder to hazardous materials incidents with backup support provided by other CFD stations and the City of Modesto Fire Department. CFD Station #3 and the City of Modesto fire department have trained personnel and equipment for an initial hazardous materials response. CFD Station #3 is located about 0.3 miles from the A2PP site with a response time of 2-4 minutes. In the event of a large spill, the Stanislaus County Environmental Resources - Hazardous Materials Division, Hazardous Materials Response Team, would provide a full response (TID2009a, Section 5.5.2.5). The County's Hazmat Team is located at the Department of Environmental Resources on Cornucopia Way, about 0.5 miles from the A2PP site. Their response time would be 10-15 minutes (CFD 2009). Staff finds that the available local hazmat teams are capable of responding to a hazardous materials emergency call from A2PP with an adequate response time.

Transportation of Hazardous Materials

Hazardous materials including anhydrous ammonia will be transported to the facility by tanker truck. While many types of hazardous materials will be transported to the site, staff believes that transport of anhydrous ammonia poses the predominant risk associated with hazardous materials transport.

Staff reviewed the applicant's transportation routes for hazardous materials delivery. Trucks would travel the Caltrans-approved routes currently in use for the Almond Power Plant. These are: from SR-99 to Crows Landing Road to the project's access road or from I-5 to Crows Landing Road to the project's access road (TID2009a, Section 5.5.2.2). Schools located within 500 feet of the hazardous materials transportation route on Crows Landing Road between the freeways and the project are listed in Table DR33-

1 of Data Responses Set 1A. Both transportation routes pass within 500 feet of two schools and the route from I-5 also passes within 500 feet of a place of worship (CH2MHILL2009f, Data Response #33).

Ammonia can be released during a transportation accident and the extent of impact in the event of such a release would depend upon the location of the accident and the rate of dispersion of ammonia vapor from the surface of the anhydrous ammonia pool. The likelihood of an accidental release during transport is dependent upon 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 (SR-99 or I-5). Staff believes it is appropriate to rely upon the extensive regulatory program that applies to the shipment of hazardous materials on California highways to ensure safe handling in general transportation (see Federal Hazardous Materials Transportation Law 49 USC §5101 et seq, DOT regulations 49 CFR subpart H, §172–700, and California Department of Motor Vehicles (DMV) regulations on hazardous cargo). These regulations also address the issue of driver competence. See AFC section 5.12 for additional information on regulations governing the transport of hazardous materials.

To address the issue of tanker truck safety, anhydrous ammonia will be delivered to the proposed facility in DOT-certified vehicles with design capacities of 6,500 gallons. These vehicles will be designed to DOT Code MC-331. These are high-integrity high-pressure tanker trucks designed to haul caustic materials under pressure such as anhydrous ammonia. Staff has, therefore, proposed Condition of Certification **HAZ-4** to ensure that, regardless of which vendor supplies the anhydrous ammonia, delivery will be made in a tanker that 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 risk of a hazardous materials transportation accident.

Staff used the data from the Davies and Lees (1992) article, which references both the 1990 Harwood et al. and 1993 Harwood studies, to determine that the frequency of release for the transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per 1,000,000 miles traveled on well-designed roads and highways. The maximum use of anhydrous ammonia during operation of the proposed A2PP project will require about 10 tanker truck deliveries of anhydrous ammonia per year in addition to the two deliveries currently required for the APP (TID2009a, Section 5.5.4.2.2). Each delivery will travel either 3.5 miles from SR-99 along Crows Landing Road, or about 18.8 miles from I-5 along Fink Road and Crows Landing Road to the facility.

This would result in either 42 or 226 miles of delivery tanker truck travel in the project area per year (with a full load) for all 12 deliveries. Staff believes that the risk over this distance is insignificant. Data from the U.S. DOT show that the actual risk of a fatality over the past five years from all modes of hazardous material transportation (rail, air, boat, and truck) is approximately 0.1 in 1,000,000.

In addition, staff used a transportation risk assessment model (developed by staff) in order to calculate the probability of an accident resulting in a release of a hazardous material due to delivery from the freeway to the facility. Results show a risk of 1.8 in 1,000,000 for one trip from SR-99 and 2.0 in 1,000,000 for one trip from I-5. The maximum annual risk, including all 12 deliveries required for the operation of both APP and A2PP, was calculated to be 21.7 in 1,000,000 for deliveries from SR-99 and 24.1 in 1,000,000 for deliveries from I-5. This risk was calculated using accident rates on various types of roads (in this case, urban multilane undivided and rural two-lane) with distances traveled on each type of road computed separately. Although it is an extremely conservative model in that it includes risk of accidental release from all modes of hazardous materials transportation and does not distinguish between a high-integrity steel tanker truck and other less secure modes, the results still show that the risk of a transportation accident less than significant. The transportation of similar volumes of hazardous materials on the nation's highways is neither unique or infrequent.

Staff therefore believes that the risk of exposure to significant concentrations of anhydrous ammonia during transportation to the facility is insignificant because of the remote possibility that an accidental release of a sufficient quantity could be dangerous to the public. The transportation of similar volumes of hazardous materials on the nation's highways is neither unique nor infrequent. Staff's analysis of the transportation of anhydrous 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.

In order to further ensure that the risk of an accident involving the transport of anhydrous ammonia to the power plant is insignificant, staff proposes an additional administrative control in proposed Condition of Certification **HAZ-5** that would require the use of only one specific route to the site, that being the shortest route from an interstate (SR-99 to Crows Landing Road to the facility). Staff has driven this route and it consists of two lanes or more in each direction with traffic lights at each intersection. Although it passes by a school and it is staff's policy to avoid routes that pass directly by schools, it is the safest and best route among all the alternatives reviewed by staff. Other routes would be longer, pass through questionably safe intersections and/or involve use roads of one-lane in each direction. However, to address the concerns raised about the transportation of aqueous ammonia through the area, staff proposes that the applicant consult with the local school district and that no deliveries be made during hours when the route is used by school buses (see proposed condition **HAZ-5**).

Based on the environmental mobility, toxicity, the quantities at the site, and frequency of delivery, it is staff's opinion that anhydrous ammonia poses the predominate risk associated with both use and hazardous materials transportation. Staff concludes that the risk associated with the transportation of other hazardous materials to the proposed project does not significantly increase the risk of ammonia transportation.

Seismic Issues

It is possible that an earthquake could cause the failure of a hazardous materials storage tank. An earthquake could also cause failure of the secondary containment system (berms and dikes), as well as the failure of electrically controlled valves and pumps. The failure of all of these preventive control measures might then result in a vapor cloud of hazardous materials that could move off site and affect 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, have all heightened concerns about earthquake safety.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused both to several large storage tanks and to smaller tanks associated with the water treatment system of a cogeneration facility. The 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 when designing and building storage tanks and containment areas to withstand a large earthquake. Staff also reviewed the impacts of the February 2001 Nisqually earthquake near Olympia, Washington, a state with similar seismic design codes as California. No hazardous materials storage tanks failed as a result of that earthquake. Referring to the sections on **Geologic Hazards and Resources** and **Facility Safety Design** in the AFC, staff notes that the proposed facility will be designed and constructed to the standards of the California Code of Regulations, Title 24, and the 2007 California Building Code for Seismic Zone D (TID2009a, Section 2.2.1.1.1).

Staff has also begun a review of the impacts of the recent earthquakes in Haiti (January 12, 2010; magnitude 7.0) and Chili (February 27, 2010; magnitude 8.8). The building standards in Haiti are extremely lax while those in Chile are as stringent and modern as California seismic building codes. Yet, the preliminary reports show a lack of impact on hazardous materials storage and pipelines infrastructure in both countries. For Haiti, this most likely reflects a lack of industrial storage tanks and gas pipelines; for Chili, this most likely reflects the use of strong safety codes.

Therefore, on the basis of what occurred in Northridge with older tanks and the lack of failures during the Nisqually earthquake (with newer tanks) and in the 2010 Chilean earthquake, staff determined that tank failures during seismic events are not probable and do not represent a significant risk to the public.

Site Security

The applicant proposes to use hazardous materials identified by the U.S. EPA as requiring the development and implementation of special site security measures to prevent unauthorized access. The U.S. EPA published a Chemical Accident Prevention Alert regarding site security (EPA 2000a), the U.S. Department of Justice published a special report entitled *Chemical Facility Vulnerability Assessment Methodology* (US DOJ 2002), the North American Electric Reliability Council published *Security Guidelines for the Electricity Sector* in 2002 (NERC 2002), and the U.S. Department of Energy (DOE) published the draft *Vulnerability Assessment Methodology for Electric Power Infrastructure* in 2002 (DOE 2002). The energy generation sector is one of 14

areas of critical infrastructure listed by the U.S. Department of Homeland Security. On April 9, 2007, the U.S Department of Homeland Security published in the Federal Register (6 CFR Part 27) an interim final rule requiring that facilities that use or store certain hazardous materials conduct vulnerability assessments and implement certain specified security measures. This rule was implemented with the publication of Appendix A, the list of chemicals, on November 2, 2007. The list includes anhydrous ammonia and thus the existing APP along with the proposed A2PP would fall under the jurisdiction of the CFATS.

The applicant has stated that a security plan will be prepared for the proposed facility prior to operations. Perimeter security measures utilized for this facility may include security guards, security alarm for critical structures, perimeter breach detectors and onsite motion detectors, and a video or still camera monitoring system (TID2009a, Section 5.5.4.2.5).

In order to ensure that neither this project nor a shipment of hazardous material is the target of unauthorized access, staff's proposed Conditions of Certification **HAZ-6** and **HAZ-7** address both construction security and operation security plans. These plans would require implementation of site security measures consistent with the above-referenced documents.

The goal of these conditions of certification is to provide for the minimum level of security for power plants necessary for the protection of California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for the A2PP project is dependent upon the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of the consequences of that event. The results of the off-site consequence analysis prepared as part of the RMP will be used, in part, to determine the severity of consequences of a catastrophic event.

In order to determine the level of security, the Energy Commission staff uses an internal vulnerability assessment decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the North American Electric Reliability Council's (NERC) 2002 guidelines, the U.S. DOE VAM-CF model, and the U.S. Department of Homeland Security regulations published November 2007 in the Federal Register (Interim Final Rule 6 CFR Part 27). Staff determined that this project would fall into the category of low vulnerability. Staff also visited the exiting Almond power plant site and reviewed and discussed security measures with the applicant. The proposed Almond-2 project would be wholly contained within an expanded security perimeter of the existing power plant. Staff's review of existing security measure found them to be exemplary, thorough, and consist with that required by the Energy Commission at other power plants. The security perimeter fence would be upgraded to include CCTV that will have the capability to view the entire perimeter, as well as monitor the front gate and the anhydrous ammonia storage tank. Staff therefore proposes that certain security measures be upgraded but does not propose that the project owner conduct its own vulnerability assessment or make major revisions to its security procedures.

Existing security measures include perimeter fencing and breach detectors, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contacts in the event of a security breach. Site access for vendors shall be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors will have to maintain their transport vehicle fleet and employ only properly licensed and trained drivers. The project owner will be required, through the use of contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. DOT requirements for hazardous materials vendors to prepare and implement security plans (as per 49 CFR 172.802) and to ensure that all hazardous materials drivers are in compliance through personnel background security checks (as per 49 CFR Part 1572, Subparts A and B). The compliance project manager (CPM) may authorize modifications to these measures or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. DOE, or the NERC, after consultation with both appropriate law enforcement agencies and the applicant.

CUMULATIVE IMPACTS AND MITIGATION

Staff analyzed the potential for the existence of cumulative impacts. A significant cumulative hazardous materials impact is defined as the simultaneous uncontrolled release of hazardous materials from multiple locations in a form (gas or liquid) that could cause a significant impact where the release of one hazardous material alone would not cause a significant impact. Existing locations that use or store gaseous or liquid hazardous materials, or locations where such facilities might likely be built, were both considered. The applicant provided a description of existing and planned projects in the vicinity of the proposed A2PP, and noted that there are numerous projects in that region that use or store ammonia, which is commonly used for agricultural purposes and refrigeration (TID2009a, Section 5.5.3). The nearest facility storing ammonia is the WinCo Central Valley Distribution Center, located immediately north of the proposed A2PP site. This facility uses anhydrous ammonia for refrigeration and stores about 7,200 gallons in a closed loop system. The second closest facility that stores ammonia is the Stanislaus Farm Supply, located north of the A2PP site. This facility stores up to 26,000 gallons of anhydrous ammonia, 30,000 gallons of aqueous ammonia, and 6,000 pounds of methyl bromide gas.

In the event that the A2PP project is certified by the Energy Commission, the RMP for the APP will be revised to reflect the additional use, but not an increased amount stored, of anhydrous ammonia. Additionally, the applicant will develop and implement a hazardous materials handling program for A2PP independent of any other projects considered for potential cumulative impacts. Staff believes that the facility, as proposed by the applicant and with the additional mitigation measures proposed by staff, poses a minimal risk of accidental release that could result in off-site impacts. Upon review of the existing RMP, staff determined that the Off-site Consequence Analysis (OCA) modeling of a worst-case release of anhydrous ammonia from the existing APP storage tank was conducted using appropriate input variable and thus accepts its conclusions.

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 A2PP site and another facility at the same time. Therefore, staff concludes that the proposed A2PP facility would not contribute to a significant hazardous materials-related cumulative impact.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

One letter from the City of Ceres expressed the opinion that the AFC contained an inadequate description of the location of all schools in the project area and along the hazardous materials transportation route. The City asked that the Ceres Unified School District be contacted to ensure that all schools have been properly located and considered.

*Response: Staff has visited the area twice and feels that insofar as the risks of hazardous materials use, storage and transport are concerned, the engineering and administrative controls that the applicant proposes and that staff suggests will be more than adequate to reduce the risk of an impact at any school in the area to less than significant. However, to further reduce the risk of an impact from a transportation accident, staff proposes that the applicant consult with the local school district and that anhydrous ammonia deliveries be prohibited during hours when the delivery route is used by school buses (see proposed condition **HAZ-5**).*

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Staff concludes that construction and operation of the A2PP project would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS) regarding long-term and short-term project impacts in the area of hazardous materials management.

CONCLUSIONS

Staff's evaluation of the proposed project (with proposed mitigation measures) indicates that hazardous material use will pose no significant impact to the public. Staff's analysis also shows that there will be no significant cumulative impact. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable LORS. In response to Health and Safety Code, section 25531 et seq., the applicant has already prepared an RMP and a PSMP for the existing APP which were determined by staff to be adequate**.** Staff's proposed conditions of certification address the issue of the transportation, storage, and use of anhydrous ammonia, in addition to site security matters.

Staff recommends that the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed, and operated to comply with all applicable LORS and to protect the public from significant

risk of exposure to an accidental ammonia release. If all mitigation proposed by the applicant and staff are required and implemented, the use, storage, and transportation of hazardous materials will not present a significant risk to the public.

Staff proposes six conditions of certification mentioned throughout the text (above), and listed below. Condition of Certification **HAZ-1** ensures that no hazardous material would be used at the facility except as listed in **Appendix B** of the staff assessment, unless there is prior approval by the Energy Commission compliance project manager.

Since the proposed A2PP will be built on the site of the existing APP and both power plants will share some hazardous materials storage infrastructure, staff proposes that the existing HMBP, RMP, PSMP, and the SPCC Plan all be revised to reflect the new power plant. This requirement can be found in proposed condition **HAZ-2**. Staff believes that an accidental release of anhydrous ammonia during transfer from the delivery tanker to the storage tank is the most probable accident scenario and therefore proposes Condition of Certification (**HAZ-3**) requiring the development of a safety management plan for the delivery of all liquid hazardous materials, including anhydrous ammonia. The development of a safety management plan addressing the delivery of all liquid hazardous materials during construction, commissioning, and operations will further reduce the risk of any accidental release not addressed by the proposed spill-prevention mitigation measures and the RMP. This plan would additionally prevent the mixing of incompatible materials that could result in toxic vapors. The transportation of hazardous materials is addressed in Conditions of Certification **HAZ-4** and **HAZ-5.** Time-of-day transport of anhydrous ammonia is also addressed in **HAZ-5**. Site security during both the construction and operations phases is addressed in Conditions of Certification **HAZ-6** and **HAZ-7.**

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous materials not listed in Appendix B, below, or in greater quantities or strengths than those identified by chemical name in Appendix B, below, unless approved in advance by the Compliance Project Manager (CPM).

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

HAZ-2 The project owner shall revise and update the current Hazardous Materials Business Plan (HMBP), Risk Management Plan (RMP), Spill Prevention, Control, and Countermeasure Plan (SPCC Plan), and Process Safety Management Plan (PSMP) and submit the revised plans to the Stanislaus County Environmental Resources Hazardous Materials Division (SCER-HMD) for review and comment and to the CPM for review and approval.

Verification: At least 60 days prior to the start of commissioning of the A2PP, the project owner shall provide a copy of a final updated HMBP, RMP, SPCC Plan, and the PSMP to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of anhydrous ammonia and other liquid hazardous materials by

tanker truck. 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 incompatible hazardous materials including provisions to maintain lockout control by a power plant employee not involved in the delivery or transfer operation. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least 30 days prior to the start of commissioning of the A2PP, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 The project owner shall direct all vendors delivering anhydrous ammonia to the site to use only tanker truck transport vehicles which meet or exceed the specifications of DOT Code MC-331. The project owner shall provide this direction in a letter to the vendor(s) at least thirty (30) days prior to the receipt of anhydrous ammonia on site.

Verification: At least 30 days prior to the start of commissioning of the A2PP, the project owner shall submit to the CPM for review and approval copies of the notification letter to supply vendors indicating the transport vehicle specifications.

HAZ-5 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM. Trucks will travel on SR-99 to Crows Landing Road to the power plant site. The project owner shall obtain approval of the CPM if an alternate route is desired. The project owner shall also consult with officials of the Ceres Unified School District regarding school bus schedules and shall prohibit vendors through contractual language from transporting anhydrous ammonia to the site at times that would coincide with school bus traffic along Crows Landing Road.

Verification: At least 30 days prior to the start of commissioning of the A2PP, the project owner shall submit to the CPM for review and approval copies of:

1) notices to hazardous materials vendors describing the required transportation route,
2) the contract with the aqueous ammonia vendor describing the time of day limitation on deliveries, and
3) evidence that officials of the Ceres Unified School District have been consulted.

HAZ-6 Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

1. perimeter security consisting of fencing enclosing the construction area;
2. security guards;
3. site access control consisting of a check-in procedure or tag system for construction personnel and visitors;

4. written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on site or off site;

5. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and

6. Evacuation procedures.

Verification: At least 30 days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

HAZ-7 The project owner shall revise and update the existing site-specific operations security plan and make it available to the CPM for review and approval. The project owner shall continue to implement existing site security measures that address physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per NERC 2002).

The updated Operation Security Plan shall include the following additions to the existing security:

1. The existing man-gates located along the perimeter fence shall either be removed or replaced with a type that affords increased security by allowing immediate egress but which prohibits entry.

2. Written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;

3. A statement (refer to sample, **Attachment A**), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy;

4. A statement(s) (refer to sample, **Attachment B**), signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site;

5. A statement(s) (refer to sample, **Attachment C**), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.802, and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;

6. An upgraded CCTV system including cameras able to pan, tilt, and zoom and that have low-light capability, are recordable, and are able to view 100% of the perimeter fence, the anhydrous ammonia storage tank, the outside entrance to the control room, and the front gate from a monitor in the power plant control room.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures such as protective barriers for critical power plant components—transformers, gas lines, and compressors—depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with both appropriate law enforcement agencies and the applicant.

Verification: At least 30 days prior to the start of commissioning of the A2PP, the project owner shall notify the CPM that a revised and updated site-specific operations site security plan is available for review and approval. In the annual compliance report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed and that updated certification statements have been appended to the operations security plan. In the annual compliance report, the project owner shall include a statement that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

SAMPLE CERTIFICATION (Attachment A)

Affidavit of Compliance for Project Owners

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for employment at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment B)

Affidavit of Compliance for Contractors

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for contract work at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment C)

Affidavit of Compliance for Hazardous Materials Transport Vendors

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that the below-named company has prepared and implemented security plans in conformity with 49 CFR 172.880 and has conducted employee background investigations in conformity with 49 CFR 172, subparts A and B,

_____

(Company name)

for hazardous materials delivery to

_____

(Project name and location)

as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

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HAZARDOUS MATERIALS
Appendix A

Basis for Staff's Use of 75 Parts Per Million Ammonia Exposure Criteria

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BASIS FOR STAFF'S USE OF 75 PARTS PER MILLION AMMONIA EXPOSURE CRITERIA

Staff uses a health-based airborne concentration of 75 parts per million (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 the U.S. Environmental Protection Agency and the California Environmental Protection Agency in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's analysis of the proposed project. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices and actions are implemented in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines 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. California Environmental Quality Act requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through feasible changes or alternatives to the proposed project.

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

HAZARDOUS MATERIALS Appendix 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]	OSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 minutes	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 minutes	Protects nearly all segments of general population from irreversible effects.
STEL[2]	NIOSH	Adult healthy male workers	35 ppm	15 minutes, 4 times per 8-hour day	No toxicity, including avoidance of irritation.
EEGL[3]	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 minutes	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 minutes 30 minutes 10 minutes	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 hours	No toxicity or irritation on continuous exposure for repeated 8-hour 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 minutes	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) warned that the young, elderly, asthmatics, those with bronchitis, and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

REFERENCES FOR HAZARDOUS MATERIALS APPENDIX A, TABLE 1

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ABBREVIATIONS FOR HAZARDOUS MATERIALS APPENDIX A, TABLE 1

ACGIH, American Conference of Governmental and Industrial Hygienists

AIHA, American Industrial Hygienists Association

EEGL, Emergency Exposure Guidance Level

EPA, Environmental Protection Agency

ERPG, Emergency Response Planning Guidelines

IDLH, Immediately Dangerous to Life and Health Level

NIOSH, National Institute of Occupational Safety and Health

NRC, National Research Council

STEL, Short Term Exposure Limit

STPEL, Short Term Public Emergency Limit

TLV, Threshold Limit Value

WHO, World Health Organization

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HAZARDOUS MATERIALS
Appendix B

Hazardous Materials Proposed for Use at the A2PP

HAZARDOUS MATERIALS Appendix B
Hazardous Materials Proposed for Use and Storage On-site at the A2PP

Material	CAS No.	Application	Hazardous Characteristics	Maximum Quantity On Site
Acetylene	47-86-2	Welding gas	Health: asphyxiant gas Physical: flammable	435 cubic feet
Anhydrous Ammonia (100 percent NH3 by weight)	7664-41-7	Control NOx emissions through selective catalytic reduction	Health: Corrosive, irritation to permanent damage from inhalation, ingestion and skin contact Physical: Combustible, but difficult to burn	10,200 gallons
Anti-scalant	Various	Prevent scale in reverse osmosis membranes	Health: may cause slight irritation to the skin and moderate irritation to the eyes Physical: non flammable	250 gallons
Citric Acid	77-92-9	Reverse osmosis membrane cleaning	Health: causes irritation to the skin, gastrointestinal tract, and respiratory tract Physical: slightly flammable	350 pounds
Cleaning Chemicals	Various	Cleaning	Health: refer to individual chemical labels Physical: refer to individual chemical labels	Varies (less then 25 gallons liquids or 100 pounds solids for each chemical)
Cleaning Chemicals/ Detergents	None	Periodic cleaning of combustion turbine	Health: refer to individual chemical labels Physical: refer to individual chemical labels	55 gallons
EPA Protocol Gases	Various	Calibration gases	Health: refer to individual chemical labels Physical: refer to individual chemical labels	1,400 cubic feet
Hydraulic Oil	None	High-pressure combustion turbine starting system, turbine control valve actuators	Health: hazardous if ingested Physical: combustible	600 gallons
Laboratory Reagents	Various	Water/wastewater laboratory analysis	Health: refer to individual chemical labels Physical: refer to individual chemical labels	130 pounds
Lubrication Oil	None	Lubricate rotation equipment (e.g., gas turbine bearings)	Health: hazardous if ingested Physical: flammable	775 gallons
Mineral Insulating Oil	8012-95-1	Transformers/switch yard	Health: minor health hazard Physical: can be combustible depending on manufacturer	75,000 gallons (in numerous transformers)
Oxygen	7782-44-7	Welding gas	Health: therapeutic overdoses can cause convulsions Physical: oxidizing agent; actively supports combustion	562 cubic feet

Paint	Various	Touchup of painted surfaces	Health: refer to individual container labels Physical: refer to individual container labels	Varies (less then 25 gallons liquids or 100 pounds solids for each type)
Propane	74-98-6	Torch gas	Health: asphyxiant gas, causes frostbite to area of contact Physical: flammable	None
Propylene Glycol	57-55-6	Anti-icing system	Health: hazardous if ingested Physical: combustible	2,000 gallons (contained within equipment)
Sodium Bisulfite (NaHSO3)	7631-90-5	Reduce oxidizers in reverse osmosis feed to protect the RO membranes	Health: corrosive, irritation to eyes, skin, and lungs; may be harmful if digested Physical: non flammable	25 pounds
Sodium Carbonate (Na2CO3)	497-19-8	Reverse osmosis membrane cleaning	Health: may cause irritation or burns to eyes, skin, and lungs; may be harmful if digested Physical: non flammable	200 pounds
Sodium Hydroxide (NaOH)	1310-73-2	Convert CO2 to alkalinity for removal by reverse osmosis	Health: causes eye and skin burns, hygroscopic, may cause severe respiratory tract irritation with possible burns may cause sever digestive tract irritation with possible burns Physical: non flammable	400 gallons
Sodium Nitrite (NaNO2)	7632-00-0	Closed & chilled water loop corrosion inhibitor	Health: very hazardous in case of eye contact (irritant), of ingestion, of inhalation, hazardous in case of skin contact (irritant), slightly hazardous in case of skin contact, prolonged exposure may result in skin burns and ulcerations, over-exposure by inhalation may cause respiratory irritation, sever over-exposure can result in death, inflammation of the eye is characterized by redness, watering, and itching Physical: non flammable	On site only periodically and during initial start-up

Source: TID2009a, Tables 5.5-1 through 5.5-3.
a. Reportable quantities for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act.

LAND USE

Testimony of Jeanine Hinde

SUMMARY OF CONCLUSIONS

Energy Commission staff has evaluated the potential impacts to land use and agricultural resources from implementation of the proposed Almond 2 Power Plant (A2PP), in accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.) and the State CEQA Guidelines (14 Cal. Code Regs. § 15000 et seq.). The analysis is based on a review of information provided by Turlock Irrigation District (TID) (applicant) on the A2PP. It includes an assessment of the A2PP's compliance with applicable laws, ordinances, regulations, and standards (LORS).

The proposed site for the A2PP project includes properties that are adjacent to the existing Almond Power Plant (APP). Most of the facilities for the main plant would be constructed on two properties that are owned by TID, including the parcel where the existing APP is situated. Some of the facilities associated with the proposed A2PP are proposed for siting on a separate parcel along the west side of the TID properties. Energy Commission staff has determined that the A2PP would be consistent with the applicable LORS upon the applicant providing documentation demonstrating that the A2PP would be constructed and operated on a legal parcel of land. Condition of certification **LAND-1** is proposed to require the project applicant to complete a lot line adjustment and record of survey for filing with the City of Ceres and Stanislaus County. Completing the required actions to move the property boundaries at the plant site would enable construction and operation of the A2PP on a legal parcel of land.

Implementation of the A2PP would require construction of two new 115-kilovolt (kV) transmission lines. Although installation of these new lines would occur within rights-of-way and along existing agricultural access roads, construction of one utility pole would result in the loss of approximately 4 square feet (sq. ft.) of Prime Farmland. The Stanislaus County General Plan requires mitigation to compensate for the loss of farmland resulting from residential development in the unincorporated areas of the county. Because the A2PP would not convert agricultural land to residential uses, no mitigation measure is required to compensate for this loss of Prime Farmland acreage. The A2PP would not cause any additional conversion of Important Farmland to nonagricultural uses.

Construction of the natural gas pipeline for the A2PP could result in minor and temporary impacts to Important Farmland, including Prime Farmland, Farmland of Local Importance, Farmland of Statewide Importance, and Unique Farmland. Installation of segments of the natural gas pipeline could also temporarily affect agricultural lands held under Williamson Act contracts. Condition of certification **LAND-2** is proposed to ensure that agricultural lands are restored to their pre-project condition for all areas that are disturbed during construction of the natural gas pipeline. With implementation of condition of certification **LAND-2**, Energy Commission staff finds the project would have less-than-significant impacts on Important Farmland and Williamson Act contracted lands.

INTRODUCTION

The land use analysis for the A2PP is focused on the project's consistency with applicable LORS and the potential effects of converting existing uses (e.g., agricultural land) to other uses.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Land Use Table 1 provides a general description of land use LORS applicable to the proposed project. The project's consistency with these LORS is discussed in Land Use Table 2. No federal LORS pertaining to land use are applicable to the A2PP project.

Land Use Table 1 Laws, Ordinances, Regulations, and Standards (LORS)	
Source	**Description of Applicable LORS**
State	
Professional Land Surveyors' Act (Business and Professions Code commencing with § 8700)	The California State Legislature adopted The California Professional Land Surveyors' Act (Act) to govern the land surveyor industry. The Act established the California Board for Professional Engineers and Land Surveyors as the governing board for the purposes of the Act. The law authorizes the board to develop and enforce the rules that are required to carry out the provisions of the Act.
Subdivision Map Act (Government Code commencing with § 66410)	The Subdivision Map Act (Map Act) regulates and controls the design and improvement of subdivisions. Any property divided into two or more parcels is subject to the Map Act. The Map Act is administered by the local agency in the county in which the property is located.
California Land Conservation Act of 1965 (Williamson Act) (Gov. Code commencing with § 51200)	The Williamson Act addresses uses that are considered compatible in areas that are identified as agricultural preserves and on contracted lands. Construction and maintenance of various utilities are identified as compatible uses in areas identified as agricultural preserves (Gov. Code § 51238). The A2PP project would supply electric power, which is considered a compatible use. The Williamson Act establishes principles of compatibility on contracted lands. Approved uses may not compromise long-term productivity or displace or impair current or reasonably foreseeable agricultural operations (Gov. Code § 51238.1).
Local	
City of Ceres General Plan	
Land Use and Community Design Element	The City of Ceres General Plan land use designations for the A2PP site are General Industrial (GI) and Community Facility (CF). The GI designation is applied primarily in the western part of the planning area, allowing for a wide range of industrial and manufacturing uses. The CF designation is applied to the city's major public and private facilities and institutional uses.
Public Facilities and Services Element, Goal 4.L	Goal 4.L: To provide adequate levels of service for utility services provided by private companies and ensure that these are constructed to minimize negative effects on surrounding development.
City of Ceres Service Road Industrial Master Plan (SRIMP)	

Land Use Table 1 Laws, Ordinances, Regulations, and Standards (LORS)	
Source	**Description of Applicable LORS**
Development Plan Approval, Land Use Classifications, and Development Standards	The A2PP site is within an area that is governed by the Service Road Industrial Master Plan (SRIMP). The SRIMP addresses requirements for approval of development plans: *The approval of development plans…is required for specific development projects (Section 18.20.080 of the Ceres Municipal Code). Although the development plans…must be consistent with the approved Master Plan, minor variations from the Master Plan may be approved by the Planning Director or Planning Commission in conjunction with the review and approval of a development plan…provided that any such changes are consistent with the intent of the Master Plan's overall land use program.* Land use classifications for the project area are identified in the SRIMP, as follows: 1) Community Facility (C-F), which applies to existing TID Facilities, and 2) General Industrial (M-2), which applies to heavy industrial uses and properties with the Planned Community (P-C) (50) zoning classification in the south portion of the Master Plan area. The P-C (50) Zone applies to land in the SRIMP plan area. Development standards and polices include the following: *Uses and/or development standards not specifically addressed in this Master Plan or a subsequent Development Plan as required by the P-C Zone shall be governed by the corresponding zones contained in the Ceres Municipal Code.* *Developments processed independent of a subdivision proposal that are consistent with the master plan and standards in the corresponding zones contained in the Ceres Municipal Code can be processed with an Architectural Site Plan Approval rather than a Development Plan.*
City of Ceres Code of Ordinances	
Title 18, Chapter 18.20 Planned Community (P-C) Zone	The A2PP site is within the P-C (50) Zone, which is an area where land uses are governed by the SRIMP. The purpose of the P-C Zone is to establish a level of preplanning for the development or redevelopment of land and to encourage innovative design solutions while retaining good land use relationships and compatibility of uses (Title 18, § 18.20.020).
Title 18, Section 18.08.120 Property Development Standards in the Community Facilities (C-F) Zone (G. Building Height)	The C-F Zone corresponds to the Community Facility land use classification in the SRIMP (see above). The C-F Zone is intended to accommodate governmental, public utility, public education facilities, and quasi-public medical, cultural, and service facilities. No main building erected in the C-F Zone shall have a height greater than thirty five feet or three stories, whichever is less. No accessory building erected in the C-F Zone shall have a height greater than one story or fifteen feet, whichever is less. Projections above this height may be permitted when approved by the Planning Commission, provided that they may be safely erected and maintained at such height in view of the surrounding conditions and circumstances.

Land Use Table 1 Laws, Ordinances, Regulations, and Standards (LORS)	
Source	**Description of Applicable LORS**
Title 18, Section 18.08.120 Property Development Standards in the C-F Zone (I. Architectural and Site Plan Approval)	Before any building is erected on any lot; a site plan and floor plans of all buildings, elevations of all buildings and a landscape plan shall be submitted to and approved by the Planning Commission pursuant to the provisions of the C-F Zone in Title 18.
Title 18, Section 18.08.080 Conditional Uses in the C-F Zone Title 18, Section 18.50.040 Uses Subject to a Conditional Use Permit (B.8. Public Utility Structures)	The following uses may be permitted in the C-F Zone subject to a conditional use permit as provided for in Chapter 18.50 of Title 18. A. The facilities of all public utilities as defined by the Public Utilities Code of the state; B. The facilities of public utilities incorporated as political entities by the state. Public utility structures may be permitted in any zone except where expressly prohibited, when such uses are deemed by the Planning Commission to be essential or desirable for the public welfare and convenience and in conformity with the General Plan and its goals and objectives.
Title 17, Chapter 17.36 Lot Line Adjustments	A lot line adjustment is any division of land not requiring a map as specified by the Subdivision Map Act, in which no more parcels are created by the division than existed prior to it. The process requires completion of an application and submittal to the City of Ceres for approval.
1994 Stanislaus County General Plan	
Agricultural Element	Goal One of the Agricultural Element is to strengthen the agricultural sector of the county's economy. Objective Number 1.2 addresses supporting the development of agricultural uses while recognizing that a variety of uses, including uses not directly related to agriculture, may be sited on lands that are zoned for agricultural uses.
Stanislaus County Code, Title 21, Zoning	
Section: 21.08.020 General Provisions, Uses (C. Facilities for Public Utilities)	This section of the Stanislaus County Code addresses uses associated with public utilities in areas zoned for agricultural uses: Facilities for public utilities are permitted in the A-2 Zoning District provided that such use is demonstrated in connection with the approval of a use permit. Public utility transmission and distribution lines, both overhead and underground, are permitted in all districts without limitations as to height, but metal transmission towers are subject to all yard requirements as other structures. However, routes of proposed electrical transmission lines (including height, and placement of towers), shall be submitted to the Planning Commission for review and recommendations prior to the acquisition of rights-of-way, when such lines are not within a public street or highway.
Section: 21.20.030 General Agriculture District (A-2), Uses Requiring Use Permit (C. Tier Three)	This section of the Stanislaus County Code addresses permitted uses in the A-2 Zoning District: Public utility development may be allowed (as a Tier 3 use) when the Planning Commission finds that the use as proposed will not 1) be substantially detrimental to or in conflict with the agricultural use of the property or in the vicinity, and 2) be located in one of the County's most productive agricultural areas, as defined by the General Plan and approved by the County. (For areas zoned General Agriculture [A-2], tier 3 includes uses not directly related to agriculture but that may be necessary to serve the A-2 Zoning District or that may be difficult to locate in urban areas.)
City of Modesto Municipal Code, Title 10, Planning and Zoning	

Land Use Table 1 Laws, Ordinances, Regulations, and Standards (LORS)	
Source	**Description of Applicable LORS**
Chapter 2 Zoning Regulations, Article 23 General Provisions, Section 10-2.2304 Utilities and Railroads	The regulations in Article 23 apply in the various zones established by the City of Modesto. With regard to utilities, the following applies: (a) The provisions of this chapter shall not apply to the poles, lines or similar facilities, whether above ground or underground, whose sole purpose is non-wireless transmission of electricity or communications. This exclusion does not apply to the antennas, uni-poles, monopoles, towers, or any similar or related facilities of wireless communication services.

SETTING

INTRODUCTION

The A2PP project would be constructed on approximately 4.6 acres. Of that total, approximately 1.4 acres are part of TID's property where the existing APP is located (Assessor's Parcel Number [APN] 041-006-026). The remaining 3.2 acres includes a vacant TID parcel (APN 041-006-039) adjacent to the north side of the existing APP. The proposed switchyard and the two 115-kV transmission lines for the A2PP would be constructed on land adjacent to the west side of the existing TID parcels, on property that is currently owned by WinCo (APN 041-006-038). Negotiations are proceeding between TID and WinCo relating to the purchase of a portion of the WinCo property; completion of the land purchase from WinCo would expand the acreage of TID's property (APN 041-006-039) to approximately 3.2 acres.

The associated construction laydown areas would be located on approximately 1.85 acres of disturbed land directly north of the A2PP project site. The 1.85-acre area is accessed through the A2PP site. The existing land uses surrounding the project site are industrial, agricultural, and rural residential. The proposed A2PP is located within the southwest boundary of the Ceres city limits, approximately 2 miles from the city center (Land Use Figure 1).

The City of Ceres General Plan governs land uses in its planning area. The designated land use for the A2PP project site is General Industrial (GI). The 1.4-acre portion of the existing APP property where some of the A2PP facilities would be located, including one of the 58-megawatt (MW) turbines, is designated Community Facilities (CF) (Land Use Figure 2) (TID 2009a, City of Ceres 1997).

The proposed 115-kV electrical transmission lines and natural gas supply pipelines would be located on land that is designated General Industrial and Industrial Reserve by the City of Ceres and Agriculture by Stanislaus County. The reconductoring 69-kV sub-transmission line route is on land designated Industrial and Residential by the City of Modesto; and Light Industrial, General Industrial, Community Facilities, and Low-Density Residential by the City of Ceres (TID 2009a, City of Ceres 1997, Stanislaus County 1994, City of Modesto 2008).

SPECIAL DISTRICTS

TID operates under the provisions of the California Water Code as a special district. A special district is defined by state law as “any agency of the state for the local performance of governmental or proprietary functions within limited boundaries.” (Gov. Code § 16271) In other words, a special district is a separate local government that delivers public services to a particular area. “District” means any irrigation district formed pursuant to any law of this State or to this division….” (Wat. Code § 20513) It is also established that “districts are state agencies formed and existing for governmental purposes.” (Wat. Code § 20570) Case law has established that districts are also considered local agencies.

The Government Code provides that certain district facilities are exempt from city and county building and zoning ordinances:

> *Building ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency (Gov. Code § 53091[d]).*
>
> *Zoning ordinances of a county or city shall not apply to the location or construction of facilities for the production, generation, storage, treatment, or transmission of water, or for the production or generation of electrical energy, facilities that are subject to Section 12808.5 of the Public Utilities Code, or electrical substations in an electrical transmission system that receives electricity at less than 100,000 volts. Zoning ordinances of a county or city shall apply to the location or construction of facilities for the storage or transmission of electrical energy by a local agency, if the zoning ordinances make provision for those facilities (Gov. Code § 53091[e]).*

A district has a legal obligation to ensure provision of reliable water and energy services; therefore, a district is exempt from compliance with city and county building and zoning ordinances for facilities that are connected and integral to the provision of water and energy services.

GENERAL PLAN LAND USE DESIGNATIONS AND ZONING WITHIN 1 MILE OF THE PROJECT STUDY AREA

The City of Ceres General Plan land use designations for the1.4-acre portion of the existing APP facility is designated Community Facilities (CF), and the area for the proposed A2PP facility as well as the construction laydown and the switchyard areas are designated General Industrial (GI) (Land Use Figure 2).

The A2PP site and construction areas are in an area that is governed by the Service Road Industrial Master Plan (SRIMP), which provides the conceptual framework for the installation of public facilities, provision of public services, and future development of the approximately 320-acre area that is bounded by Morgan Road on the east, TID Lateral No. 2 on the south, Crows Landing Road on the west, and Service Road on the north. The SRIMP was prezoned in 1990 to Planned Community (P-C). The SRIMP specifies community facilities, wholesale and community commercial, and light and general industrial as allowable uses within its plan area (City of Ceres 1996).

Uses and/or development standards not specifically addressed in one of the City's master plan areas are addressed by the corresponding zones contained in the Ceres Zoning Ordinance. The A2PP site and construction areas are within the P-C-50 Zone, which applies to the area encompassed by the SRIMP. Project facilities for the A2PP would be located on land having two corresponding zoning districts established by the Ceres Zoning Ordinance. The1.4-acre portion of the existing APP facility is in the Community Facilities (C-F) Zone. The General Industrial (M-2) Zone applies to the area for the A2PP facility and the construction parking and laydown area (Land Use Figure 3).

The 115-kV transmission lines and natural gas line would be constructed in the Stanislaus County planning area. The County's General Plan land use designation for this area is Agriculture, and the zoning district is General Agriculture (A-2-40). The reconductored 69-kV transmission lines would be constructed in the City of Modesto planning area. The City's General Plan land use designation for this part of the project area is Industrial. The zoning classifications are primarily Heavy Industrial (M-2) and Low-Density Residential (R-1) (TID 2009a) (Land Use Figure 2).

Land Use Figures 2 and 3 show the general plan and zoning designations in the project study area, including a portion of the transmission line corridors.

Power Plant and Construction Laydown Area

The A2PP is a nominal 174-MW, natural gas-fired, simple-cycle peaking plant and switchyard that is proposed for construction directly north of TID's existing 48-MW Almond Power Plant (APP). The Application for Certification (AFC) for the A2PP describes the existing APP facilities that would be shared with the proposed project; modifications would be required to accommodate sharing of these facilities (TID 2009a). A new stormwater retention pond would be constructed to accommodate stormwater runoff for both the existing APP and the A2PP on the property for the new plant site (TID 2009a). The switchyard would be constructed along the west side of the plant site. The construction laydown area would be on 1.85 acres of WinCo property to the north (Land Use Figure 1).

The proposed A2PP would include construction of three 80-foot-tall turbines and associated equipment. Some of the new facilities for the A2PP would be located within the 1.4-acre portion of TID's existing power plant (APN 041-006-026), including one of the new turbines. Most of the facilities for the new plant would be constructed on the vacant parcel (APN 041-006-039) adjacent to the north side of the existing plant.

Linear Facilities

Electrical Transmission Poles and Lines

Linear routes for the project would include two 115-kV transmission lines (Corridor 1 is 0.9 mile long and Corridor 2 is 1.2 miles long) interconnecting to the proposed Grayson Substation[1] located approximately 3,300 feet southwest of the A2PP project site. A

[1]The proposed Grayson Substation referenced above is a component of TID Hughson-Grayson 115-kV Transmission Line and Substation Project (the "Hughson-Grayson Project"). A Draft Environmental Impact Report was published August 10, 2009 for the TID Hughson-Grayson Project.

portion of Corridor 2 would be routed along Crows Landing Road. Land use planning documents for Ceres and Stanislaus County have addressed improving several segments of Crows Landing Road, including a segment that is north of Keyes Road in the A2PP project area. Although these planned roadway improvements could be implemented in the future, Stanislaus County staff has confirmed that all planned improvements to Crows Landing Road have been delayed indefinitely for lack of funding (TID 2010).

The reconductoring of an existing 69-kV sub-transmission line would involve hanging travelers on the insulators of the existing line and using the existing conductor as a pull line for the new conductor. Digital communication for differential protection between substations would be provided through fiber optic communication cable, which would be attached to the poles on Corridor 1.

Natural Gas Supply

A new natural gas supply pipeline is proposed to connect with the existing high pressure Pacific Gas and Electric Company (PG&E) natural gas line #215, approximately 11.6 miles from the A2PP project site (TID 2009b). The construction right-of-way within the corridor would be 85 feet wide and the permanent pipeline easement would be 50 feet wide.

Water and Water Treatment and Storage

The A2PP would share service water by tying into the existing onsite water well located in the southeast corner of the existing APP site. Drinking water would be provided by an outside drinking water delivery service. Fire water would tie into the existing APP fire system. The A2PP project would receive process water that is currently delivered to the site by a 6-inch-diameter pipeline between the existing APP and the City of Ceres Wastewater Treatment Plant.

For a detailed description of the components and associated facilities for the A2PP, see the “Project Description” section of this document.

AGRICULTURAL LAND IN THE PROJECT AREA

The Farmland Mapping and Monitoring Program (FMMP) of the California Department of Conservation (DOC) provide statistics on conversion of farmland to nonagricultural uses for Stanislaus County. Energy Commission staff has reviewed the Stanislaus County 2006 Important Farmland mapping by the FMMP. The mapping indicates that the proposed project site and laydown areas are within an area classified as Urban and Built-up Land. The transmission poles and lines would be located within areas classified as Prime Farmland and Rural (Rural is included in Other Land) (TID 2009a). The Preferred Alignment for the natural gas line would cross or be adjacent to lands classified as Prime Farmland, and would cross several parcels that are held under Williamson Act contracts (TID 2009b).

Lands are divided and mapped into farmland categories and other categories based on their suitability for agricultural use. Some of these categories are listed below:

Prime Farmland: Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields.

Urban and Built-up Land: This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

Other Land: Land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres.

Unique Farmland: Land which does not meet the criteria for Prime Farmland or Farmland of Statewide Importance that has been used for the production of specific high economic value crops at some time during the two update cycles prior to the mapping date. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to current farming methods. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use.

Farmland of Local Importance: Land that is either currently producing crops, has the capability of production, or is used for the production of confined livestock. Farmland of Local Importance is land other than Prime Farmland, Farmland of Statewide Importance or Unique Farmland. This land may be important to the local economy due to its productivity or value. It does not include publicly owned lands for which there is an adopted policy preventing agricultural use. This land includes soils which qualify for Prime Farmland or Farmland of Statewide Importance, but generally are not cultivated or irrigated.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Energy Commission staff has analyzed information provided by TID for the proposed A2PP to determine consistency of the proposed project with applicable land use LORS. The analysis addresses the potential for the A2PP to cause significant adverse impacts to land use and agricultural resources.

METHOD AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Significance criteria used in this document are based on Appendix G of the State CEQA Guidelines and performance standards or thresholds identified by Energy Commission staff. An impact may be considered significant if the proposed project would result in:

- Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use.

- Conflicts with existing zoning for agricultural use or a Williamson Act contract.
- Other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to nonagricultural use.
- Physical disruption or division of an established community.
- Conflicts with any applicable habitat conservation plan or natural community conservation plan.
- Conflicts with any applicable land use plan, policy, or regulation of an agency with jurisdiction, or that would normally have jurisdiction, over the project. This includes, but is not limited to, a General Plan, redevelopment plan, or zoning ordinance.
- Environmental effects that are individually limited but cumulatively considerable. ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).

DIRECT AND INDIRECT IMPACTS AND MITIGATION

Power Plant Site and Associated Facilities

The City of Ceres Annexation Policy was adopted for the area-wide planning of the SRIMP in the City's 1997 General Plan. The SRIMP provides the conceptual framework for future development areas surrounding and encompassing the proposed project. The planning area was designated mostly for industrial development with some commercial and community facility uses. Today, the SRIMP plan area consists of agricultural and rural residential uses, and industrial uses, including TID's existing APP substation and energy facility.

The proposed project would be erected on a site that was formerly used by WinCo as a borrow pit during construction of the adjacent WinCo distribution center (TID 2009a). The proposed A2PP would not physically disrupt or divide an established community. The site is located within an established industrial area in Ceres, and it is adjacent to TID's existing APP facility. The new power plant would be located entirely on private property. No new physical barriers would be created by the project (public access across the site is not currently allowed), and no existing roadways or pathways would be blocked. Given its location, the project would not alter existing land use patterns in the area.

The proposed project represents further development of a site already committed to industrial use and, therefore, would not introduce a new industrial use into a non-industrial area.

The linear facilities for the proposed project would be erected within existing transmission corridors and utility rights-of-way within industrial, agricultural and rural residential areas. The nature of these facilities would not result in the physical division of an established community nor would any physical barriers be created. There would be no alteration of the existing land uses in these areas.

No habitat conservation or natural community conservation plans are in effect that would apply to the project area, and the project would not conflict with any such plans.

Conversion of Farmland

Based on FMMP mapping of farmland and land use data, the proposed project site and the switchyard and construction laydown areas are classified as Urban and Built-up Land. There would be no significant impacts to Important Farmland within the A2PP project site. Following project construction, the construction laydown area would be restored to its pre-construction land use condition.

The A2PP facilities for the proposed 115-kV electrical transmission poles and lines in Corridor 1 would be installed within an existing TID right-of-way and would cross or be adjacent to lands classified as Prime Farmland by the FMMP. Construction could result in minor and temporary disruptions to agricultural uses within areas outside of the TID right-of-way and access roads. Transmission poles and lines for Corridor 2 would be placed within county road or TID rights-of-way or along agricultural access roads.

The Stanislaus County General Plan requires mitigation to compensate for the loss of farmland resulting from residential development in the unincorporated areas of the county. The Stanislaus County Farmland Mitigation Program Guidelines applies to any development project requiring a general plan or community plan amendment from Agriculture to a residential land use designation (Stanislaus County 1994). The construction of one pole in Corridor 2 would result in the loss of approximately 4 sq. ft. of Prime Farmland. Implementation of the A2PP would not convert agricultural land to a residential land use designation, therefore, the mitigation requirements are not applicable to the loss of the 4 sq. ft. of Prime Farmland associated with construction of the utility pole in Corridor 2.

Based on data compiled by the FMMP, acreages of Important Farmland converted to other uses in Stanislaus County averaged approximately 620 acres per year from 1984 to 2000 (DOC 2007). (Important Farmland includes Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance.) Based on the most recent FMMP data, a total of approximately 1,500 acres of Important Farmland in the county were converted to Urban and Built-up Land from 2004 to 2006. The State CEQA Guidelines defines “significant effect on the environment” as “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project….” (State CEQA Guidelines § 15382) The loss of 4 sq. ft. of Prime Farmland relating to installation of one utility pole for the Corridor 2 transmission line is not considered substantial relative to the total acreage of Important Farmland that is converted annually in the county, generally from implementation of various types of development projects.

The reconductored 69-kV sub-transmission line would not require ground disturbance, therefore, parcels within and outside of the transmission line right-of-way would not be impacted.

The natural gas pipeline for the A2PP would be installed in a 6- to 8-foot-deep trench along an approximately 11.6-mile route (TID 2009b). Segments of the gas pipeline would be located on land that is primarily classified as Prime Farmland and portions of

several parcels that are held under Williamson Act contracts. PG&E would own and operate the natural gas pipeline. The pipeline installation would not compromise the long-term productivity of the agricultural uses along the pipeline alignment. The use would not result in a significant removal of adjacent contracted land from agricultural uses. For these reasons, Energy Commission staff finds the proposed project's gas pipeline will not result in a significant impact to those parcels under Williamson Act contracts and other agricultural lands.

The Williamson Act addresses uses that are considered compatible in areas that are identified as agricultural preserves and on contracted lands. Construction and maintenance of various utilities are identified as compatible uses in areas identified as agricultural preserves (Gov. Code § 51238). The Williamson Act also establishes principles of compatibility on contracted lands. Approved uses may not compromise long-term productivity or displace or impair current or reasonably foreseeable agricultural operations (Gov. Code § 51238.1).

Installation of the natural gas pipeline could cause temporary construction-related impacts to Important Farmland and Williamson Act contracted lands. The applicant proposes mitigation measures to restore the surface of the ground by removing any construction debris, grading to the original grade and contour, and revegetating disturbed areas as required (TID 2009b). Conditions of certification are proposed in this staff assessment (SA) to address temporary effects to biological resources during construction of the natural gas pipeline for the A2PP project (see conditions of certification **BIO-6** and **BIO-14** in this SA). Condition of certification **LAND-2** is proposed to ensure that agricultural lands are restored to their pre-project condition for all areas that are disturbed during construction of the natural gas pipeline. With implementation of condition of certification **LAND-2**, Energy Commission staff finds the project would have less-than-significant impacts on Important Farmland and Williamson Act contracted lands.

Compliance with Laws, Ordinances, Regulations, and Standards

In accordance with applicable codes and regulations, Energy Commission staff has evaluated the information provided by the applicant in the AFC to determine if elements of the proposed project would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, or that would normally have jurisdiction over the project except for the Energy Commission's exclusive authority to license power plants in the state with a generating capacity of 50 MW or greater (20 Cal. Code Regs. § 1744; Pub. Resources Code §§ 25500–25543). The Energy Commission's license takes the place of other state, regional, and local permits (e.g., conditional use permits and variances) and other entitlements that would otherwise be required. The Energy Commission's licensing process includes preparation of findings regarding the conformity of the proposed facility with applicable local, regional, state, and federal standards, ordinances, and laws (Pub. Resources Code § 25523 [d][1]). A determination of noncompliance requires the Energy Commission to consult with the agencies responsible for implementation of identified ordinances or regulations to attempt to correct or eliminate the noncompliant condition.

As discussed above, most of the A2PP would be sited in an area that is designated as GI in the City of Ceres General Plan. The designation of GI allows for a wide range of industrial and manufacturing uses. The 1.4-acre portion of the existing APP property where some of the A2PP facilities would be sited is designated as CF, which applies to Ceres's major public and private facilities and institutional uses, including the existing APP. A power plant is considered an allowable use in areas with each of these general plan land use designations. The proposed A2PP site has a SRIMP land use classification of General Industrial (M-2), and the portion of the existing APP facility is classified as Community Facilities (C-F). The C-F classification applies to a total of 6 acres within the SRIMP plan area where TID facilities are currently sited, including the existing APP. The proposed A2PP is appropriately sited in an area designated for general industrial and public utility development and is proposed to be adjacent to TID's existing APP facility. Energy Commission staff has concluded that the proposed project does not conflict with the City's General Plan land use designations and applicable land use policies.

The proposed A2PP would include construction of three 80-foot-tall turbines and associated equipment. Some of the new facilities for the A2PP would be located on the existing APP property, including one of the new turbines. The City of Ceres Code of Ordinances, the C-F Zone applies to areas with the corresponding land use designation of CF. The property development standards for the C-F Zone address building height requirements, which limit main buildings to a height of 35 feet. The existing APP includes a 92-foot-tall exhaust stack. The City's approval process to allow construction of structures exceeding the height limit would typically occur as part of its Architectural and Site Plan Approval (ASPA) process. The California Government Code provides that certain district facilities are exempt from city and county building and zoning ordinances. Exempt facilities include those that are necessary for the production or generation of electrical energy (Gov. Code § 53091[e]). Because TID operates under the provisions of the California Water Code as a special district, it is exempt from the City of Ceres's zoning ordinance, including the property development standards for development in the C-F Zone.

Some of the new facilities for the A2PP would be located within the 1.4-acre portion of TID's existing power plant (APN 041-006-026) (Land Use Figure 4). Most of the equipment and facilities for the A2PP would be constructed on an adjacent vacant parcel (APN 041-006-039). TID owns both parcels. The 115-kV switchyard and associated transmission lines would be installed along the west side of TID's properties. As discussed above, TID is planning to purchase a portion of the WinCo property; execution of this agreement would result in a total area of 4.6 acres for the proposed A2PP.

Energy Commission staff has determined that the project would be consistent with the applicable LORS upon the applicant providing documentation demonstrating that the A2PP would be constructed and operated on a legal parcel of land. Condition of certification **LAND-1** is proposed to require the project applicant to complete a lot line adjustment and record of survey for filing with the City of Ceres and Stanislaus County. Completing the required actions to move the property boundaries at the plant site would enable construction and operation the A2PP on a legal parcel of land.

Installation of the new 115-kV transmission lines would occur primarily within rights-of-way and along existing agricultural access roads, however, construction of one pole in Corridor 2 would result in the loss of approximately 4 sq. ft. of Prime Farmland. The Stanislaus County General Plan requires mitigation to compensate for the loss of farmland resulting from residential development in the unincorporated areas of the county. Because the A2PP would not convert agricultural land to residential uses, no mitigation is required to compensate for this loss of Prime Farmland acreage. The proposed project would not cause any additional conversion of Important Farmland to nonagricultural uses.

A portion of Corridor 2 would be routed along Crows Landing Road. This segment of the 115-kV transmission line would be installed 55 feet from the roadway centerline. Although Stanislaus County and the City of Ceres plan to widen Crows Landing Road between Service Road and State Route 33, implementation of roadway improvements has been delayed indefinitely because no funding sources have been identified for the proposed improvements (TID 2010). Because of the uncertainty of plans for the possible future widening of Crows Landing Road, no conflict would occur with any land use plan relating to placement of the Corridor 2 transmission line along the roadway.

No general plan or zoning inconsistencies would occur relating to reconductoring of the existing 69-kV sub-transmission line. The proposed project's linear utility facilities would be consistent uses within existing transmission line corridors and easements.

Land Use Table 2 Project Compliance with Adopted Applicable Land Use LORS		
Source	**Consistency Determination**	**Basis for Consistency**
State		
Professional Land Surveyors' Act (Business and Professions Code commencing with § 8700)	Consistent, with implementation of **LAND-1** (see below)	The project applicant will be required to comply with the Professional Land Surveyors' Act for completion of a record of survey and lot line adjustment to ensure construction and operation of the A2PP on a legal parcel of land.
Subdivision Map Act (Government Code commencing with § 66410)	Consistent, with implementation of **LAND-1** (see below)	The project applicant will be required to comply with the Subdivision Map Act for completion of a record of survey and lot line adjustment to ensure construction and operation of the A2PP on a legal parcel of land.
California Land Conservation Act of 1965 (Williamson Act) (Gov. Code commencing with § 51200)	Consistent, with implementation of **LAND-2** (see below)	The natural gas pipeline for the A2PP would cross portions of parcels that are held under Williamson Act contracts. The A2PP project is considered consistent with Williamson Act objectives and principles of compatibility. However, installation of the gas pipeline could cause temporary construction-related impacts to Williamson Act lands. Returning affected Williamson Act contracted lands and agricultural preserves areas to pre-project conditions would ensure that the long-term productivity of these lands is not affected.
Local		
City of Ceres General Plan		

Land Use Table 2 Project Compliance with Adopted Applicable Land Use LORS		
Source	**Consistency Determination**	**Basis for Consistency**
Land Use and Community Design Element	Consistent	The City of Ceres General Plan land use designations for the A2PP site are General Industrial (GI) and Community Facility (CF). Most of the A2PP site is within an area that is designated GI. A portion of the A2PP would be constructed adjacent to the existing APP within an area that is designated CF. The GI designation allows for a wide range of industrial uses, and the CF designation is applied to the city's major public and private facilities and institutional uses, including the APP. The A2PP is considered to be consistent with the City's intent for development projects in each of these designated land use categories. No conflict or inconsistency with the General Plan would occur from implementation of the A2PP project.
Public Facilities and Services Element, Goal 4.L	Consistent	The A2PP would provide needed electric generation capacity with improved efficiency and operational flexibility. It would provide additional generation to meet the demands of customers within TID's service territory. Corridor 2 would be equipped with future cross arms to allow for a future 12-kV distribution line, which would minimize negative impacts of retrofitting the poles in the future. Potential impacts relating to implementation of the A2PP are evaluated for the full range of environmental resource sections addressed in this staff assessment. Compliance with Goal 4.L would be achieved with implementation of conditions of certification for the identified impacts.
City of Ceres Service Road Industrial Master Plan (SRIMP)		
Development Plan Approval, Land Use Classifications, and Development Standards	Consistent	Land use classifications specified in the SRIMP for this area are consistent with the corresponding City of Ceres General Plan land designations. In the SRIMP, the Community Facility (C-F) classification corresponds to the CF land use designation in the General Plan, and the General Industrial (M-2) classification corresponds to the GI land use designation. As discussed above, no conflict or inconsistency with the City of Ceres General Plan would occur from implementation of the A2PP project. The A2PP is considered to be consistent with the City's intent for development projects in the City's planning area for the SRIMP.
City of Ceres Code of Ordinances		
Title 18, Chapter 18.20 Planned Community (P-C) Zone	Consistent	As discussed above, the P-C (50) Zone applies to land in the SRIMP plan area. The A2PP is consistent with the City of Ceres General Plan land use designations and the corresponding land use classifications in the SRIMP. Construction and operation of the A2PP is consistent with other uses within the P-C (50) Zone. No conflict or inconsistency with the SRIMP would occur from implementation of the A2PP project.

Land Use Table 2 Project Compliance with Adopted Applicable Land Use LORS		
Source	**Consistency Determination**	**Basis for Consistency**
Title 18, Section 18.08.120 Property Development Standards in the Community Facilities (C-F) Zone (G. Building Height)	Consistent	Construction of the A2PP project would include installation of three 80-foot-tall stacks. Based on the existing General Plan land use designations and corresponding zoning at the project site, one of the turbines would be constructed in the C-F Zone where the height of main buildings is limited to 35 feet. The existing APP, which includes a 92-foot-tall exhaust stack, is located adjacent to the A2PP site in the C-F Zone. Construction of the A2PP is considered consistent with the City's intent relating to planned and approved land uses in the C-F Zone. The City of Ceres's approval process to allow construction of structures exceeding the height limit specified for the C-F Zone would typically occur as part of its Architectural and Site Plan Approval (ASPA) process. California law provides that certain district facilities are exempt from city and county building and zoning ordinances. Exempt facilities include those that are necessary for the production or generation of electrical energy (Gov. Code § 53091[e]). Because TID operates under the provisions of the California Water Code as a special district, it is exempt from the City's zoning ordinance, including the property development standards for development in the C-F Zone.
Title 18, Section 18.08.120 Property Development Standards in the C-F Zone (I. Architectural and Site Plan Approval)	Consistent	As discussed above, the existing APP is located adjacent to the A2PP site in the C-F Zone. Construction of the A2PP is considered consistent with the City's intent relating to planned and approved land uses in the C-F Zone. The City of Ceres's approval process to allow construction of structures in the C-F Zone would typically occur as part of its ASPA process. California law provides that certain district facilities are exempt from city and county building and zoning ordinances. Exempt facilities include those that are necessary for the production or generation of electrical energy (Gov. Code § 53091[e]). Because TID operates under the provisions of the California Water Code as a special district, it is exempt from provisions of the City's ASPA process.
Title 18, Section 18.08.080 Conditional Uses in the C-F Zone Title 18, Section 18.50.040 Uses Subject to a Conditional Use Permit (B.8. Public Utility Structures)	Consistent	Construction of the A2PP is considered consistent with the City's intent relating to planned and approved land uses in the C-F Zone. Public utilities are consistent with the City's purpose and intent for development projects in the C-F Zone (Title 18, § 18.08.020). The Energy Commission has the exclusive authority to license power plants in the state with a generating capacity of 50 MW or greater; therefore, all required local approvals and entitlements for the proposed A2PP, including a conditional use permit, would be covered under the Energy Commission's in-lieu permitting authority.

Land Use Table 2 Project Compliance with Adopted Applicable Land Use LORS		
Source	**Consistency Determination**	**Basis for Consistency**
Title 17, Chapter 17.36 Lot Line Adjustments	Consistent, with implementation of **LAND-1** (see below)	The project applicant will be required to comply with the City's approval process for completion of a record of survey and lot line adjustment to ensure construction and operation of the A2PP on a legal parcel of land.
1994 Stanislaus County General Plan		
Agricultural Element	Consistent	Objective Number 1.2 addresses development in the Stanislaus County A-2 Zoning District. Tier three includes uses that are not directly related to agriculture but may be necessary to serve the A-2 Zoning District or difficult to locate in urban areas. Segments of the 115-kV transmission lines and natural gas line for the A2PP project are located in the County's A-2 Zoning District, in an area that is designated as Agriculture in the County's General Plan. The A2PP is considered to be consistent with the County's intent relating to planned and approved land uses in the A-2 Zoning District. No conflict or inconsistency with the General Plan would occur from implementation of the A2PP project.
Stanislaus County Code, Title 21, Zoning		
Section: 21.08.020 General Provisions, Uses (C. Facilities for Public Utilities)	Consistent	Installation of the 115-kV transmission lines and natural gas line for the A2PP project is considered consistent with the County's intent relating to planned and approved land uses in the A-2 Zoning District. Facilities for public utilities are consistent with the City's purpose and intent for development projects in the A-2 Zoning District. The Energy Commission has the exclusive authority to license power plants in the state with a generating capacity of 50 MW or greater; therefore, all required local approvals and entitlements for the proposed A2PP, including approval of a use permit, would be covered under the Energy Commission's in-lieu permitting authority.
Section: 21.20.030 General Agriculture District (A-2), Uses Requiring Use Permit (C. Tier Three)	Consistent	As discussed above, facilities for public utilities are consistent with the City's purpose and intent for development projects in the A-2 Zoning District. The Energy Commission has the exclusive authority to license power plants in the state with a generating capacity of 50 MW or greater; therefore, all required local approvals and entitlements for the proposed A2PP, including approval of a use permit, would be covered under the Energy Commission's in-lieu permitting authority.
City of Modesto Municipal Code, Title 10, Planning and Zoning		
Chapter 2 Zoning Regulations, Article 23 General Provisions, Section 10-2.2304 Utilities and Railroads	Consistent	Segments of the reconductored 69-kV transmission lines would be in an area that is primarily zoned for heavy industrial and low-density residential uses. The transmission lines for the A2PP are considered to be consistent with the County's zoning regulations for uses in these zoning districts.

CUMULATIVE IMPACTS

Cumulative impacts are defined as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” A cumulative impact occurs from “the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.” Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.” (State CEQA Guidelines § 15355)

Impacts involving land use plans or policies and zoning generally will not combine to result in cumulative impacts. The determination of significance for impacts relating to these issues, as considered in Appendix G of the State CEQA Guidelines, is whether a project will conflict with any applicable land use plan or policy adopted for the purpose of reducing or avoiding environmental impacts. Such a conflict is site-specific and would be addressed on a project-by-project basis. As discussed in this land use analysis, implementing A2PP would not result in significant land use planning impacts, and the project’s ultimate consistency with applicable LORS would be ensured through implementation of conditions of certification **LAND-1** and **LAND-2**.

The A2PP’s impacts relating to land use are site-specific and would not combine with other related projects to compound or increase an environmental effect. The A2PP’s contribution to impacts on land use consistency would not result in significant cumulative impacts, and it would not otherwise contribute to impacts on this resource area.

As discussed above, the construction of one utility pole in Corridor 2 would result in the loss of approximately 4 sq. ft. of Prime Farmland. This relatively minor conversion of Prime Farmland is not comparable to other conversions of Important Farmland in the county to residential and other urban uses. Installation of the one utility pole would not contribute considerably to the significant future cumulative condition relating to the net loss of Important Farmland.

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission staff has reviewed the AFC and other information provided by the applicant and evaluated whether the A2PP would cause impacts relating to land use planning and agricultural resources. Staff recommends implementation of condition of certification **LAND-1** to ensure construction and operation of the A2PP on a legal parcel of land. Implementation of **LAND-2** is recommended to ensure that temporary construction-related impacts to Important Farmland and Williamson Act lands are reduced to a less-than-significant level. With implementation of conditions of certification **LAND-1** and **LAND-2**, the project would comply with all applicable LORS, and no significant impacts to land use and agricultural resources would occur from implementation of the A2PP. This analysis was conducted in accordance with CEQA (Pub. Resources Code § 21000 et seq.) and the State CEQA Guidelines (14 Cal. Code Regs. § 15000 et seq.).

PROPOSED CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall complete a lot line adjustment and record of survey for filing with the City of Ceres and Stanislaus County to ensure construction and operation of the Almond 2 Power Plant on a legal parcel of land. The record of survey shall be filed by a licensed land surveyor or registered civil engineer authorized to practice land surveying. Survey methods, practices, and monumentation shall comply with the Subdivision Map Act and the Professional Land Surveyors Act. All documentation and submittals shall be completed to the satisfaction of the Director of the City of Ceres Development Services Department, Planning Division; the City Engineer for the City of Ceres; and the County Surveyor for the Stanislaus County Public Works Department, Survey Division.

Verification: Prior to commercial operation of the Almond 2 Power Plant, the project owner shall provide written documentation to the Compliance Project Manager (CPM) that all necessary actions and approvals relating to the lot line adjustment and record of survey have been completed and finalized. Written documentation submitted to the CPM shall include copies of all approved and recorded documents relating to the lot line adjustment and record of survey.

LAND-2 The project owner shall ensure restoration of certain agricultural lands that are disturbed during project construction. Any lands that are identified by the Farmland Mapping and Monitoring Program as Important Farmland or located within agricultural preserves shall be restored to pre-project conditions. Methods to restore affected agricultural lands shall include stock piling of top soil for replacement when project construction is completed. Restoration shall be considered complete when affected sites are graded and prepared for cultivation and top soil replacement is accomplished to match the conditions that were present prior to disturbance of affected farmlands.

Verification: Before the start of any project construction work on agricultural lands, the project owner shall submit written documentation to the Compliance Project Manager (CPM) describing methods that will be used to return the affected lands to pre-project conditions. Within 90 days of completion of construction of the Almond 2 Power Plant and related facilities, the project owner shall provide written documentation to the Compliance Project Manager (CPM) demonstrating that all necessary work to restore disturbed agricultural lands to pre-project conditions has been completed. Written documentation shall include detailed descriptions of restoration methods and corresponding maps for affected areas.

REFERENCES

California Department of Conservation 2007—*Division of Land Resource Protection, Stanislaus County Important Farmland Data Availability*, copyright © 2007, last edited December 17, 2009, http://redirect.conservation.ca.gov/DLRP/fmmp/county_info_results.asp. Accessed April 19, 2010.

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City of *Modesto* 2008—*Final Urban Area General Plan*. Adopted October 14, 2008. http://www.modestogov.com/ced/documents/planning_general-plan-meir.asp. Accessed April 2010.

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TID. *See* Turlock Irrigation District.

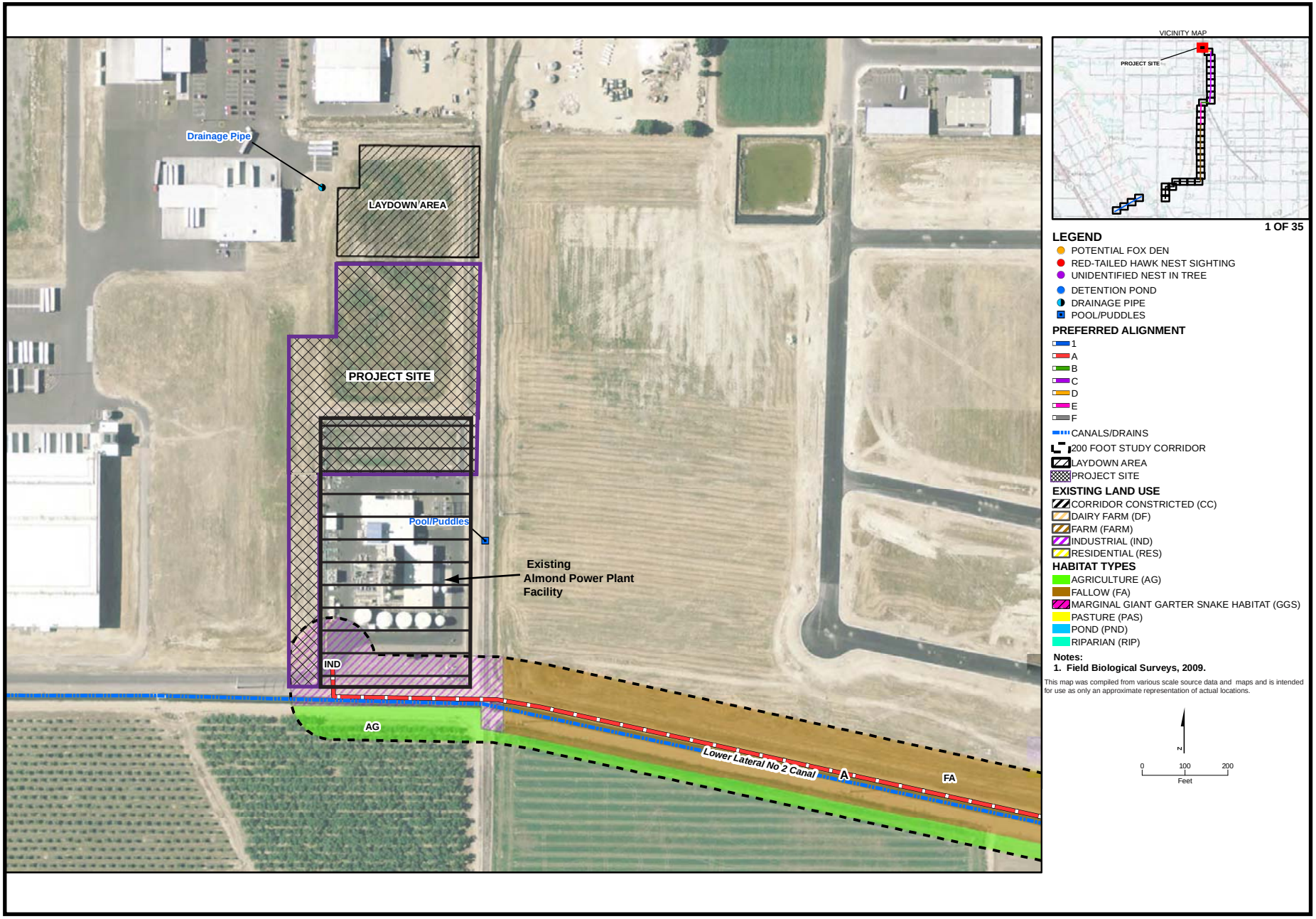
Turlock *Irrigation* District 2009a—*TID Almond 2 Power Plant, Application for Certification (02-AFC-02)*, submitted by Turlock Irrigation District, submitted to the California Energy Commission, with technical assistance from CH2M HILL, May 2009.

Turlock Irrigation District 2009b—*TID Almond 2 Power Plant, Data Responses, Set 1D (Response to Data Requests 18 and 77 through 79) (02-AFC-02)*, submitted by Turlock Irrigation District, submitted to the California Energy Commission, with technical assistance from CH2M HILL, November 2009.

Turlock Irrigation District 2010—*TID Almond 2 Power Plant, Staff Queries, Set 3 (Responses to Staff Query 4) (02-AFC-02)*, submitted by Turlock Irrigation District, *submitted* to the California Energy Commission, with technical assistance from CH2M HILL, April 2010.

LAND USE - FIGURE 1

Almond 2 Power Plant Project - Project Location



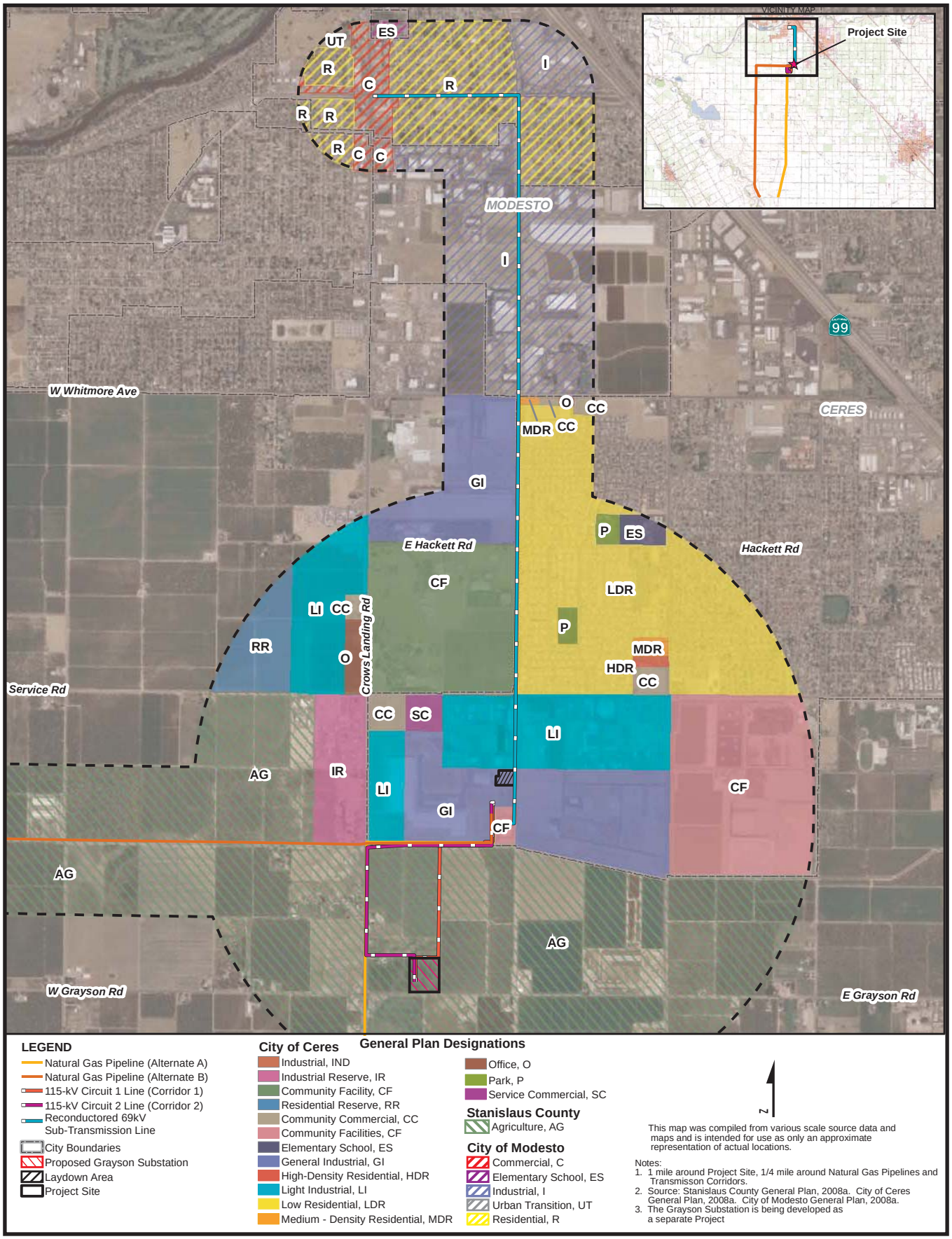
LAND USE

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Data Response 1-D, Figure 3-1

LAND USE - FIGURE 2

Almond 2 Power Plant Project - General Plan Designations

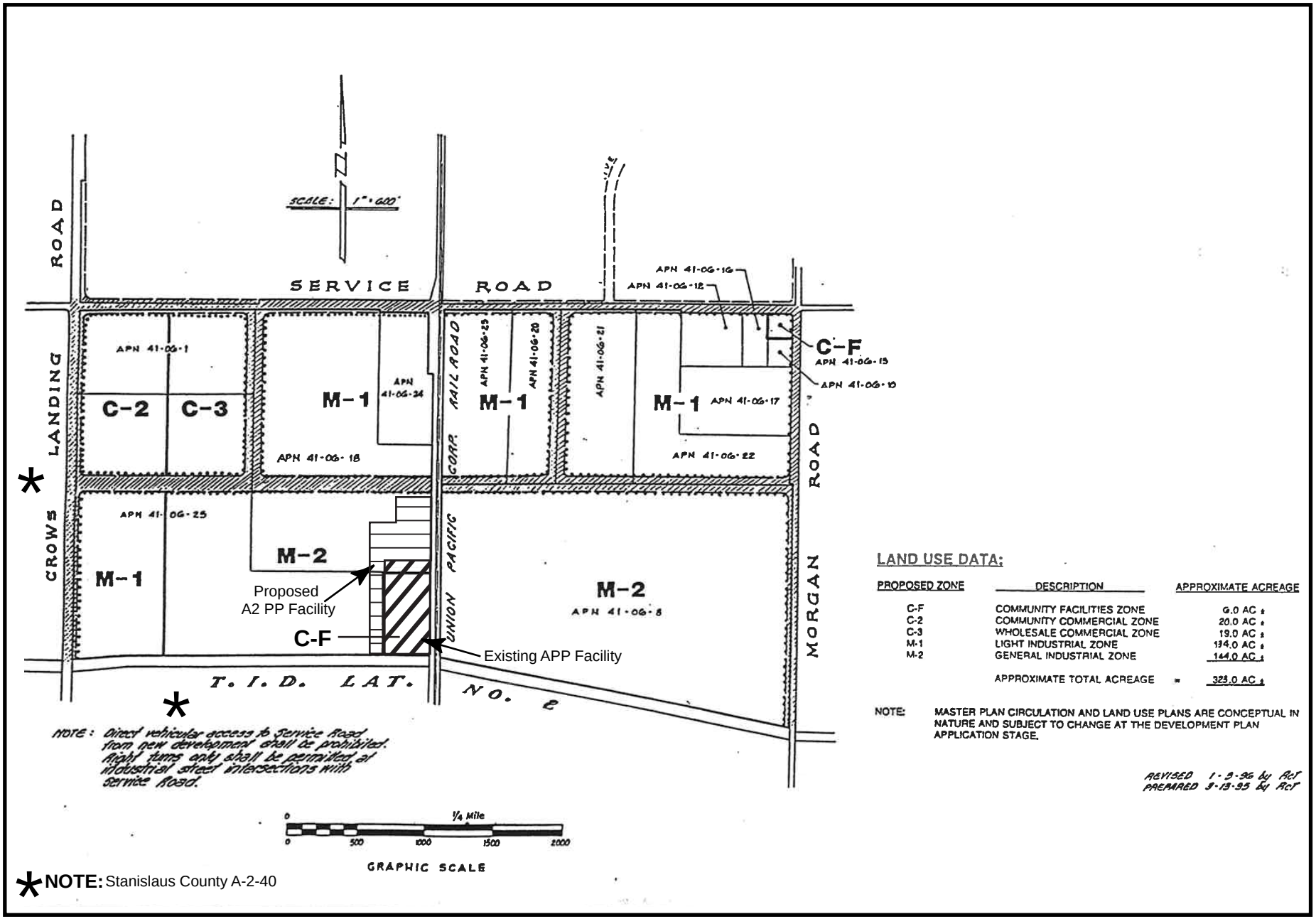


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 5.6-3A

LAND USE - FIGURE 3

Almond 2 Power Plant Project - Zoning District Designations



*NOTE: Stanislaus County A-2-40

LAND USE

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Service Road Industrial Conceptual Master Plan- Figure 4

NOISE AND VIBRATION

Testimony of Erin Bright

SUMMARY OF CONCLUSIONS

California Energy Commission staff concludes that the Turlock Irrigation District (TID) Almond 2 Power Plant (A2PP) can be built and operated in compliance with all applicable noise and vibration laws, ordinances, regulations, and standards and, if built in accordance with the conditions of certification proposed below, would produce no significant adverse noise impacts on people within the affected area, either direct, indirect, or cumulative.

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 groundborne 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 A2PP 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) and to avoid creation of significant adverse noise or vibration impacts. For an explanation of technical terms and acronyms employed in this section, please refer to **NOISE Appendix A** immediately following.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Noise Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal (OSHA): 29 U.S.C. § 651 et seq.	Protects workers from the effects of occupational noise exposure.
State (Cal/OSHA): Cal. Code Regs., tit. 8, §§ 5095–5099	Protects workers from the effects of occupational noise exposure.
Local	
Stanislaus County General Plan, Noise Element	Establishes acceptable noise levels.
Stanislaus County Ordinance Code (Title 10, Chapter 10.46)	Prohibits noisy steam blows.
City of Ceres General Plan, Noise Element	Establishes acceptable noise levels.

Applicable Law	Description
City of Ceres Municipal Code(Chapter 9.36: “Noise” and Chapter 18.38: “Material Effects”)	Limits construction noise to daytime hours and establishes acceptable noise levels.

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations designed to protect workers against the effects of occupational noise exposure (29 CFR § 1910.95). These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed (see **NOISE Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers’ hearing to detect any degradation.

There are no federal laws governing off-site (community) noise.

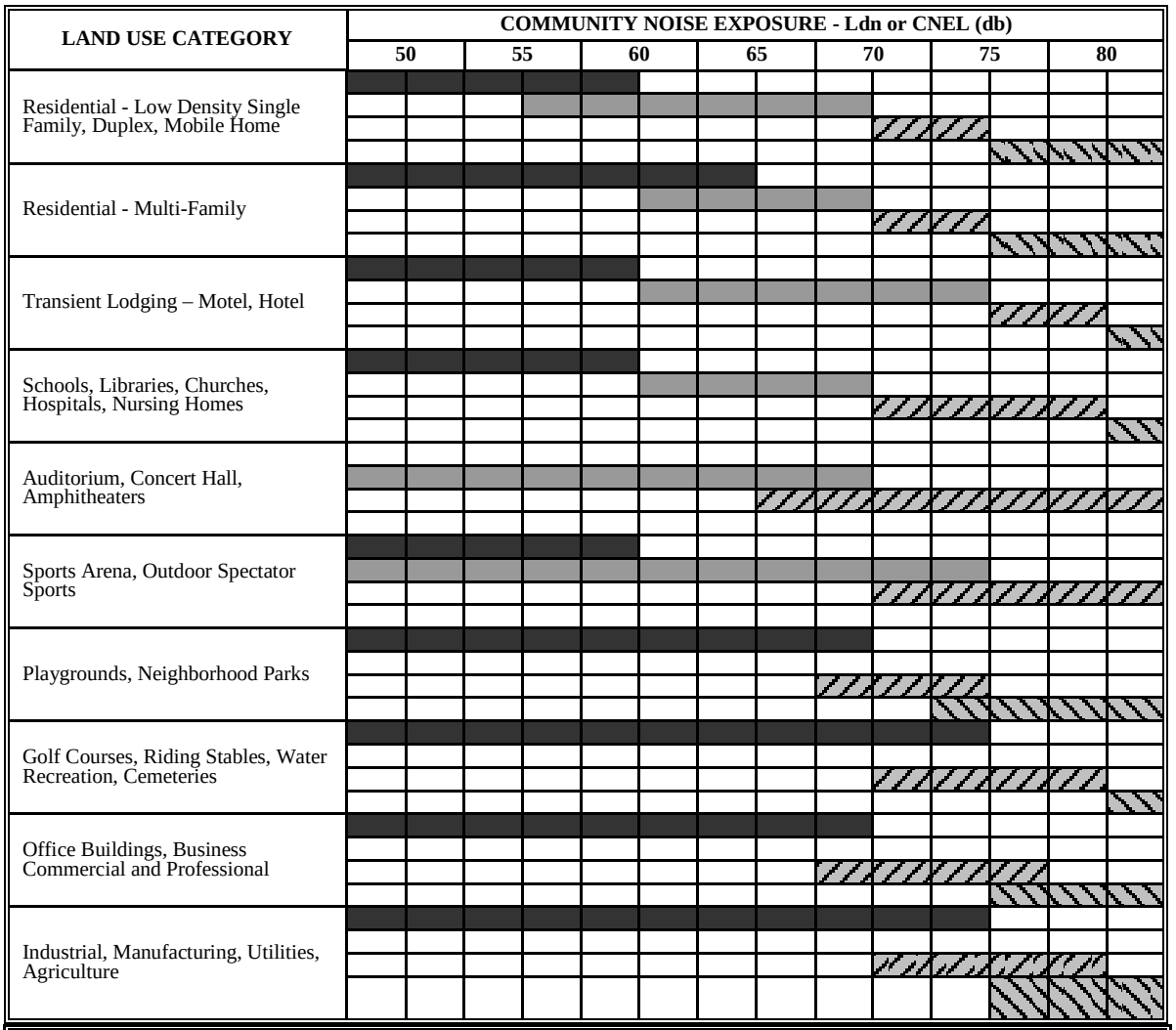
The only guidance available for evaluation of power plant vibration is guidelines published by the Federal Transit Administration (FTA) for assessing the impacts of groundborne vibration associated with construction of rail projects. These guidelines have been applied by other jurisdictions to assess groundborne vibration of 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 groundborne vibration. The FTA measure of the threshold of perception is 65 VdB,[1] 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 2**.

[1] VdB is the common measure of vibration energy.

Noise Table 2
Land Use Compatibility for Community Noise Environment



Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.

The California Occupational Safety and Health Administration (Cal/OSHA) has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095–5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards (see the **Worker Safety and Fire Protection** section of this document, and **NOISE Appendix A, Table A4**).

LOCAL

Stanislaus County General Plan, Noise Element

The County's General Plan Noise Element identifies single-family and multiple-family residential uses in residential zones as noise sensitive land uses (Stanislaus 2006, Chapter 4, section 4.0). As shown in Figure 3 of the Noise Element the County General Plan adopts the state land use compatibility guidelines (shown in **Noise Table 2**, above). Additionally, Policy Two of the Noise Element requires new stationary noise sources to mitigate noise emissions so that noise levels at noise sensitive land uses do not exceed the noise level standards presented in Table 4; this table is reproduced here as **Noise Table 3**:

Noise Table 3 – Stanislaus County Noise Element
Maximum allowable Noise Exposure – Stationary Noise Sources

	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
Hourly level (L_{eq}), dBA	55	45
Maximum level (L_{max}), dBA	75	65

Source: Stanislaus 2006, Table 4

The General Plan further states that where measured ambient noise levels exceed the standards, the standards (as shown above in **Noise Table 3**) should reflect the ambient noise levels.

Stanislaus County Ordinance Code

The County Code prohibits the production of "loud and raucous" noise, defined as noise that would be a nuisance to a person of ordinary sensibilities. The Code enumerates high pressure steam blows from stationary internal combustion engines as a public nuisance subject to this noise prohibition.

City of Ceres General Plan

The City of Ceres General Plan, policy 7.H.2, requires that noise created by new proposed non-transportation sources be mitigated so as not to exceed the noise level standards presented in Table 7-1 as measured at the property line of lands designated for noise-sensitive uses. Table 7-1 of the city's general plan is identical to Table 4 of the Stanislaus County General Plan Noise Element, reproduced in **Noise Table 3**, above (City of Ceres 1997).

City of Ceres Municipal Code

The City of Ceres has adopted the state land use compatibility guidelines (presented in **Noise Table 2** above) in its Municipal Code (City of Ceres 2008, section 18.36.060). Additionally, noise regulations applicable to the construction and operation of the project are set forth in the municipal code. Regulation section 9.36.020 limits noise level variation during nighttime hours, stating that "the erection (including excavation), demolition, alteration or repair of any building other than between the hours of seven o'clock (7:00) A.M. and eight o'clock (8:00) P.M" would be in violation of the provisions of the code.

SETTING

The A2PP would be constructed on land adjacent to the existing TID Almond Power Plant, located approximately 2 miles southwest of the City of Ceres, in Stanislaus County. The land surrounding the project site is zoned for agricultural and residential uses (TID2009a, AFC §§ 1.1, 5.6.1)

The ambient noise regime in the project vicinity consists primarily of traffic from Highway 99 and local roads. The nearest sensitive noise receptor is a residence located approximately 0.3 miles northeast of the project site (TID2009a, AFC § 5.7.2.1, Figure 5.7-1).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

1. exposure of persons to, or generation of, noise levels in excess of standards established in the local General Plan or noise ordinance or applicable standards of other agencies;

2. exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

3. substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or

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

The Energy Commission staff, in applying item 3 above to the analysis of this and other projects, has concluded that a potential for a significant noise impact exists where the noise of the project plus the background exceeds the background by 5 dBA or more at the nearest sensitive receptor.

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 considered 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 the case.

Factors to be considered in determining the significance of an adverse impact as defined above include:

1. the resulting combined noise level;[2]

2. the duration and frequency of the noise;

3. the number of people affected;

4. the land use designation of the affected receptor sites; and

5. public concern or controversy as demonstrated at workshops or hearings or by correspondence.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

- the construction activity is temporary;
- use of heavy equipment and noisy activities are limited to daytime hours; and
- all industry-standard noise abatement measures are implemented for noise-producing equipment.

Staff uses the above method and threshold to protect the most sensitive populations, including the minority population.

Ambient Noise Monitoring

In order to establish a baseline for comparison of predicted project noise to existing ambient noise, the applicant has presented the results of an ambient noise survey (TID2009a, AFC § 5.7.2.2; Tables 5.7-3 through 5.7-7). The survey was conducted January 20 through January 22, 2009, and monitored existing noise levels at the following locations, shown on **Noise Table 4**:

1. Location M1: Near a residence located approximately 2700 feet northwest of the project's northern boundary.

2. Location M2: Near the center of an existing residential development within the city of Ceres, located approximately 3,375 feet northeast of the project's northern boundary.

3. Location M3: Near the southern edge of a residential development within the city of Ceres, located approximately 1,875 feet to the northeast of the project's northern boundary. This location represents the nearest sensitive receptor, the one most likely to be impacted by project noise.

4. Location M4: Near a residence located approximately 3,375 feet southeast of the project's southern boundary.

5. Location M5: Near a residence located approximately 2,275 feet west of the project's western boundary.

[2] 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 4 summarizes the ambient noise measurements:

Noise Table 4
Summary of Measured Ambient Noise Levels

Measurement Location	Measured Noise Levels, dBA		
	L_{eq} – Daytime[1]	L_{eq} – Nighttime[2]	L_{90} – Nighttime[3]
M1: Northwest Residence	55	53	43
M2: Northeast Residences	55	46	41
M3: Nearest Receptor	60	55	40
M4: Southeast Residence	59	56	46
M5: West Residence	63	60	43

Source: TID2009a, AFC Tables 5.7-3 through 5.7-7
[1] Staff calculations of average of 15 daytime hours
[2] Staff calculations of average of 9 nighttime hours
[3] Staff calculations of average of 4 consecutive quietest hours of the nighttime

DIRECT IMPACTS AND MITIGATION

Noise impacts associated with the project can be created by short-term construction activities and by normal long-term operation of the power plant.

Construction Impacts and Mitigation

Construction noise is usually considered a temporary phenomenon. Construction of the A2PP is expected to be typical of similar projects in terms of schedule, equipment used, and other types of activities (TID2009a, AFC § 5.7.3.2).

Compliance with LORS

Construction of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances.

The Applicant has predicted the noise impacts of project construction on the nearest sensitive receptors (TID2009a, AFC § 5.7.3.2.1, Tables 5.7-9 through 5.7-11). A maximum construction noise level of 89 dBA L_{eq} is estimated to occur at a distance of 50 feet from the acoustic center of the construction activity (most often the power block) and attenuate to no more than 57 dBA L_{eq} at the nearest sensitive receptor, location M3 (TID2009a, AFC Table 5.7-9; and staff calculations). A comparison of construction noise estimates to measured ambient conditions is summarized in **Noise Table 5**.

Noise Table 5
Predicted Power Plant Construction Noise Impacts

Receptor	Highest Construction Noise Level[1] (dBA L_{eq})	Measured Existing Ambient[2] (dBA L_{eq})	Cumulative (dBA L_{eq})	Change (dBA)
M1: Northwest Residence	54	55 daytime	57 daytime	+2 daytime
		53 nighttime	57 nighttime	+4 nighttime
M2: Northeast Residences	52	55 daytime	57 daytime	+2 daytime
		46 nighttime	53 nighttime	+7 nighttime
M3: Nearest Receptor	57	60 daytime	60 daytime	+0 daytime
		55 nighttime	59 nighttime	+4 nighttime
M4: Southeast Residence	52	59 daytime	60 daytime	+1 daytime
		56 nighttime	57 nighttime	+1 nighttime
M5: West Residence	55	63 daytime	64 daytime	+1 daytime
		60 nighttime	61 nighttime	+1 nighttime

1 Source: TID2009a, AFC Table 5.7-8; and staff calculations
2 Source: TID2009a, AFC Tables 5.7-3 through 5.7-7; and staff calculations of average of daytime and nighttime hours

The applicable local noise LORS do not limit the loudness of construction noise, but staff compares the projected noise levels with ambient levels (please see the following discussion under **CEQA Impacts**).

Noisy construction work would be allowed only during the daytime hours of 7:00 a.m. to 8:00 p.m. in compliance with the City of Ceres Municipal Code. To ensure that these hours are, in fact, enforced, staff proposes Condition of Certification **NOISE-6**. Therefore, the noise impacts of the A2PP construction activities would comply with the noise LORS.

CEQA Impacts

Since construction noise typically varies with time, it is most appropriately measured by, and compared with, the L_{eq} (energy average) metric. As seen in **Noise Table 5** above, last column, the highest increase in the ambient noise levels at the project's noise-sensitive receptors would be 7 dBA. An increase of 7 dBA would be noticeable and potentially significant. Given that noisy construction activities would be limited to daytime hours, however, the noise effects of plant construction are considered to be less than significant.

To ensure the project construction would create less than significant adverse impacts at the most noise-sensitive receptors, in addition to Condition of Certification **NOISE-6**, staff proposes Conditions of Certification **NOISE-1** and **NOISE-2**, which would establish a notification process and a noise complaint process to resolve any complaints regarding construction noise.

In light of the following proposed conditions of certification, the noise impacts of the A2PP construction activities would be less than significant.

Linear Facilities

New offsite linear facilities will include an approximately 11.6-mile-long natural gas pipeline, as well as two transmission lines (approximately 0.9 and 1.2 miles long, respectively). The applicant intends to utilize an existing water supply pipeline from the adjacent Almond Power Plant (TID2009a, AFC §§ 2.1, 2.1.1.1).

Construction of linear facilities typically moves along at a rapid pace, thus not subjecting any one receptor to noise impacts for more than two or three days. Further, construction activities would be limited to daytime hours. To ensure that these hours are, in fact, adhered to, in compliance with the LORS, staff proposes Condition of Certification **NOISE-6**.

Pile Driving

The applicant has not specifically discussed the possible use of pile driving during construction of The A2PP, but pile drivers have been listed as common construction equipment (TID2009a, AFC § 5.7.3.2.1, Table 5.7-11). If pile driving is required for construction of the project, the noise from this operation could be expected to reach 104 dBA at a distance of 50 feet. Pile driving noise would thus be projected to reach levels of 73 dBA at location M3, the nearest residential receptor (TID2009a, AFC Table 5.7-11; staff calculations). As shown in **Noise Table 6,** the greatest increase over ambient noise levels resulting from pile driving would occur at location M1 with an increase of 14 dBA. While this would produce a noticeable impact, staff believes that limiting pile driving to daytime hours, in conjunction with its temporary nature, would result in impacts tolerable to residents. Staff proposes Condition of Certification **NOISE-6** to ensure that pile driving, should it occur, would be limited to daytime hours.

Noise Table 6
Pile Driving Noise Impacts

Receptor	Pile Driving Noise Level (dBA L_{eq})	Daytime Ambient Noise Level (dBA L_{eq})	Cumulative Level (dBA)	Change (dBA)
M1	69	55	69	+14
M2	67	55	67	+12
M3	73	60	73	+13
M4	67	59	67	+8
M5	71	63	72	+11

Source: TID2009a, AFC Table 5.7-11 and staff calculations

Vibration

The only construction operation likely to produce vibration that could be perceived off site would be pile driving, should it be employed. Vibration attenuates rapidly; it is likely

that no vibration would be perceptible at any appreciable distance from the project site. Staff therefore believes there would be no significant impacts from construction vibration at the project's noise-sensitive receptors.

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 (TID2009a, AFC § 5.7.3.2.3). To ensure that construction workers are, in fact, adequately protected, staff has proposed Condition of Certification **NOISE-3**, below.

Operation Impacts and Mitigation

The primary noise sources of the A2PP include combustion turbine generators, SCR units, stacks, compressors, and transformers (TID2009a, AFC § 2.1.2, 2.1.4, Table 5.7-11). Staff compares the projected noise with applicable LORS. In addition, staff evaluates any increase in noise levels at sensitive receptors due to the project in order to identify any significant adverse impacts.

Compliance with LORS

The applicant performed noise modeling to determine the project's noise impacts on sensitive receptors (TID2009a, AFC § 5.7.3.3.3, Table 5.7-13). The applicant has predicted operational noise levels, summarized in **Noise Table 7** below.

Noise Table 7

Predicted Operational Noise Levels and Noise LORS

Receptor	Project Alone Operational Noise Level L_{eq} (dBA)[1]	Stanislaus County General Plan, L_{eq} (dBA)[2]
M1	46	55 day/ 53 night
M2	44	55 day/ 46 night
M3	49	60 day/ 55 night
M4	44	59 day/ 56 night
M5	47	63 day/ 60 night

Sources: [1] TID2009a, AFC § 5.7.3.3.3; staff calculations
[2] Noise Table 3 and Noise Table 4, above

The applicant has incorporated noise reduction measures into the design of the project to ensure that there will not be a substantial increase in noise levels at the nearest receptors. The local planning policy guidelines for Stanislaus County and the City of Ceres require new projects to meet the acceptable exterior noise level standards listed in **Noise Table 3**, in residential areas. Existing ambient conditions at the residential receptors closest to the project site for the A2PP, however, are higher than those noise level standards described in the guidelines. The LORS state that in such an instance the noise level standards shall be increased to the ambient levels, as shown in **Noise Table 7**, above.

As seen in **Noise Table 7**, the project's operational noise level at the nearest receptors would be no more than 49 dBA L_{eq}. This is 11 decibels below the 60 dBA Leq daytime noise limit and 2 decibels below the 46 dBA Leq nighttime limit at location M2, which is the most noise impacted sensitive receptor. Therefore, the project's operational noise

impacts at the nearest sensitive receptors (M1 through M5) would comply with both the City of Ceres and Stanislaus County noise LORS. To ensure compliance, staff proposes Condition of Certification **NOISE-4**.

CEQA Impacts

Power plant noise is unique. A power plant operates as, essentially, a steady, continuous, broadband noise source, unlike the intermittent sounds that make up most of the noise environment. Power plant noise therefore contributes to, and becomes a part of, background noise levels, or the sound heard when most intermittent noises stop. Where power plant noise is audible, it tends to define the background noise level. For this reason, staff typically compares projected power plant noise to existing ambient background (L_{90}) noise levels at affected sensitive receptors. If this comparison identifies a significant adverse impact, then feasible mitigation must be applied to the project to either reduce or remove that impact.

For residential receptors, staff evaluates project noise emissions by comparing them with nighttime ambient background levels; this evaluation assumes that the potential for public annoyance from power plant noise is greatest at night when residents are trying to sleep. Nighttime ambient noise levels are typically lower than daytime levels; differences in background noise levels of 5 to 10 dBA are common. Staff believes it is prudent to average the lowest nighttime hourly background noise levels to arrive at a reasonable baseline for comparison with the project's predicted noise level.

Adverse impacts on residential receptors can be identified by comparing predicted power plant noise levels with the nighttime ambient background noise levels at the nearest sensitive residential receptors.

The applicant has predicted operational noise levels; they are summarized here in **Noise Table 8**.

Noise Table 8
Predicted Operational Noise Levels and CEQA

Receptor	Project Alone Operational Noise Level L_{eq} (dBA) [1]	Measured Existing Ambient, Average Nighttime L_{90} (dBA) [2]	Project Plus Ambient L_{90} (dBA)	Change in Ambient Level
M1	46	43	48	+5
M2	44	41	46	+5
M3	49	40	50	+10
M4	44	46	48	+2
M5	47	43	48	+5

[1] Source: TID2009a, AFC § 5.7.3.3.3; staff calculations
[2] Source: TID2009a, AFC Tables 5.7-3 through 5.7-7; and staff calculations of average of four quietest consecutive nighttime hours

Combining the ambient noise level of 46 dBA L_{90} (**Noise Table 4**, above) with the project noise level of 44 dBA at M4 would result in 48 dBA L_{90}, 2 dBA over the ambient. As described above (in **Method and Threshold for Determining Significance**), staff regards an increase of up to 5 dBA as a less-than-significant impact. Therefore, staff considers the above noise impacts at M4 to be less than significant.

Combining the ambient noise level of 41 dBA L_{90} (**Noise Table 4**) with the project noise level of 44 dBA at M2 would result in 46 dBA L_{90}, 5 dBA above the ambient. Combining ambient noise levels with project noise levels at M1 and M5 also results in an increase of 5 dBA above the ambient. While this is a noticeable increase, it lies within the range staff considers less than significant. To ensure these noise levels are not further exceeded, staff proposes Condition of Certification **NOISE-4**, below.

Combining the ambient noise level of 40 dBA L_{90} (**Noise Table 4**) with the project noise level of 44 dBA at M3 would result in 50 dBA L_{90}, 10 dBA over the ambient. Staff regards an increase between 5 dBA and 10 dBA to be potentially significant; given that this increase would occur at nighttime when people are trying to sleep, a 10 dBA increase would be significant and mitigation would be required. For operational noise to be less than significant at receptor M3, the combined nighttime noise level (project operational plus ambient) would need to not increase the existing nighttime ambient noise by more than 5 dBA, or be greater than 45 dBA, which would equate to a project operational noise no greater than 44 dBA at location M3. The proposed Condition of Certification **NOISE-4** would ensure that this reduced project operational noise level at M3 is not exceeded.

Tonal Noises

One possible source of disturbance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. The applicant plans to address overall noise in project design, and to take appropriate measures, as needed, to eliminate tonal noises as possible sources of annoyance (TID2009a, AFC § 5.7.3.3.4). To ensure that tonal noises do not cause annoyance, staff proposes Condition of Certification **NOISE-4**, below.

Linear Facilities

All gas piping would lie underground and would be silent during operation. Noise effects from the electrical interconnection line typically do not extend beyond the right-of-way easement of the line and would thus be inaudible to any receptors.

Vibration

Vibration from an operating power plant could be transmitted through two primary means: ground (ground-borne vibration), and air (airborne vibration).

The operating components of a simple cycle power plant consist of high-speed gas turbines, compressors, and various pumps. All of these pieces of equipment must be carefully balanced in order to operate; permanent vibration sensors are attached to the turbines and generators. Based on experience with numerous previous projects employing similar equipment, Energy Commission staff believes that ground-borne vibration from the A2PP would be undetectable by any likely receptor.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves, and can rattle the walls of lightweight structures. The A2PP's chief source of airborne vibration would be the gas turbines' exhaust. In a power plant such as the A2PP, however, the exhaust must pass through the selective catalytic reduction (SCR)

modules and the stack silencers before it reaches the atmosphere. The SCRs act as efficient mufflers. The combination of SCR units and stack silencers makes it highly unlikely that the A2PP would cause perceptible airborne vibration effects

Worker Effects

The applicant has acknowledged the need to protect plant operating and maintenance workers from noise hazards and has committed to comply with applicable LORS (TID2009a, AFC § 5.7.3.3.1). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. To ensure that plant operation and maintenance workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-5**, below.

CUMULATIVE IMPACTS AND MITIGATION

Section 15130 of the CEQA Guidelines (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

The applicant has identified thirty-three projects in the vicinity of the A2PP that have been approved by the City of Ceres Planning Department; only one of these projects (increased stand-by power at Blaker Reservoir) introduces a potential new noise source(TID2009a, AFC § 5.7.4). However this project is more than 2 miles away from the A2PP site; too far to cause cumulative impacts when combined with the A2PP.

FACILITY CLOSURE

In the future, upon closure of the A2PP, all operational noise from the project would cease, and no further adverse noise impacts from operation of the A2PP would be possible. The remaining potential temporary noise source is the dismantling of the structures and equipment and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction, it can be treated similarly. That is, noisy work could be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that were in existence at that time would apply. Applicable conditions of certification included in the Energy Commission decision would also apply unless modified.

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that the A2PP, if built and operated in conformance with the proposed conditions of certification below, would comply with all applicable noise and vibration LORS and would produce no significant adverse noise impacts on people within the project area, including the minority population, directly, indirectly, or cumulatively.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 Prior to ground disturbance, the project owner shall notify all residents within two miles of the site and one mile of the linear facilities, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project and include that telephone number in the above notice. 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: At least 15 days prior to the start of ground disturbance, the project owner shall transmit to the Compliance Project Manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed and describing the method of that notification, verifying that the telephone number has been established and posted at the site, and giving that telephone number.

NOISE COMPLAINT PROCESS

NOISE-2 Throughout the construction and operation of the A2PP, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- Take all feasible measures to reduce the noise at its source if the noise is project related; and
- Submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts, and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within five days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form with the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a three-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program and a statement, signed by the project owner's project manager, verifying that the noise control program will be implemented

throughout construction of the project. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal/OSHA standards.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM the noise control program and the project owner's project manager's signed statement. The project owner shall make the program available to Cal/OSHA upon request.

NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the noise levels due to operation of the project alone will not exceed: an hourly average of 44 dBA, measured at or near monitoring locations M2 (approximately 3,375 feet northeast of the project site boundary), M3 (approximately 1,875 feet northeast of the project site boundary), and M4 (approximately 3,375 feet southeast of the project site boundary); an hourly average of 46 dBA, measured at or near monitoring location M1 (approximately 2,700 feet northwest of the project site boundary); and an hourly average of 47 dBA, measured at or near monitoring location M5 (approximately 2,275 feet west of the project site boundary).

No new pure-tone components shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints.

A. When the project first achieves a sustained output of 85% or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location M3, or at a closer location acceptable to the CPM. This survey during the power plant's full-load operation shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

   During the period of this survey, the project owner shall conduct a survey of noise at monitoring locations M1, M2, M4 and M5, or at closer locations acceptable to the CPM. The short-term noise measurements at these locations shall be conducted during the nighttime hours of 10:00 p.m. to 7:00 a.m.

   The measurement of power plant noise for the purposes of demonstrating compliance with this condition of certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

B. If the results from the noise survey indicate that the power plant noise at the affected receptor sites exceeds the above values, mitigation measures

shall be implemented to reduce noise to a level of compliance with these limits.

C. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

Verification: The survey shall take place within 30 days of the project first achieving a sustained output of 85% or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report shall be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limit, and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

NOISE-5 Following the project's first achieving a sustained output of 85% 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 and Title 29, Code of Federal Regulations section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

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

CONSTRUCTION TIME RESTRICTIONS

NOISE-6 Heavy equipment operation and noisy construction work relating to any project features, including pile driving, shall be restricted to the times delineated below:

Any Day:	7:00 a.m. to 8:00 p.m.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Almond 2 Power Plant
(09-AFC-2)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

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

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

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

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

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

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

This information is certified to be correct:

Plant Manager's Signature: _____

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

REFERENCES

Ceres 1997 – City of Ceres General Plan, Chapter 7. February 1997

Ceres 2008 – City of Ceres Municipal Code, Chapters 18.38 and 9.36. 2008.

Stanislaus 2006 – Stanislaus County General Plan Noise Element. 2005.

Stanislaus 2008 – Stanislaus County Code, Chapter 10.46. 2006.

TID2009a –Turlock Irrigation District/ R. Baysinger (tn: 51502). Application for Certification, Volume 1& 2. Dated 5/11/09. Submitted to CEC/Docket Unit on 5/11/09.

NOISE APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that "A-weighting" of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **NOISE Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (L_{eq}), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (L_{dn}). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical L_{dn} values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, those higher levels 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 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 (U.S. Environmental Protection Agency, Effects of Noise on People, December 31, 1971).

To help the reader understand the concept of noise in decibels (dBA), **NOISE Table A2** illustrates 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 1 dB cannot be perceived.

2. Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.

3. A change in level of at least 5 dB is required before any noticeable change in community response would be expected.

4. A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response (Kryter, Karl D., The Effects of Noise on Man, 1970).

Combination of Sound Levels

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a 3-dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus 3 dB). **NOISE Table A3** indicates the rules for decibel addition used in community noise prediction.

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 6 dB.

Increasing the distance from a noise source 10 times reduces the sound pressure level by 20 dB.

Worker Protection

OSHA noise regulations are designed to protect workers against the effects of noise exposure and list permissible noise level exposure as a function of the amount of time to which the worker is exposed, as shown in **NOISE Table A4**.

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 CFR § 1910.95.

PUBLIC HEALTH

Testimony of Alvin Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

Staff has analyzed potential public health risks associated with construction and operation of the Almond 2 Power Plant (A2PP) project and does not expect any significant adverse cancer or short- or long-term noncancer health effects from project toxic emissions. Staff's analysis of potential health impacts from the proposed A2PP uses a conservative health-protective methodology that accounts for impacts to the most sensitive individuals in a given population, including newborns and infants. Staff's health risk assessment shows that emissions from the A2PP would not contribute significantly to morbidity or mortality in any age or ethnic group residing in the project area.

INTRODUCTION

The purpose of this Staff Assessment (SA) is to determine if emissions of toxic air contaminants (TACs) from the proposed A2PP would 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.

California Energy Commission (Energy Commission) staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section of this PSA, and 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 **Soil and Water Resources** section. Plant releases in the form of hazardous and nonhazardous wastes are described in the **Waste Management** section.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

PUBLIC HEALTH Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Clean Air Act section 112 (Title 42, U.S. Code section 7412)	The National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires new sources that emit more than 10 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.
State	
California Health and Safety Code section 25249.5 et seq. (Proposition 65)	These sections establish thresholds of exposure to carcinogenic substances above which Prop 65 exposure warnings are required.

California Health and Safety Code section 41700	This section states that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."
California Public Resource Code section 25523(a); Title 20 California Code of Regulations (CCR) section 1752.5, 2300–2309 and Division 2 Chapter 5, Article 1, Appendix B, Part (1); California Clean Air Act, Health and Safety Code section 39650, et seq.	These regulations require a quantitative health risk assessment for new or modified sources, including power plants that emit one or more toxic air contaminants (TACs).

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Characteristics of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. 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, affect public exposure to project emissions. Additional factors affecting potential public health impacts include existing air quality, existing public health concerns, and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The project site is located in the City of Ceres, California. Land uses in the vicinity of the proposed project site include the existing Almond Power Plant (immediately south), various industrial facilities, commercial facilities, and agricultural fields (mainly Almond orchards). There are several residential uses within a one-mile radius of the site (TID2009a, Section 5.6.1.1). Sensitive receptors in the project vicinity (within a 3-mile radius) are listed in **Appendix 5.9A** and shown in **Figure 5.9-4** (TID2009a). The nearest sensitive receptor is a child care center located approximately 0.75 miles northeast of the site. The nearest residences are located about 0.3 miles northeast of the site (TID2009a, Section 5.9.2).

The A2PP would have three stacks, one for each combustion turbine generator. The stack heights would be 80 feet (TID2009a, Table 5.1D-3). The location of elevated terrain (above the stack height) is important in assessing potential exposure, as an emission plume may impact high elevations before impacting lower elevations. The site's elevation is about 80 feet above mean sea level, and the topography of the immediate vicinity is generally flat. No elevated terrain exists for many miles from the site (TID2009a, Section 5.1.1.1).

METEOROLOGY

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced, and localized exposure may be increased.

The project region is characterized by a moderate climate; summers are hot and dry and winters are mild with little precipitation. The average annual rainfall is 12.3 inches with most of it occurring between November and March. Quarterly wind roses for the region are provided in Appendix 5.1B of the AFC. Winds during winter are generally light and flow from the west, while during summer winds are strong and flow from the east (TID2009a, Section 5.1.1.2).

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 the San Joaquin Valley Air Pollution Control District (SJVAPCD). By examining average toxic concentration levels from representative air monitoring sites 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 in the United States is about 1 in 3, or 333,000 in 1 million.

Air monitoring performed by the California Air Resources Board (CARB) in the San Joaquin Valley Air Basin shows that average concentrations for the top ten TACs have been on the decline. Ambient concentrations of these TACs measured in the San Joaquin Valley Air Basin are presented in Table 5.9-1 of the AFC along with the modeled cancer risk for each TAC (TID2009a). The total cancer risk obtained by adding the individual risks is 527 in one million. [Note that diesel PM values are taken from the year 2000 and carbon tetrachloride values are taken from the year 2003, while all other values were measured in 2006.]

The nearest California Air Resources Board (CARB) air toxics monitoring station that actively reports values is located on Hazelton Ave in Stockton, approximately 30 miles northwest of the project site. In 2008, the background cancer risk calculated by CARB for the Stockton site was 69 in one million (CARB 2009). 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 risk. The risk from 1,3-butadiene was about 18 in one million while the risk from benzene was about 22 in one million. Formaldehyde accounts for about 20% of the 2008 average calculated cancer risk

based on air toxics monitoring results, with a risk of about 14 in one million. Formaldehyde is emitted directly from vehicles and other combustion sources, such as the proposed facility. The risk from hexavalent chromium was about 9 in one million, or ~13% of the total risk.

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 in all areas of the state and the nation. For example, in the San Francisco Bay Area, cancer risk was 342 in 1 million based on 1992 data, 315 in 1 million based on 1994 data, and 303 in 1 million based on 1995 data. In 2002, the most recent year for which data is available, the average inhalation cancer risk decreased to 162 in 1 million (BAAQMD 2004b, p. 12).

EXISTING PUBLIC HEALTH CONCERNS

When evaluating a new project, staff sometimes conducts a detailed study and analysis of existing public health issues in the project vicinity. This analysis is prepared in order to identify the current status of respiratory diseases (including asthma), cancer, and childhood mortality rates in the population located near the proposed project. Assessing existing health concerns in the project area can provide staff with a basis on which to evaluate the significance of any additional health impacts from the proposed A2PP project and evaluate any proposed mitigation. Staff did not conduct a detailed analysis because the applicant provided information from the Stanislaus County Public Health Services Department regarding studies performed in the region (TID2009a, Section 5.9.2). The results of these studies show that while adult asthma rates are slightly lower than the statewide average (11.9% of population verses 12.7%), asthma rates in children are higher (20.4% verses 16.1%). In addition, cancer death rates in Stanislaus County were found to be on the decline, but still higher than the statewide average (190 versus 180 per 100,000 population).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The **PUBLIC HEALTH** section of this staff assessment discusses 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 contact, or ingestion via contaminated food or water.

Air pollutants for which no ambient air quality standards have been established are called noncriteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, noncriteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Since noncriteria pollutants do not have such standards, a health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment consists of the following steps:

- identify the types and amounts of hazardous substances that A2PP could emit to the environment;
- estimate worst-case concentrations of project emissions in the environment using dispersion modeling;
- estimate amounts of pollutants that people could be exposed to through inhalation, ingestion, and dermal contact; and
- characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Staff relies upon the expertise of the California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) to identify contaminants that are known to the state to cause cancer or other noncancer toxicological endpoints and to calculate the toxicity and cancer potency factors of these contaminants. Staff also relies upon the expertise of the California Air Resources Board and the local air districts to conduct ambient air monitoring of toxic air contaminants and the state Department of Public Health to conduct epidemiological investigations into the impacts of pollutants on communities. It is not within the purview or the expertise of the Energy Commission staff to duplicate the expertise and statutory responsibility of these agencies.

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 as estimated by the screening level assessment. The risks for screening purposes are based on examining conditions that would lead to the highest, or worst-case, risks and then using those conditions 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 estimated to be the highest;
- assuming that an individual's exposure to cancer-causing agents occurs continuously for 70 years; and
- using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses).

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 that could present a health hazard from noninhalation pathways of exposure (OEHHA

2003, Tables 5.1, 6.3, 7.1). 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 (OEHHA 2003, p. 5-3).

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 that arise as a result of long-term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from 12% to 100% of a lifetime, or from 8 to 70 years (OEHHA 2003, p. 6-5). 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 (OEHHA 2003, p. 6-2). 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 which makes them more sensitive to the effects of toxic substance exposure. The Reference Exposure Levels 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 at the time of standard setting 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 conformity with the 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 (OEHHA 2003, pp. 1-5, 8-12). Other possible mechanisms due to multiple exposures include those cases where the actions may be synergistic or antagonistic (where the effects are greater or less than the sum, respectively). For these types of substances, the health risk assessment could underestimate or overestimate the risks.

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.

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 OEHHA), 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 due to project emissions are likely to be considerably lower than those estimated.

The screening analysis is performed to assess worst-case risks to public health associated with the proposed project. 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.

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, noncriteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. The 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 noncancer 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 1.0 signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance that 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 1.0 indicates that cumulative worst-case exposures are less than the reference exposure levels. Under these conditions, health protection from the project is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant noncancer project-related public health impacts.

Cancer Risk

Staff relied 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 section 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 10 in 1 million, which is also written as 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 applied by Proposition 65. The significant risk level of 10 in 1 million is consistent with the level of significance adopted by many air districts. In general, these air districts would not approve a project with a cancer risk exceeding 10 in 1 million. The SJVAPCD also uses 10 in 1 million as the level of significant health risk (TID2009a, Section 5.9.3.1.1).

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. Staff's analysis also addresses potential impacts on all members of the population including the young, the elderly, people with existing medical conditions that may make them more sensitive to the adverse effects of toxic air contaminants, and any minority or low-income populations that are likely to be disproportionately affected by impacts. To accomplish this goal, staff uses the most current acceptable public health exposure levels (both acute and chronic) set to protect the public from the effects of airborne toxics. When a screening analysis shows cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. Based on refined assumptions, if risk posed by the facility exceeds the significance level of 10 in 1 million, staff would require appropriate measures to reduce the risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than 10 in 1 million, staff would deem such risk to be significant and would not recommend project approval.

DIRECT/INDIRECT IMPACTS AND MITIGATION

CONSTRUCTION IMPACTS AND MITIGATION

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 diesel exhaust 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.

Site disturbances 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. The Phase I Environmental Site Assessment (ESA) conducted for this site in 2009 identified no "Recognized Environmental Conditions" per the American Society for Testing and Materials Standards (ASTM) definition. That is, there was no evidence or record of any use, spillage or disposal of hazardous substances on the site, nor any other environmental condition that would require remedial action.

The Phase I ESA did however identify two areas of possible concern: potentially high levels of nitrates in groundwater and potential soil contamination of site fill material due to historical pesticide use. Based on the recommendations of the Phase I ESA, a Phase

II ESA was conducted for the site to test soil for pesticide contamination. The testing results indicate that the site's soil does not have organochlorine pesticides above the detectable limit, nor is the soil contaminated with metals or arsenic above expected background levels (TID2009a, Section 5.14.1.1.1). In the event that any unexpected contamination is encountered during construction of the A2PP, proposed Conditions of Certification **Waste-1** and **Waste-2** require a registered professional engineer or geologist to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil. See the staff assessment section on **Waste Management** for a more detailed analysis of this topic.

The operation of construction equipment will result in air emissions from diesel-fueled engines. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. 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. Environmental Protection Agency (U.S. EPA) as hazardous air pollutants and by the California Air Resources Board (ARB) as toxic air contaminants.

Exposure to diesel exhaust may cause both short- and long-term adverse health effects. Short-term effects can include increased coughing, 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 Scientific Review Panel on Toxic Air Contaminants recommended a chronic reference exposure level (see discussion of reference exposure levels in Method of Analysis section above) for diesel exhaust particulate matter of 5 micrograms of diesel particulate matter per cubic meter of air ($\mu g/m^3$) and a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$ (SRP 1998, p. 6). The Scientific Review Panel did not recommend a value for an acute Reference Exposure Level since available data in support of a value was deemed insufficient. On August 27, 1998, ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved the panel's recommendations regarding health effect levels.

Appendix 5.1E of the AFC (TID2009a) present the maximum daily and annual on-site and off-site emissions from construction of all project components. The maximum daily emissions of diesel particulate matter from on-site construction equipment were estimated by the applicant to be 3.86 pounds per day (TID2009a, Table 5.9-2). Construction of the entire project including linear facilities is anticipated to take place over a period of 12 months (TID2009a, Section 5.9.3.2). As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from 8 to 70 years.

The applicant prepared a health risk assessment for construction emissions of diesel particulate matter according to OEHHA guidelines (TID2009a, Appendix 5.1E, p.9). The

cancer risk calculated for the project's construction emissions modeled over a period of 9 years was 29 in one million, which exceeds the level of significance of 10 in one million (TID2009a, Section 5.9.3.2). The applicant stated that the effected area did not include any residences or sensitive receptors, and that the calculated risk is significantly over estimated since the construction period would only last 12 months, not 9 years as required by OEHHA guidelines for this type of health risk assessment.

Staff evaluated the applicant's risk assessment and reviewed the discussion of its significance. Staff agrees that the results, when assumed for a 12-month construction period rather than a 9-year period, show that the risk at the Point of Maximum Impact (PMI) would be less than 10 in one million (see staff's assessment below). If the risk at the PMI is less than 10 in one million, then the risk to any other off-site receptor, including residences, hospitals, and schools, will be even lower.

Nevertheless, mitigation measures are proposed by Energy Commission staff to further reduce the maximum calculated particulate matter emissions. These include the use of extensive fugitive dust control measures. The fugitive dust control measures are assumed to result in 90% reductions of emissions. Additionally, in order to mitigate potential impacts from particulate emissions during the operation of diesel-powered construction equipment, staff notes that the use of ultra-low sulfur diesel fuel, an oxidation catalyst and soot filters on diesel equipment is required. 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%. Such filters will reduce diesel emissions during construction and reduce any potential for significant health impacts.

OPERATION IMPACTS AND MITIGATION

Emissions Sources

The emissions sources at the proposed A2PP include three combustion turbine generators. The evaporative cooling system proposed for the A2PP would not contribute to TAC emissions due to the system's design which draws drift into the gas turbine (CH2MHILL2009f, Data Response #12). As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted from the facility.

AFC Appendix 5.1D (TID2009a, Table 5.1D-2) lists toxic air contaminants expected to be emitted from the CTGs as combustion byproducts along with their anticipated amounts (emission factors). Table 5.9-4 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 OEHHA Guidelines (OEHHA 2003). **PUBLIC HEALTH Table 2** lists the toxic emissions potentially emitted by the A2PP and shows how each contributes to the health risk analysis.

PUBLIC HEALTH Table 2:
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				✔	✔
Benzene			✔	✔	✔
1,3-Butadiene			✔	✔	
Ethylbenzene			✔	✔	
Formaldehyde			✔	✔	✔
Hexane				✔	
Naphthalene		✔	✔	✔	
PAHs			✔		
Propylene				✔	
Propylene oxide			✔	✔	✔
Toluene				✔	✔
Xylene				✔	✔

Source: OEHHA 2003, Appendix L and TID2009a, Table 5.9-4

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.

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 applicant’s screening analysis was performed using the ARB/OEHHA Hotspots Analysis and Reporting Program (HARP). Ambient concentrations were used in conjunction with Reference Exposure Levels 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 OEHHA’s Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2003) referred to earlier and results in the following health risk estimates.

Impacts

The applicant’s screening health risk assessment for the project including emissions from all sources resulted in a maximum acute Hazard Index (HI) of 0.01 and a

maximum chronic HI of 0.01 at the point of maximum impact (PMI). The total worst-case individual cancer risk was calculated by the applicant to be 0.7 in 1 million at the PMI. As **PUBLIC HEALTH Table 3** shows, both acute and chronic hazard indices are less than 1.0, and cancer risk is less than 10 in one million, indicating that no short- or long-term adverse health effects are expected.

PUBLIC HEALTH Table 3
Operation Hazard/Risk at Point of Maximum Impact: Applicant Assessment

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
Acute Noncancer	0.01	1.0	No
Chronic Noncancer	0.01	1.0	No
Individual Cancer	0.7 in a million	10.0 in a million	No

Source: TID2009a, Table 5.9-5

Staff conducted a quantitative evaluation of the risk assessment results presented in the Almond 2 Power Plant Project AFC (09-AFC-2) and in the "Data Responses, Set 1A" (September 2009). Modeling files provided by the applicant were also reviewed.

Construction Phase Analysis

For the construction phase analysis, atmospheric dispersion modeling of diesel particulate matter (DPM) emissions from construction equipment and vehicles was conducted by the applicant using the AERMOD Air Dispersion Model. The maximum predicted offsite concentration of diesel particulate matter was reported by the applicant to be 0.545 ug/m^3 (AFC Appendix 5.1E). Cancer risk due to diesel exhaust emissions during the 12 month construction period was determined by multiplying the DPM concentration by the diesel cancer inhalation unit risk of 0.0003 (ug/m^3)$^{-1}$ and adjusting for the 12 month construction period. Cancer risk at the location of the maximum offsite concentration was determined to be 2.3 in a million and chronic HI to be 0.11 (noncancer chronic REL is 5 ug/m^3).

Operations Phase Analysis

For the operations phase analysis, atmospheric dispersion modeling of facility emissions was conducted by the applicant using AERMOD. Local meteorological data were used, building downwash effects were included for 29 buildings, and 13,859 grid receptors were modeled.

A total of 5 emitting units were modeled by the applicant for facility operations including:

- 3 new combustion turbine generators
- 1 existing combustion turbine generator
- 1 existing diesel firewater pump

Staff used the HARP On-Ramp program to load the applicant's AERMOD results into the CARB/OEHHA Hotspots Analysis and Reporting Program (HARP), Version 1.4a for

the risk analysis. Exposure pathways assessed include inhalation, ingestion of home-grown produce, dermal absorption, soil ingestion and mother's milk. Emission factors obtained from the applicant's modeling files and used in this analysis are listed in **Public Health Table 4**. For risk calculations using the HARP model, the "Derived (Adjusted) Method" was used for cancer risk and the "Derived (OEHHA) Method" was used for chronic noncancer hazard. For the homegrown produce exposure pathway, a deposition rate of 0.05 m/sec for uncontrolled sources was assumed by staff, as well as the default non-urban setting of 0.15 for fraction of local produce consumed. In the applicant's analysis, the "Derived (OEHHA) Method" was used for cancer risk analysis and less conservative assumptions were made for the homegrown produce exposure pathway: deposition rate of 0.02 m/sec (controlled sources) and the default urban setting of 0.052 for fraction of local produce consumed.

Cancer risk and chronic and acute hazard index values obtained by staff are compared to results reported by the applicant in **Public Health Table 5**. Risk and hazard were determined at the point of maximum impact, PMI, under the 70 year residential scenario, located approximately 1900 feet southeast of the site for cancer and chronic hazard and approximately 800 feet southeast of the site for acute effects. There is a residential development approximately 1500 feet northeast of the site, and the nearest sensitive receptor is at Sinclear Elementary School, approximately 5280 feet northeast of the site.

Public Health Table 6 presents substance- and source-specific cancer risks due to the proposed new sources at the PMI. Analysis of this table indicates that each new CTG contributes 33% to the total cancer risk due to the new sources at the PMI. Additional analysis indicates that 76% of cancer risk at the PMI is attributed to emissions of PAHs (predominantly benzo(a)pyrene, dibenz(a,h)anthracene and naphthalene).

Public Health Table 4.
Operation Phase Emission Rates
(Source: Applicant's modeling files)

	EMISSION RATES FROM EACH OF 3 NEW CTGs		**EMISSION RATES FROM 1 EXISTING CTG**		**EMISSION RATES FROM 1 EMERGENCY FIRE PUMP**	
Substance	**Annual Average** (lbs/yr)	**Maximum 1-Hour** (lbs/hr)	**Annual Average** (lbs/yr)	**Maximum 1-Hour** (lbs/hr)	**Annual Average** (lbs/yr)	**Maximum 1-Hour** (lbs/hr)
1,3-Butadiene	5.50E+01	6.66E-03	1.87E+00	2.13E-04		
Acetaldehyde			1.73E+02	1.98E-02		
Acrolein	1.84E+02	2.22E-02	2.78E+01	3.17E-03		
Ammonia	6.16E+04	7.44E+00	1.32E+05	1.51E+01		
Benzene	2.93E+01	3.55E-03	5.21E+01	5.95E-03		
B[a]anthracene	7.09E-01	1.02E-05	6.75E-01	7.70E-05		
B[a]P	4.38E-01	6.30E-06	4.15E-01	4.74E-05		
B[b]fluoranthene	3.56E-01	5.12E-06	3.37E-01	3.85E-05		
B[k]fluoranthene	3.46E-01	4.98E-06	3.28E-01	3.75E-05		
Chrysene	7.93E-01	1.14E-05	7.52E-01	8.59E-05		
D[a,h]anthracene	7.37E-01	1.06E-05	7.02E-01	8.01E-05		
Ethyl Benzene	1.97E+00	2.39E-04	1.39E+02	1.59E-02		
Formaldehyde	1.47E+02	1.78E-02	3.08E+03	3.52E-01		

Hexane	3.25E+03	3.94E-01	1.12E+03	1.28E-01		
In[1,2,3-cd]pyrene	7.37E-01	1.06E-05	7.02E-01	8.01E-05		
Naphthalene	1.18E+03	1.43E-01	5.65E+00	6.45E-04		
Propylene	3.52E+03	4.26E-01	3.34E+03	3.81E-01		
Propylene Oxide	4.12E+00	4.99E-04	1.26E+02	1.44E-02		
Toluene	1.33E+02	1.61E-02	5.65E+02	6.45E-02		
Xylenes	5.96E+02	7.21E-02	2.78E+02	3.17E-02		
Diesel PM					1.32E+01	1.30E-01

Public Health Table 5.
Cancer Risk and Noncancer Hazard Due to Operation Phase Emissions of New Sources (3 new CTGs).

	Staff's Analysis			Applicant's Analysis *(AFC Table 5.9-5)*		
	Cancer Risk (per million)	Acute HI	Chronic HI	Cancer Risk (per million)	Acute HI	Chronic HI
PMI	1.4	0.011	0.0066	0.7	0.01	0.01
MEIR	0.061	0.0023	0.00030	0.04	n/a	0.01
MEIW	0.16	0.011	0.0066	0.1	n/a	n/a
Nearest sensitive receptor	0.017	0.00084	0.000081	n/a	n/a	n/a

PMI = point of maximum impact, cancer and chronic hazard PMI located approximately 1900 feet southeast of the site (Rec. #9645) acute hazard PMI located approximately 800 feet southeast of the site (Rec. #10128)
MEIR = nearest residence located approximately 1500 feet northeast of the site (Rec. #6967 approximated)
MEIW = maximally exposed individual worker located at cancer PMI, risk determined under worker exposure scenario
Nearest sensitive receptor = Sinclear Elementary School, located approximately 5280 feet northeast of the site (Rec. #3849 approximated)

Public Health Table 6.
Results of Staff's Analysis: Contribution to Total Cancer Risk by Individual Substances from Three New Sources at the Point of Maximum Impact (PMI).

Substance	New CTG 1	New CTG 2	New CTG 3	Total Cancer Risk
1,3-Butadiene	2.1E-08	2.2E-08	2.1E-08	6.4E-08
Benzene	1.9E-09	1.9E-09	1.9E-09	5.7E-09
B[a]anthracene	2.6E-08	2.6E-08	2.6E-08	7.8E-08
B[a]P	1.6E-07	1.6E-07	1.6E-07	4.8E-07
B[b]fluoranthene	1.3E-08	1.3E-08	1.3E-08	3.9E-08
B[k]fluoranthene	1.3E-08	1.3E-08	1.3E-08	3.8E-08
Chrysene	2.9E-09	2.9E-09	2.9E-09	8.7E-09
D[a,h]anthracene	9.3E-08	9.4E-08	9.3E-08	2.8E-07
Ethyl Benzene	1.1E-11	1.1E-11	1.1E-11	3.3E-11
Formaldehyde	2.0E-09	2.0E-09	2.0E-09	6.0E-09
In[1,2,3-cd]pyrene	2.7E-08	2.7E-08	2.7E-08	8.1E-08
Naphthalene	9.2E-08	9.3E-08	9.1E-08	2.8E-07
Propylene Oxide	3.5E-11	3.5E-11	3.5E-11	1.0E-10
TOTAL	4.5E-07	4.6E-07	4.5E-07	1.4E-06

PMI = point of maximum impact, cancer PMI located approximately 1900 feet southeast of the site (Rec. #9645)

CUMULATIVE IMPACTS

The applicant has contacted the SJVAPCD to obtain information regarding existing and planned facilities within a 6-mile radius that may contribute to a public health cumulative impact. Staff has found, howver, that while **AIR QUALITY** cumulative impacts can occur with sources within a 6-mile radius, cumulative public health impacts are not significant unless the emitting sources are extremely close to each other, with a few blocks, not miles. The SJVAPCD reported only two faciltities that meet this criterium of extremely close proximity:

- **Existing APP.** The existing APP, adjacent to the proposed A2PP, would experience a reduction in operation (Response to DR 2 and 15, CH2M2009f). However, the existing APP stationary sources included in A2PP's analysis of cumulative impacts is based on current operational patterns.
- **Winco Foods.** 1) Proposed a 480 hp Caterpillar Model C9 Tier 3 certified diesel-fired emergency standby IC engine powering an electric generator. 2) Proposed a 1,372 hp Caterpillar Model C32 Tier 2 certified diesel-fired emergency standby IC engine powering an electric generator, respectively.

The applicant's cumulative HRA included TAC emissions from the three CTGs proposed for the A2PP project in addition to the existing Almond Power Plant CTG and diesel-fueled emergency fire pump. The applicant's analysis did not include the proposed emergency standby diesel generators for the Winco Foods site. Results of the cumulative HRA using the maximum permitted hours of operation for the emergency fire pump (100 hours) predict a cancer risk of 11.3 in one million, an acute HI of 0.02, and a chronic HI of 0.01 at the point of maximum impact. Using the actual hours of operation of the emergency fire pump (14 hours per year), the maximum cancer risk was calculated to be 1.7 in one million while the chronic and acute HI remained unchanged (TID2009a, Table 5.9-6).

Staff also conducted a cumulative impacts assessment of the existing power plant sources plus the proposed new sources. Staff also did not include the proposed emergency standby diesel generators for the Winco Foods site because of three factors: 1) routine emissions from a standby emergency generator occur only when the diesel engine is tested and maintained at very infrequent intervals during the year and the chances that the Winco generators would be tested on the same days each year as the A2PP emergency fire pump generator is remote; 2) it is entirely unknown when the emergency generators would be needed and for how long; and 3) the emissions for emergency generators that would be used only under loss of power circumstances are not required to be included in a stationary source health risk assessment as per Cal EPA OEHHA rules.

Cancer risk and chronic and acute hazard index values obtained by staff in its cumulative health risk assessment are compared to results reported by the applicant in **Public Health Table 7**.

Public Health Table 7.
Cumulative Cancer Risk and Noncancer Hazard Due to Operation Phase Emissions of New Sources (3 new CTGs) and Existing Sources (1 existing CTG and 1 existing diesel fire pump).

	Staff's Analysis			Applicant's Analysis *(AFC Table 5.9-6)*		
	Cancer Risk (per million)	Acute HI	Chronic HI	Cancer Risk (per million)	Acute HI	Chronic HI
Risk/hazard from all sources at cumulative PMI	8.9	0.018	0.010	11.3	0.02	0.01
Risk/hazard from all sources at project PMI	2.0	0.014	0.0094	n/a	n/a	n/a
MEIR (cum)	0.11	0.0049	0.00051	n/a	n/a	0.01
MEIW (cum)	0.26	0.014	0.0094	1.7	n/a	n/a
Nearest sensitive receptor (cum)	0.031	0.0024	0.00015	n/a	n/a	n/a

- *PMI for cumulative analysis = point of maximum impact. Cancer PMI located either on-site or at facility boundary (Rec. #13829), chronic hazard PMI located southeast of the site (Rec. #9482), and acute hazard PMI located southeast of the site (Rec. #9965)*
- *PMI for new source analysis = point of maximum impact. Cancer and chronic hazard PMI located southeast of the site (Rec. #9645), and acute hazard PMI located southeast of the site (Rec. #10128)*
- *MEIR = nearest residence located approximately 1500 feet northeast of the site (Rec. #6967 approximated)*
- *MEIW = maximally exposed individual worker located at cancer PMI, risk determined under worker exposure scenario*
- *Nearest sensitive receptor = Sinclear Elementary School, located approximately 5280 feet northeast of the site (Rec. #3849 approximated)*

Public Health Table 8 presents substance- and source-specific cancer risks due to the proposed new sources and the existing sources at the PMI determined for the cumulative analysis (Rec. #13829 which occurs either on-site or on the facility boundary) and at the PMI for the new source analysis (Rec. #9645). Analysis of these tables indicates that at the location of the cumulative PMI, 97% of cancer risk is due to diesel particulate matter emitted from the existing diesel fire pump. At the location of the new source PMI, the new CTGs contribute 67% to the total cancer risk while the existing CTG contributes 19% and the existing diesel fire pump contributes 14%. Additional analysis indicates that 64% of cancer risk at the new source PMI is attributed to emissions of PAHs and 14% to diesel exhaust particulate matter.

Public Health Table 8.
Results of Staff's Analysis: Contribution to Total Cancer Risk by Individual Substances from New and Existing Sources.

Contribution to Risk at the Cumulative PMI (Receptor #13829):

Substance	New CTG 1	New CTG 2	New CTG 3	Existing CTG	Existing Diesel Fire pump	Total Cancer Risk
1,3-Butadiene	2.77E-09	3.54E-09	4.12E-09	1.36E-11		1.04E-08
Acetaldehyde				2.09E-11		2.09E-11
Benzene	2.46E-10	3.14E-10	3.66E-10	6.29E-11		9.89E-10
B[a]anthracene	3.35E-09	4.28E-09	4.99E-09	4.59E-10		1.31E-08
B[a]P	2.07E-08	2.65E-08	3.08E-08	2.82E-09		8.08E-08
B[b]fluoranthene	1.68E-09	2.15E-09	2.50E-09	2.29E-10		6.57E-09
B[k]fluoranthene	1.63E-09	2.09E-09	2.43E-09	2.23E-10		6.38E-09
Chrysene	3.75E-10	4.79E-10	5.58E-10	5.11E-11		1.46E-09
D[a,h]anthracene	1.21E-08	1.54E-08	1.79E-08	1.65E-09		4.70E-08
Ethyl Benzene	1.44E-12	1.84E-12	2.14E-12	1.46E-11		2.00E-11
Formaldehyde	2.59E-10	3.31E-10	3.86E-10	7.81E-10		1.76E-09
In[1,2,3-cd]pyrene	3.48E-09	4.45E-09	5.18E-09	4.77E-10		1.36E-08
Naphthalene	1.19E-08	1.52E-08	1.77E-08	8.19E-12		4.48E-08
Propylene Oxide	4.50E-12	5.75E-12	6.69E-12	1.98E-11		3.67E-11
DieselExhPM					8.63E-06	8.63E-06
TOTAL	5.84E-08	7.47E-08	8.70E-08	6.83E-09	8.63E-06	8.86E-06

Contribution to Risk at the New Source PMI (Receptor #9645):

Substance	New CTG 1	New CTG 2	New CTG 3	Existing CTG	Existing Diesel Fire pump	Total Cancer Risk
1,3-Butadiene	2.14E-08	2.18E-08	2.17E-08	7.61E-10		6.56E-08
Acetaldehyde				1.17E-09		1.17E-09
Benzene	1.90E-09	1.93E-09	1.93E-09	3.53E-09		9.29E-09
B[a]anthracene	2.59E-08	2.63E-08	2.62E-08	2.58E-08		1.04E-07
B[a]P	1.60E-07	1.63E-07	1.62E-07	1.58E-07		6.43E-07
B[b]fluoranthene	1.30E-08	1.32E-08	1.32E-08	1.29E-08		5.23E-08
B[k]fluoranthene	1.26E-08	1.29E-08	1.28E-08	1.25E-08		5.08E-08
Chrysene	2.89E-09	2.95E-09	2.94E-09	2.87E-09		1.16E-08
D[a,h]anthracene	9.30E-08	9.47E-08	9.44E-08	9.27E-08		3.75E-07
Ethyl Benzene	1.11E-11	1.13E-11	1.13E-11	8.20E-10		8.54E-10
Formaldehyde	2.00E-09	2.04E-09	2.03E-09	4.39E-08		4.99E-08
In[1,2,3-cd]pyrene	2.69E-08	2.74E-08	2.73E-08	2.68E-08		1.08E-07
Naphthalene	9.18E-08	9.34E-08	9.31E-08	4.60E-10		2.79E-07
Propylene Oxide	3.47E-11	3.53E-11	3.52E-11	1.11E-09		1.22E-09
DieselExhPM					2.89E-07	2.89E-07
TOTAL	4.51E-07	4.59E-07	4.58E-07	3.84E-07	2.89E-07	2.04E-06

PMI for cumulative analysis = located either on-site or at facility boundary (Rec. #13829)
PMI for new source analysis located southeast of the site (Rec. #9645)

Staff concludes that since the contribution of the A2PP project to both cancer risk and chronic and acute noncancer disease are comparatively very small, no significant cumulative impact to public health would exist. Furthermore, even in a cumulative context including the existing Almond Power Plant, the upper-bound estimates for cancer risk from the A2PP project are less than significant. In addition, A2PP's contribution to chronic and acute noncancer disease is less than significant in a cumulative context.

COMPLIANCE WITH LORS

Staff has considered the minority population as identified in **Socioeconomics Figure 1** in its impact analysis and has found no potential significant adverse impacts for any receptors, including environmental justice populations. In arriving at this conclusion, staff notes that its analysis complies with all directives and guidelines from the Cal/EPA Office of Environmental Health Hazard Assessment and the California Air Resources Board. Staff's assessment is biased toward the protection of public health and takes into account the most sensitive individuals in the population. Using conservative (health-protective) exposure and toxicity assumptions, staff's analysis demonstrates that members of the public potentially exposed to toxic air contaminant emissions of this project - including sensitive receptors such as the elderly, infants, and people with pre-existing medical conditions - will not experience any acute or chronic significant health risk or any significant cancer risk as a result of that exposure. Staff believes that it incorporated every conservative assumption called for by state and federal agencies responsible for establishing methods for analyzing public health impacts. The results of that analysis indicate that there would be no direct or cumulative significant public health impact to any population in the area. Therefore, given the absence of any significant health impacts, there are no disparate health impacts and there are no environmental justice issues associated with **PUBLIC HEALTH**.

Staff concludes that construction and operation of the A2PP will be in compliance with all applicable LORS regarding long-term and short-term project impacts in the area of **PUBLIC HEALTH**.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

None Received.

CONCLUSIONS

Staff has analyzed potential public health risks associated with construction and operation of the A2PP and does not expect any significant adverse cancer, short-term, or long-term health effects to any members of the public, including low income and minority populations, from project toxic emissions. Staff also concludes that its analysis of potential health impacts from the proposed A2PP uses a conservative health-protective methodology that accounts for impacts to the most sensitive individuals in a given population, including newborns and infants. According to the results of staff's

health risk assessment, emissions from the A2PP would not contribute significantly or cumulatively to morbidity or mortality in any age or ethnic group residing in the project area.

PROPOSED CONDITIONS OF CERTIFICATION

None proposed.

REFERENCES

BAAQMD (Bay Area Air Quality Management District). 2004b. Toxic Air Contaminant Control Program Annual Report 2002. Volume I. June.

California Air Resources Board (CARB) 2009. Annual Toxics Summaries. <http://www.arb.ca.gov/adam/toxics/toxics.html>.

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

CH2MHILL2009a – CH2MHILL/S. Madams (tn:51503). Air Quality Modeling & Screening Health Risk Assessment Files. Dated 5/11/09. Submitted to CEC/Docket Unit on 5/11/09.

CH2MHILL2009e – CH2MHILL/ S. Madams (tn: 53213). Data Response Set 1A, Air Modeling Files. Dated 9/14/09. Submitted to CEC/Docket Unit on 9/14/09.

CH2MHILL2009f – CH2MHILL/ S. Madams (tn: 53225). Data Response Set 1A, Response to CEC Staff Request 1-84 & Staff Query 1. Dated 9/14/09. Submitted to CEC/Docket Unit on 9/14/09.

OEHHA (Office of Environmental Health Hazard Assessment). 2003. *Air Toxics Hot Spots* Program *Risk Assessment Guidelines*. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. August.

SRP (Scientific Review Panel on Toxic Air Contaminants). 1998. Findings of the Scientific Review Panel on The Report on Diesel Exhaust as adopted at the Panel’s April 22, 1998, meeting.

TID2009a –Turlock Irrigation District/ R. Baysinger (tn: 51502). Application for Certification, Volume 1& 2. Dated 5/11/09. Submitted to CEC/Docket Unit on 5/11/09.

SOCIOECONOMICS

Testimony of Kristin Ford

SUMMARY OF CONCLUSIONS

Staff concludes that construction and operation of the Almond 2 Power Plant (A2PP) would not cause significant direct, indirect, or cumulative adverse socioeconomic impacts on the study area's housing, schools, law enforcement, and parks. Staff also concludes that the project would not induce substantial growth or concentration of population, substantial increases in demand for housing or public services, or displace a large number of people.

INTRODUCTION

Staff's socioeconomics impact analysis evaluates the project's induced changes on existing population and employment patterns, and community services. Staff discusses the estimated impacts of the construction and operation of the A2PP Application for Certification (AFC) on local communities, community resources, and public services, and provides a discussion of the estimated beneficial economic impacts of the construction and operation of the proposed project.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

SOCIOECONOMICS Table 1 contains socioeconomics laws, ordinances, regulations, and standards (LORS) applicable to the proposed project.

SOCIOECONOMICS Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

California Education Code, Section 17620	The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.
California Government Code, Sections 65996-65997	Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

SETTING

The A2PP plant site is located in the city of Ceres, approximately 2 miles southwest of the Ceres city center. The proposed 4.6 acre project site parcel would be composed of 1.4 acres of the existing 48 MW Almond Power Plant site and 3.2 vacant acres of disturbed industrial land. The project address is 4500 Crows Landing Road, Modesto, California. Although the address indentifies the site as in Modesto, it located within the city limits of Ceres. The city of Modesto is approximately five miles to the north (AFC, 1.1, A2PP, 2009). The entire project site is owned by the Turlock Irrigation District (TID). A WinCo Foods distribution warehouse is located to the west, a farm supply facility is

located to the north, and various industrial facilities are located to the east. The project site was previously used by WinCo as a borrow pit during construction of the WinCo distribution warehouse before being filled and graded to the current site elevation.

Stanislaus County is bordered by Calaveras County to the north, Tuolumne County to the northeast, Mariposa County to the southeast, Merced County to the south, Santa Clara County to the southwest, and San Joaquin/Alameda counties to the northwest. There are nine incorporated cities in Stanislaus County; Ceres, Hughson, Modesto, Newman, Oakdale, Patterson, Riverbank, Turlock and Waterford (AFC, 5.10-1, A2PP, 2009). The closest single-family residences are located approximately 0.3 mile northeast of the project site and the city of Ceres Wastewater Treatment Plant is approximately 0.5 mile east of the project site (AFC, 5.6-1, A2PP, 2009).

Demographic Screening

Staff's demographic screening is designed to determine the existence of a minority or below-poverty-level population or both within a six-mile area of the proposed project site. The demographic screening process is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality, 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses National* (Council on Environmental Quality, 1998). The screening process relies on Year 2000 U.S. Census data to determine levels of minority and below-poverty-level populations.

Minority Populations

According to *Environmental Justice: Guidance Under the National Environmental Policy Act*, minority individuals are defined as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population is identified when the minority population of the potentially affected area is greater than 50% or when one or more U.S. Census blocks in the potentially affected area have a minority population greater than 50%.

The minority population within the six-mile radius of the proposed site is 146,356 persons or about 55% of the total population (see **Socioeconomics Figure 1**). Therefore, staff in several technical areas identified in the Executive Summary of this document, have considered environmental justice in their environmental impact analyses.

Below-Poverty-Level Populations

Staff also identified the below-poverty-level population based on Year 2000 U.S. Census block group data within a six-mile radius of the project site. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old. The below-poverty-level population within a six-mile radius of the A2PP consists of approximately 22% of the total population in that area or approximately 31,078 people.

ASSESSMENT OF IMPACTS

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The socioeconomic resource areas evaluated by staff are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines and shown in **Socioeconomics Table 2**. Staff's assessment of impacts on population, housing, emergency medical services, police protection, schools, and parks and recreation, are based on professional judgments, input from local and state agencies, and the industry-accepted two-hour commute range for construction workers. Typically, substantial long-term relocation due to employment of people from regions outside the study area would have the potential to result in significant adverse socioeconomic impacts. Criteria for subject areas such as utilities, fire protection, water supply, and wastewater disposal are analyzed in the **Reliability**, **Worker Safety and Fire Protection**, and **Water Resources** sections of this document.

SOCIOECONOMICS Table 2
CEQA Environmental Checklist Form

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
POPULATION AND HOUSING —Would the project:				
A. Induce substantial population growth in a new area, either directly or indirectly.				X
B. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
C. Displace substantial numbers of people, necessitating construction of replacement housing elsewhere?				X
PUBLIC SERVICES —Would the project:				
D. Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new of physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Emergency medical services			X	
Police protection			X	
Schools			X	
Parks				X
Other public facilities				X
RECREATION—Would the project:				
Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

DIRECT/INDIRECT IMPACTS AND MITIGATION

Induce Substantial Population Growth

For the purpose of this analysis, staff defines "induce substantial population growth" as workers permanently moving into the project area because of project construction and operation, thereby encouraging construction of new homes or extension of roads or other infrastructure. To determine whether the project would induce population growth, staff analyzes the availability of the local workforce and the population within the region. Staff defines "local workforce" as the Stanislaus, Merced and Santa Clara County Statistical Areas (MSAs). **SOCIOECONOMICS Table 3** shows the historical and projected populations of the study area.

SOCIOECONOMICS Table 3
Historical and Projected Populations

Area	2000 Population	2010(p) Population	2020(p) Population
City of Ceres	34,609	N/A	N/A
Stanislaus County	446,997	559,903	699,144
California	33,873,090	39,049,460	43,851,740
(p) = Projected Source: AFC, Table 5.10-1, A2PP, 2009			

SOCIOECONOMICS Tables 4 and 5 show that the total labor by skill for the Stanislaus, Merced and Santa Clara County MSAs would be more than adequate to provide construction labor for the proposed project.

SOCIOECONOMICS Table 4
Total Labor by Skill in
MSA Annual Average for 2016

Discipline	Stanislaus County MSA	Peak # of Workers for Project Construction by Craft
Plant		
Boilermaker (Structural Iron and Steel Workers)	100	20
Bricklayers/Masons	100	2
Carpenters	1,830	8
Electricians	920	26
Insulation Workers	160	8
Laborers	2000	8
Millrights (Industrial Production Managers)	270	10
Operating Engineers	240	6
Painters	950	3
Pipefitters	550	12
Sheetmetal Workers	240	4
Surveyors	150	3
Teamsters	N/A	4
Total Manual Staff	440	113

(Other Construction and Related Workers)		
Total Contractor Staff (Helpers, Construction Trades)	670	10
Natural Gas Pipeline		
Electricians	920	2
Laborers	2000	10
Operating Engineers	240	6
Painters	950	2
Pipefitters	550	10
Surveyors	150	2
Teamsters	N/A	4
Total Manual Staff (Other Construction and Related Workers)	440	32
Total Contractor Staff (Helpers, Construction Trades)	670	4
Transmission Lines		
Electricians	920	6
Laborers	2000	6
Operating Engineers	240	4
Surveyors	150	2
Teamsters	N/A	2
Total Manual Staff (Other Construction and Related Workers)	440	18
Total Contractor Staff (Helpers, Construction Trades)	670	2

The applicant estimates construction would take place over 12 months, from the third quarter of 2010 to the third quarter 2011. The project construction would require an average of 97 employees per day over the entire 12-month construction period with manpower requirements peaking at approximately 149 workers in month 6 of construction.

Project operation would require 16 full-time employees; 4 new full-time employees and 12 current full-time employees at the Almond Power Plant. The workers are expected to commute to the project site from surrounding communities from Merced, San Joaquin and Santa Clara counties. Given the large labor force within two hours commuting time of the project, staff does not expect potential employees to relocate to the immediate project area.

Staff concludes that the construction and operation workforce would not induce substantial growth or concentration of population, and the A2PP would not encourage people to permanently move into the area. The A2PP would have no direct or indirect impact on population growth in a new area.

Housing Supply

As of January 1, 2008, existing housing for Stanislaus County consisted of the following; 139,712 single-family homes, 27,579 multiple-family dwellings and 9,331 mobile homes

(AFC, 5.10-2, A2PP, 2009). There are approximately 47 hotels/motels with 3,332 rooms in Stanislaus County to accommodate workers who may choose to commute to the project site on a workweek basis. Hotel occupancy rates for the period November 2007 through October 2008 averaged about 42% (AFC, 5.10-16, A2PP, 2009). In addition to the available hotel/motel accommodations, recreational vehicle parks are located within the project site vicinity.

Because of the large labor force within commuting distance of the project, staff expects the majority of construction workers would commute to the project daily from their existing residences. No new housing construction would be required.

The project would have four new full-time employees; the applicant expects all four employees would be hired within commuting distance of the project. Given the labor force in Stanislaus County and surrounding counties within commuting distance of the project, staff does not expect employees would relocate to the immediate project area.

Housing in Stanislaus County has fluctuated between a 3.75 to (January 2008) 3.73 rate of vacancy. Ceres' vacancy rate has fluctuated between 3.14 and (January 2008) 3.13%. The housing vacancy rate in the city and county is limited compared to the federal standard vacancy rate of 5%. There are approximately 419 available housing units in Ceres and 6,586 housing units available in Stanislaus County (AFC, Table 5.10-3, A2PP, 2009).

Operation of the A2PP would require four new employees. If all four new employees relocated to Ceres, only four dwelling units would be needed. Staff concludes that the proposed project would not displace any people or necessitate construction of replacement housing elsewhere.

Staff concludes that the construction and operation workforce would not have a significant adverse impact on the housing supply within the immediate project area and the regional areas of Stanislaus, Merced and Santa Clara counties.

Displace Existing Housing and Substantial Numbers of People

The approximately 4.6 acre proposed A2PP project site is composed of disturbed industrial land. West of the project site boundary is a WinCo distribution warehouse. An approximately 1.85-acre unpaved area of WinCo's property north of the project site would be used as a project construction laydown area. North of the project site boundary is farm supply facility; east is various industrial facilities and a railroad line owned by Union Pacific Railroad is aligned along the eastern boundary of the project site.

Land within a 1-mile radius of the proposed project is located within the City of Ceres and Stanislaus County. The lands are primarily agricultural fields and almond orchards (west, south, and east of the project site), single –family residences (northeast of the project site), and a community agricultural center (northwest of the project site). The closest single-family residences are located approximately 0.3 mile northeast of the project. The City of Ceres Wastewater Treatment Plant is approximately 0.5 mile east of the project site (AFC, A2PP, 5.6-1, 2009).

The power plant and construction laydown area are zoned “Planned Community (PC)-50” by the City of Ceres. In addition, the power plant and construction laydown area, are designated as General Industrial by the City of Ceres General Plan (AFC, A2PP, 5.6-22)

The proposed project would be located in an existing industrial area with outlying agriculture land uses. Because A2PP proposes to add 3.2 acres to and existing 1.4 acre existing power plant, and the 4.6 acres would be located within a primarily industrial area, there would be no displacement of existing housing or necessitate construction of replacement housing elsewhere.

Result in Substantial Physical Impacts to Government Facilities

As discussed under the subject headings below, the A2PP would not cause significant impacts to service ratios, response times, or other performance objectives relating to emergency medical services, law enforcement, or schools. Fire protection, including the applicant’s proposed onsite Fire Protection and Prevention Plan, is analyzed in the **Worker Safety and Fire Protection** section of this document.

Emergency Medical Services

As stated in the AFC and verified by staff, the project site is within the Ceres Emergency Services – Fire Division (CFD) jurisdiction (http://www.ci.ceres.ca.us/3092.html). The CFD has a staff of 30 full-time personnel and four stations. The primary responding fire station, Station #3, is approximately 0.3 mile to the east of the proposed project site. Response time to an emergency at the proposed project site from Station #3 is approximately two to three minutes during the day and two to four minutes during the night (AFC, 5-16-16 & 5.10-11, A2PP, 2009).

The nearest hospital with emergency services is Memorial Medical Center in Modesto, which is approximately 8 miles from the proposed A2PP site. Memorial Medical Center is a Level II trauma center which is equipped to handle industrial incidents and has a full helipad should the incident require transfer to another hospital. Serious burns would require transfer to the Bay Area and/or Sacramento (AFC, 5.10-11, A2PP, 2009).

As discussed in AFC Sections 2.0, **Project Description**, 5.18, **Worker Safety and Fire Protection**, and 5.6, **Hazardous Materials Handling**, the A2PP would be designed to meet all applicable standards to reduce the risk of an accidental hazardous materials release and operate in a manner that complies with safety standards and practices to provide a safe workplace for plant personnel.

The applicant’s proposed safety procedures and employee training would minimize potential unsafe work conditions and the need for outside emergency medical response. Staff concludes that the emergency medical services provided by Ceres Emergency Services - Fire Division and Medical Center would be adequate during construction and operation. Thus, the project would not require construction of new or physically altered emergency medical facilities.

Law Enforcement

The A2PP proposed project site within the jurisdiction of the Ceres Public Safety Department – Police Division (CPD) (http://www.ci.ceres.ca.us/3091.html). The CPD has one station, which is located approximately 2.1 miles from the A2PP site. There are approximately 57 full-time officers. The CPD's response time would be six to twelve minutes for more serious incidents and 26 to 27 minutes for less serious incidents. Mutual aid response would come from the Stanislaus County Sheriff. The Stanislaus County Sheriff Central Area Command serves the unincorporated areas north of Keyes Road, west of Geer Road, south of the Tuolumne River, and West of Dale Road. The Central Area Command station is located approximately 1.18 miles from the proposed project site (http://www.stanislaussheriff.com).

The California Highway Patrol (CHP) is the primary law enforcement agency for state highways and roads. Services include law enforcement, traffic control, accident investigation and the management of hazardous material spill incidents. The nearest CHP office is located approximately 12.2 miles (http://www.chp.ca.gov) from the project site in Modesto, California.

In comparison to residential or commercial developments, power plants do not attract large numbers of people and thus require little in the way of law enforcement. Because of this factor and the proposed onsite safety and security measures, staff concludes that the existing law enforcement resources would be adequate to provide services to the A2PP during construction and operation. Thus, the project would not require new or physically altered law enforcement facilities.

Education

There are 26 school districts located within the Stanislaus County Board of Education. The A2PP site is located with the Ceres Unified School District (CUSD). Historical enrollments for grade levels kindergarten through twelfth grade for the school years of 2005-06 were 10,896, 2006-07 were 11,885, and 2007-08 were 12,476 students. Current enrollment figures for the 2008-09 school year were 12,245, with declines in almost every grade (AFC, Table 5.10-6, A2PP, 2009).

During construction, staff expects the labor force would commute daily from the region. Due to the commuting habits of construction workers, staff does not expect any construction workers to relocate their families to the area. Thus, the proposed project would not require construction of new or physically altered school facilities.

A total of four new workers are needed to operate the A2PP. As previously stated, the applicant expects to hire the operation workforce from within the area and no operation workers are expected to relocate with their families. However, if all four new operation workers relocate within Ceres School District, an average family size of 3.03 persons per household (U.S. Census Bureau, Household and Families, 2000 for Stanislaus County) would result in the addition of approximately four children to the local schools.

As previously noted in **SOCIOECONOMICS Table 1**, other than the requirement authorized under Section 17620 of the Education Code, the Energy Commission cannot impose developer fees to mitigate the cost of school facilities. Because the proposed

project would be located on property owned by the Turlock Irrigation District, the A2PP would be exempt from paying school impact fees to Ceres Unified School District.

Given the small number of students who potentially could relocate to schools within the CUSD, staff does not expect the construction or operation of the project to have a significant adverse impact on schools.

Increase the Use of Existing Recreation Facilities

The Stanislaus County Department Parks and Recreation maintains a variety of community parks, off-road parks, fishing assesses and special activities. The community parks amenities include swimming pools, picnic tables, baseball/softball fields, basketball courts, fishing, community centers, playgrounds, walking trails and barbeques (http://www.stancounty.com/er/parks/index.shtm).

Given the labor force and two hour commuting time within Stanislaus, Merced and Santa Clara counties, staff does not expect employees to relocate to the immediate project area. Staff concludes that there are a number and variety of parks within the regional project area and the project would not require construction of new parks nor substantially increase the use of existing parks. Therefore, the construction and operation workforce would not have a significant adverse impact on parks and recreation.

CUMULATIVE IMPACTS

A project may result in significant adverse cumulative impacts when its effects are cumulatively considerable; that is, when the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects [*Public Resources Code* Section 21083; *California Code of Regulations*, Title 14, Sections 15064(h); 15065 (c); 15130; and 15355]. Mitigation requires taking feasible measures to avoid or substantially reduce the impacts.

In a socioeconomic analysis, cumulative impacts could occur when more than one project in the same area has an overlapping construction schedule, thus creating a demand for workers that cannot be met locally. An increased demand for labor could result in an influx of non-local workers and their dependents, resulting in a strain on housing, schools, parks and recreation, law enforcement, and emergency services.

As shown in **SOCIOECONOMICS Table 5,** the total construction labor force by MSA for the region is more than sufficient to accommodate the labor needs for construction of power generation facilities and other large industrial projects. Because of the robust local and regional construction labor force, staff does not expect an influx of non-local workers and their dependents to the project area. Therefore, staff does not expect any significant and adverse impacts on housing, schools, parks and recreation, law enforcement, and emergency services. Staff does not expect construction or operation of the A2PP to contribute to any significant adverse cumulative socioeconomic impacts.

SOCIOECONOMICS Table 5
Occupational Employment Projections by MSA

Construction and Extraction Occupations for Selected MSAs	Average Annual Employment for 2006	Average Annual Employment for 2016
Stanislaus County MSA	13,300	12,090
Merced County MSA	3,740	3,180
Santa Clara County MSA ‘ (Part of San Jose-Santa Clara-Sunnyvale)	50,960	53,480
Source: EDD 2009 Projections of Employment by Industry and Occupation		

NOTEWORTHY PUBLIC BENEFITS

Noteworthy public benefits include the direct, indirect, and induced impacts of a proposed power plant. For example, the dollars spent on or resulting from the construction and operation of the A2PP would have a ripple effect on the local economy. This ripple effect is measured by an input-output economic model. The model relies on a series of multipliers to provide estimates of the number of times each dollar of input or direct spending cycles through the economy in terms of indirect and induced output, or additional spending, personal income, and employment. The typical input-output model used by economists and the one used for this analysis by the applicant is the IMPLAN model. IMPLAN multipliers indicate the ratio of direct impacts to indirect and induced impacts. Staff reviewed the results of the IMPLAN model and found them to be reasonable considering data provided by the applicant as well as data obtained by staff from governmental agencies, trade associations, and public interest research groups. TID owners would employ workers and purchase supplies and services for the life of the A2PP. Employees would use salaries and wages to purchase goods and services from other businesses. Those businesses make their own purchases and hire employees, who also spend their salaries and wages throughout the local and regional economy. This effect of indirect (jobs, sales, and income generated) and induced (employees’ spending for local goods and services) spending continues with subsequent rounds of additional spending, which is gradually diminished through savings, taxes, and expenditures made outside the area.

For purposes of this analysis, direct impacts were said to exist if the project resulted in permanent jobs and wages; indirect impacts, if jobs, wages, and sales resulted from project construction; induced impacts, from the spending of wages and salaries on food, housing, and other consumer goods, which in turn creates jobs. Indirect and induced economic impacts from construction would take place over 12 months, from the third quarter of 2010 to the third quarter 2011. Indirect and induced economic impacts from operation would begin in the fourth quarter of 2011. All indirect and induced operation impacts would result from annual operations and maintenance expenditures. All construction and operation impacts would take place within Stanislaus County. The economic benefits of the proposed project, as required by the Energy Commission regulations and resulting from the IMPLAN model are shown below in **Socioeconomics Table 6**.

Table 6, A2PP Economic Benefits (2008 dollars)	
Fiscal Benefits	
Estimated annual property taxes	Exempt
State and local sales taxes: Construction	$73,750 - $147,500
State and local sales taxes: Operation	$110,625
School Impact Fee	Exempt
Non-Fiscal Benefits	
Total capital costs	$200 million
Construction payroll	$7.56 million
Annual Operations and Maintenance	
Construction materials and supplies	$175 million
Operations and maintenance supplies	$1.8 million
Direct, Indirect, and Induced Benefits	
Estimated Direct	
Construction	97 jobs
Operation	4 full-time positions
Estimated Indirect	
Construction Jobs	33
Construction Income	$556,020
Operation Jobs	26
Operation Income	$1,072,600
Estimated Induced	
Construction Jobs	38
Construction Income	$1,130,290
Operation Jobs	10
Operation Income	$326,600
Source: AFC, A2PP, 5.10 Socioeconomics.	

PROPERTY TAX

The Almond 2 Power Plant would be owned and operated by Turlock Irrigation District (TID). TID is a public agency which is governed by a Board of Directors and elected by its ratepayer-owners. TID is exempt from property taxes.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no agency or public socioeconomic comments on this project.

CONCLUSIONS

Estimated gross public benefits from the A2PP include employment and income for the project area and region. Staff concludes that construction and operation of the A2PP would not cause significant direct, indirect or cumulative adverse socioeconomic impacts on the study area's housing, schools, law enforcement, emergency services and parks.

Staff concludes that the project would not cause significant direct or cumulative adverse impacts to emergency services. Staff also concludes that the A2PP would not induce substantial growth or concentration of population; induce substantial increases in demand for housing or public services; or displace a large number of people.

REFERENCES

California Highway Patrol, http://www.chp.ca.gov

Ceres Emergency Services – Fire Division, http://www.ci.ceres.ca.us/3092.html

Ceres Public Safety Department – Police Division, http://www.ci.ceres.ca.us/3091.html

Stanislaus County Department Parks and Recreation, http://www.stancounty.com/er/parks/index.shtm

Stanislaus County Sheriff, Central Area Command, http://www.stanislaussheriff.com

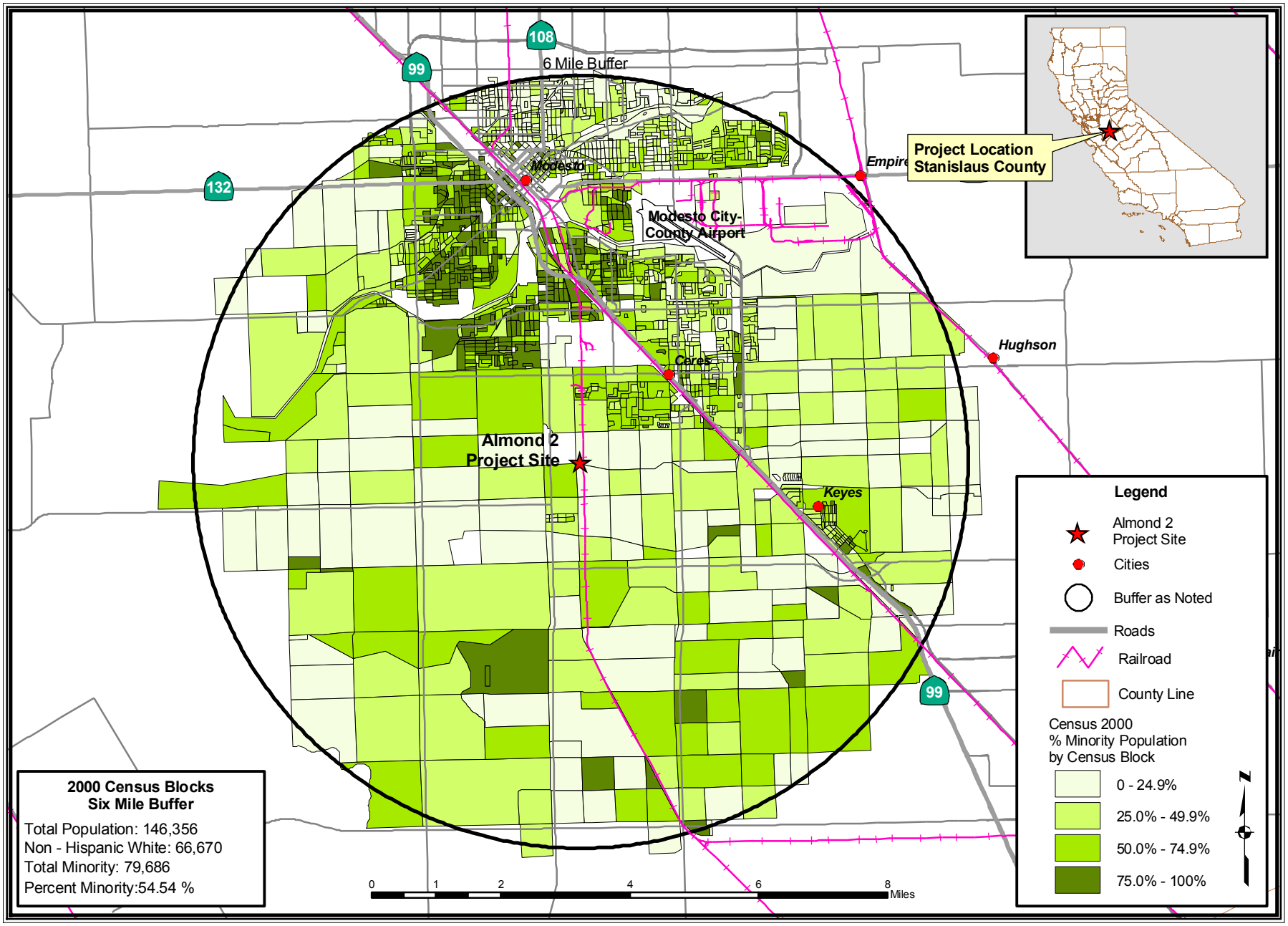
State of California, Department of Finance Demographic Research Unit, Table 2: E-5 City/County Population and Housing Estimates, 1/1/2009.

State of California, Employment Development Department (EDD) 2009. Labor Market Information, Occupational Employment Projections 2006-2016 Riverside and San Bernardino County Metropolitan Statistical Areas (MSAs).

U. S. Environmental Protection Agency (EPA), Office of Federal Activities. 1998. Final Guidelines for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance.

SOCIOECONOMICS - FIGURE 1

Almond 2 Power Plant Project - Census 2000 Minority Population by Census Block - Six Mile Buffer



SOCIOECONOMICS

CALIFORNIA ENERGY COMMISSION, ENERGY FACILITIES SITING DIVISION

SOURCE: California Energy Commission Statewide Power Plant Maps 2010 - Census 2000 PL 94-171 Data - Matrix PL2

SOIL & WATER RESOURCES

Testimony of Vince Geronimo, PE and Rachel Cancienne, EIT

SUMMARY OF CONCLUSIONS

This section of the Staff Assessment (SA) analyzes the potential effects on soil and water resources that would occur by construction and operation of the proposed Turlock Irrigation District's (TID) Almond 2 Power Plant (A2PP) project. Based on its assessment of the proposed A2PP Project, staff concludes the following:

- Implementation of Best Management Practices (BMPs) during A2PP construction and operation in accordance with effective Storm Water Pollution Prevention Plans (SWPPP) and a Drainage, Erosion and Sedimentation Control Plan (DESCP) would avoid significant adverse effects that could be caused by transport of sediments or contaminants from the A2PP site and associated linear facilities by wind or water erosion.
- The proposed reclaimed water supply for the project would not cause a significant adverse environmental impact on current or future users of the water supply.
- The Waste Discharge Requirements for the City of Ceres Wastewater Treatment Plant may be revised by the Central Valley Regional Water Quality Control Board during the life of the project, which could affect both the water supply and wastewater disposal for the A2PP site.
- The proposed project would be constructed to comply with 100-year flood requirements and would not exacerbate flood conditions in the vicinity of the project.
- The proposed project would comply with all applicable federal, state, and local laws, ordinances, regulations and standards with the adoption of the recommended conditions of certification.
- A2PP would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources with adoption of the conditions of certification.
- The project complies with the state water policies by using reclaimed water.

Staff concludes that A2PP would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources and would comply with all applicable laws, ordinances, regulations and standards (LORS) if all of the recommended conditions of certification are adopted by the Commission and implemented by TID.

INTRODUCTION

This section of the Assessment (SA) analyzes the potential effects on soil and water resources by the proposed TID Almond 2 Power Plant (A2PP). This analysis specifically focuses on the potential for A2PP to:

- cause accelerated wind or water erosion and sedimentation;

- exacerbate flood conditions in the vicinity of the project;
- adversely affect surface or groundwater supplies;
- degrade surface or groundwater quality; and
- comply with all applicable laws, ordinances, regulations and standards (LORS) and State policies.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

Soil and Water Resources Table 1
Laws, Ordinances, Regulations, and Standards (LORS) and Policies

Federal	
Clean Water Act/Water Pollution Control Act. P.L. 92- 500, 1972; amended by Water Quality Act of 1987, P.L. 100-4 (33 USC 466 et seq.); NPDES (CWA, Section 402)	The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. This includes regulation of storm water discharges during construction and operation of a facility normally addressed through a general National Pollutant Discharge Elimination System (NPDES) permit.
Natural Resources Conservation Service (NRCS), National Engineering Handbook, Sections 2 and 3 (1983)	Sections 2 and 3 of the USDA-NRCS National Engineering Handbook (1983) provide standards for soil conservation and erosion prevention during construction activity.
State	
California Constitution, Article X, Section 2	The State Constitution requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited.
Porter Cologne Water Quality Control Act (PCWQCA) (Water Code §13000 et seq.)	PCWQCA requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These standards are typically applied to the proposed project through the Waste Discharge Requirements (WDR) permit. These regulations require that the RWQCB issue Waste Discharge Requirements specifying conditions regarding the construction, operation, monitoring and closure of waste disposal sites, including injection wells and evaporation ponds for waste disposal. WDRs are updated periodically to reflect changing technology standards and conditions.
SWRCB Res. 2009-0011 (Recycled Water Policy)	This policy supports and promotes the use of recycled water as a means to achieve sustainable local water supplies and reduction of greenhouse gases. This policy encourages the beneficial use of recycled water over disposal of recycled water. This policy states the following recycled water use goals: • "Increase the use of recycled water over 2002 levels by at least one million acre-feet per year (AF/y) by 2020 and by at least two million AF/y by 2030; • Increase the use of stormwater over use in 2007 by at least 500,000 AF/y by 2020 and by at least one million AF/y by 2030; • Increase the amount of water conserved in urban and industrial uses by comparison to 2007 by at least 20% by 2020; and Included in these goals is the substitution of as much recycled water for potable water as possible by 2030."

SWRCB Resolution 75-58	The SWRCB has adopted policies that provide guidelines for water quality protection. The principal policy of the SWRCB that specifically addresses the siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 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. This policy also includes cooling water discharge prohibitions such as land application.
California Water Code (CWC) Section 461	CWC Section 461 addresses the conservation of all available water resources and requires the maximum reuse of reclaimed water in satisfaction of the requirements for beneficial uses of water.
California Water Code (CWC) Section 13550	CWC Section 13550 requires the use of reclaimed water for industrial purposes subject to reclaimed water being available and meeting certain conditions such as the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, and the use is not detrimental to public health.
California Water Code (CWC) Section 13551	CWC Section 13551 limits the use of water with quality suitable for potable domestic use for nonpotable uses if suitable recycled water is available.
California Water Code (CWC) Section 13751	CWC Section 13751 mandates that within 60 days of construction, alteration, abandonment or destruction of a groundwater well a completion report be filed to the appropriate water agency.
Recycling Act of 1991 (Water Code § 13575 et esq.)	The Water Recycling Act of 1991 encourages the use of recycled water for certain uses and establishes standards for the development and implementation of recycled water programs.
Local	
Stanislaus County General Plan; Chapter 7, Agricultural Element	Provides limits for development of agricultural soils.
Stanislaus County Code; Title 13, Streets, Sidewalks, and Public Places	Provides requirements for construction of underground utilities along County roads.
Stanislaus County Code; Title 16, Buildings and Construction	Provides the Building Code for Stanislaus County, including general design standards and an amendment to the California Building Code for grading.
Stanislaus County Code; Title 21, Zoning	Provides information on zoning and outlines the accepted uses for lands under a Williamson Contract.
Stanislaus County Standards and Specifications	Provides the County's minimum requirements for excavation safety, dust controls, earthwork, erosion and pollution prevention, and more.
Stanislaus County Storm Water Management Plan	Regulates Best Management Practices (BMPs) for construction activities.
City of Ceres Municipal Code	Provides requirements for development of land within the City limits and requirements for obtaining permits for water wells. Provides grading requirements and permit information, preliminary soil report requirements, regulates BMPs for construction activities, and gives general design standards.
City of Ceres General Plan; Chapters 4 (Public Utilities and Services) and 6 (Agricultural and Natural Resources)	Policies for water supply and delivery; wastewater collection, treatment, and disposal; stormwater drainage; and water resources.
City of Ceres Improvement Standards	Provides the City's minimum requirements for earthwork and construction activities.

REGIONAL SETTING

REGIONAL WATER RESOURCES

Surface Waters

The proposed project site is located within the lower San Joaquin Valley in Stanislaus County in the City of Ceres, California. Major surface water bodies in Stanislaus County include the Stanislaus and Tuolumne Rivers which terminate in the San Joaquin River west of project site. The project site is approximately 3 miles south of the Tuolumne River and approximately eight miles to the east of the San Joaquin River.
The Central Valley Regional Water Quality Control Board (RWQCB) implements water quality regulations in the Ceres area, which include: setting water quality standards, issuing waste discharge requirements, determining compliance with those requirements, and taking appropriate enforcement actions. Each RWQCB adopts a water quality control plan, or Basin Plan, which establishes water quality objectives to ensure the reasonable protection of beneficial uses and a program of implementation for achieving water quality objectives within their basin. Water quality objectives for the Tuolumne and San Joaquin rivers are contained in the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) (CVRWQCB1998). The lower Tuolumne River between Don Pedro Reservoir and the San Joaquin River, as well as the San Joaquin River between the Merced and Tuolumne tributaries are considered impaired water bodies per the Basin Plan. Ceres, CA is located between the Merced River and Tuolumne River along Hwy 99.

Climate

Average annual rainfall is about 12 inches in the City of Modesto, just north of the project site. Most of the precipitation occurs between November and April, while the summer months are virtually rainless. **Soil and Water Resources Table 2** provides average historical rainfall from the meteorological station in Modesto.

Soil and Water Resources Table 2
Average Rainfall near the Proposed Project Site (1906-2007)

Precipitation	Annual	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Average	12.20	0.62	1.24	2.06	2.47	2.06	1.93	1.02	0.45	0.12	0.02	0.04	0.17

Source: WRRC2009

Groundwater

The A2PP project site is located within the Turlock Subbasin of the San Joaquin Valley Groundwater Basin. The Turlock Subbasin lies between the Tuolumne and Merced Rivers and is bounded on the west by the San Joaquin River and on the east by the basement rock of the Sierra Nevada foothills. The subbasin shares its northern, western, and southern boundaries with the Modesto, Delta-Mendota, and Merced Groundwater Subbasins, respectively. Groundwater in the Turlock Subbasin flows primarily to the southwest following the regional dip of basement rock and sedimentary units towards the San Joaquin River (DWR2006).

Groundwater levels in the Turlock Subbasin have steadily declined over time, with a steep decline of approximately 15 feet between 1970 and 1992. The primary hydrogeologic units in the Turlock Subbasin include both consolidated and unconsolidated sedimentary deposits. Well yields in the Turlock Subbasin range from 200 to 4,500 gallons per minute, with an average yield of 1,000 to 2,000 gallons per minute. Well depths in the subbasin range from 50 to 350 feet (DWR2006). Groundwater in the Turlock Subbasin is of the sodium-calcium bicarbonate type and has total dissolved solids values ranging from 100 to 930 milligrams per liter (mg/L) throughout the subbasin. There are localized areas of hard groundwater, nitrate, chloride, boron, and dibromochloropropane (DBCP); however, unless otherwise designated by the Central Valley RWQCB, all ground waters are considered suitable for municipal and domestic water supply, agricultural supply, and industrial service and process supply (DWR2006).

PROJECT, SITE, AND VICINITY DESCRIPTION

The proposed A2PP would be a natural gas-fired, simple-cycle peaking facility rated at a gross generating capacity of 174 megawatts (MW). The project site is a 4.6-acre parcel near Ceres, California. The site is located on land owned by TID and is adjacent to the existing TID Almond Power Plant (APP) to the south. A2PP would be operated in tandem with the existing APP. Based on the applicant's AFC, oral responses to questions asked during the public workshop held on Sept. 22, 2009, and written Data Responses, staff believes that all existing facilities in APP that would be shared between sites, discussed herein, are adequate for the A2PP expansion. A WinCo distribution warehouse sits to the west, a farm supply facility to the north, and a modular building distributor and drilling equipment storage facility to the east. In addition to the A2PP site, the project includes an approximately 1.85-acre laydown and parking area to the north of the project site. The project includes a new 11.6-mile long natural gas pipeline, two transmission corridors (0.9 and 1.2 miles long with 0.0066 and 0.0092 acre, respectively, required for pole footprints), and the reconductoring of an existing 69-kV transmission line (TID2009a and CH2MHILL2009k).

Water Supply during Construction

During construction, workers would utilize the existing fire system on the APP site, which is supplied via groundwater from the well on the APP site, or pump and truck fresh water to the A2PP site from the TID irrigation canal to the south. Construction of the A2PP project is scheduled to last 12 months. The entire project site, approximately 4.6 acres, would be graded during construction. Construction water would be required primarily for dust suppression. The average daily water use for construction would be 36,000 gallons per day and daily maximum water use would be 144,000 gallons per day. The average water use for the 12-month construction period would be 13.14 million gallons (40.3 acre feet (AF)); maximum would be 52.56 million gallons (161.3 AF).

Project Water Supply

Project water use would be for combustion turbine air inlet evaporative cooling, SPRay INTer-cooling water injection (SPRINT feature of the LM6000 Sprint) for power augmentation, combustion turbine water injection for control of oxides of nitrogen, and turbine washing. A2PP process water would be supplied to the site via the existing water delivery system used for APP. Water for APP is pumped from approximately 35 to

65 feet below ground surface near the City of Ceres Waste Water Treatment Plant (WWTP) percolation-evaporation (P-E) basins. Water is delivered to the power plant site via a 6-inch diameter pipeline between the APP and the City of Ceres WWTP. A2PP's average daily water use would be approximately 459,360 gallons of water per day (gpd) assuming 60ºF (see **Soil and Water Resources Table 3**). The power plant would use about 293 acre-feet of process water per year assuming typical expected operation of 5,000 hours per year (57% capacity factor) and average daily temperatures. The case for operating 8,760 hours per year (100% capacity factor) was also evaluated by the applicant. Total water use for this case would be approximately 514 acre-feet per year (AFY), assuming average daily temperatures. When ambient temperatures increase to 110ºF, the expected daily water use increases to 502,560 gpd, which would increase projected annual use values. Staff estimates that the annual increase could not be greater than 50 AFY because the maximum daily use (with a heat balance case of 110°F) equates to approximately 563 AFY.

Soil and Water Resources Table 3
Estimated Maximum and Average Annual Water Use for A2PP Operations

Process and Cooling Water Use Annual Hours of Operation	Projected Annual Use	
	At 60°F (ac-ft)	At 110°F (ac-ft)
2,917 hours per year (33% Capacity)		188
5,000 hours per year	293	

Source: TID2009a

The estimate of 514 AFY would be an upper bound estimate of water use since it is unlikely the project would be operated at 100% capacity. As discussed in the Air Quality section staff agrees with the applicant that although the facility would be allowed to operate at greater than 60% capacity factor if needed, A2PP is not designed or intended to do so. This simple-cycle facility is not expected to operate at greater than 33% capacity factor, and Energy Commission staff experience indicates that this type of facility is only likely to exceed 30% annual capacity factor in an emergency or crisis situation.

Groundwater

The City of Ceres relies on groundwater as its municipal water supply (Ceres1997). The city maintains ten wells, eight of which are active (TID2009a). One of the city's municipal wells is located adjacent to the Ceres WWTP. TID pumps approximately 16,000 gallons per day (gpd) of groundwater from their existing well on the APP site. The groundwater is used for sanitary service water for the APP. A2PP would rely on the existing APP groundwater well, owned and operated by TID, for sanitary service water.

TID owns wells in the vicinity of the Ceres WWTP. The Ceres WWTP pumps groundwater, via TID-owned wells, to maintain the groundwater levels below the crop root zone (about 6 to 10 feet below ground surface). Groundwater extraction is

necessary to lower the local shallow groundwater table and improve percolation at the Ceres WWTP. The extracted water is piped to concrete-lined laterals within the TID network for use by other areas in the district.

The Ceres WWTP is located about one-half mile feet from APP/A2PP. APP currently pumps groundwater extracted near the Ceres WWTP Percolation-Evaporation (P-E) basins for industrial use. The groundwater is best described as reclaimed wastewater infiltrated through the P-E basins. The reclaimed wastewater comes primarily from sanitary wastewater (TID2009a). The wastewater receives primary treatment and is discharged to the Ceres WWTP P-E basins. **Soil and Water Resources Table 4** shows typical concentrations of select harmful constituents in discharge waters of Ceres WWTP (TID2009a). As the wastewater percolates into the ground, the soil acts as a filter for organic material, microorganisms, and nutrients such as nitrogen and phosphorus. The soil-filtered wastewater is pumped via the existing collection well and delivered to APP. A2PP will utilize the same 6" pipeline to deliver process water to the proposed project. The extraction well might also draw as much as 5% of the total water it obtains from adjacent groundwater sources with unknown water quality (CH2MHILL2009g). Prior to use as process and cooling water, the extracted intake water would be filtered through the existing APP reverse osmosis system.

Soil and Water Resources Table 4
Select A2PP Water Quality Constituents

Parameter	Units	Extraction Well Intake[a]	Wastewater Discharge (Peak Flow)[b]	Wastewater Discharge (Average Flow)[c]
Total Dissolved Solids	mg/L	833	2714.6	2380.4
Total Alkalinity ($CaCO_3$)	mg/L	256	822.1	720.8
Nitrate (NO_3)	mg/L	3.6	11.5	10.1
Sodium	mg/L	162	519.8	455.8

[a] Ceres WWTP water quality data
[b] Expected A2PP discharge at 100°F dry bulb temperature
[c] Expected A2PP discharge at 60°F dry bulb temperature
Source: TID2009a

Wastewater Collection, Treatment, Discharge and Disposal

A2PP general plant wastewater from containment area washdown, sample drains, and facility equipment drains, as well as non-reclaimable process wastewater, would be combined with the APP effluent and conveyed to the Ceres WWTP via the existing 6-inch-diameter pipeline from the APP to the Ceres WWTP P-E basins. The wastewater from APP is currently not treated by the Ceres WWTP prior to discharge to the P-E basins. No additional treatment is expected as a result of the increased effluent from A2PP. **Soil and Water Resources Table 4** shows expected concentrations of select contaminants in the A2PP discharge stream under peak and average flows, which are dependent on ambient temperature.

Drains that could potentially contain oil or grease would first be routed through an oil-water separator and hazardous wastewater would be hauled offsite for appropriate disposal. A2PP would utilize the existing onsite septic tank and leach field at APP to manage sanitary wastewater.

Stormwater Runoff and Drainage

The existing APP stormwater system incorporates a series of inlets and drainage pipes that discharge to an onsite retention pond, which is currently situated on the proposed location of A2PP. This existing stormwater system would be resized and relocated to the north to accommodate the A2PP. The stormwater system for the A2PP would include a series of inlets and storm drain pipes that convey rainfall runoff to the new retention pond. The retention pond would be sized for 2.41 acre-feet capacity to accommodate the 100-year runoff volume with 2.65 feet of freeboard (CH2MHILL2009f). Areas of potential oil contamination would use secondary containments that prevent the potential contaminants from entering the stormwater collection system. Drainage from these areas would be contained separate from the stormwater collection system, treated and disposed of offsite.

Soil Resources

In general, soils at the proposed A2PP project site are medium to coarse grained and range between sandy loam and loam sand in texture (USDA-NRCS2008). However, the northern three-quarters of the project site was formerly a borrow area used during the development of the adjacent WinCo facility and, due to the developed, industrial nature of the site, soil conditions could vary significantly from those shown in the NRCS soil survey. Additionally, the southern quarter of the project site is currently used as the retention pond for the existing Almond Power Plant. The pond would be filled to ground level at the beginning of construction with imported soils.

The industrial nature of the site suggests that there has been significant mixing of local soils and that imported construction fill soils have been used beneath foundations and roadways. These imported soils would have to be suitable for engineered structures and roadways, and would be expected to consist of well-graded materials. Imported soils previously used to fill the borrow pit as well as the non-native soil material used to fill the retention basin would not be expected to contain materials that are unsuitable for engineering purposes, such as organic debris or expansive clays.

The proposed A2PP is on land zoned for industrial use. Surrounding land uses include industrial, municipal, residential, and agricultural uses. Proposed linear features would primarily run along existing corridors and rights of way, including roadways, rail lines, and existing transmission lines. Only portions of each of the two new transmission line routes would be constructed on land that is currently in agriculture. Agricultural lands surrounding the project site include several fields of nut trees, including one field of almond trees directly south of APP.

The A2PP laydown area would be located to the immediate north of the proposed project site and would be approximately 1.85 acres in size. Process water and wastewater connections would be located in the existing APP facilities. Natural gas would be provided via a 11.6 mile-long pipeline that would run south along Morgan Road, west along East Zeering Road, south along Bystrum Road and west along West Harding Road , south along an unnamed farm road for 0.3 miles, west through a farm field for 0.5 mile and finally south on an unnamed farm road_msocom_1#_msocom_1 for approximately 0.7 mile to connect to PG&E's existing Line #215 at West Bradbury Road (Figure 1, DR Set 1D, Attachment DR 18-1; CH2MHILL2009k). Two new

transmission lines have been proposed: an approximately 0.9-mile-long 115 kV transmission line (Corridor 1), and an approximately 1.2-mile-long, 115-kV transmission line (Corridor 2) (see Figure 1.1-3; CH2MHILL2009k).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section provides a discussion of the potential direct, indirect, and cumulative impacts to soil and water resources that may result from construction, operation, and maintenance of the proposed A2PP. While all projects would likely have impacts, the goal is to limit any adverse impacts to an insignificant or acceptable level, or to avoid them altogether, if possible. Staff's analysis of potential impacts consists of a brief description of the potential impact, an analysis of the relevant facts, and application of the threshold criteria for significance to the facts. Mitigation measures may be necessary to reduce potentially significant impacts to a level of insignificance. If mitigation is warranted, staff provides a summary of TID's proposed mitigation and a discussion of the adequacy of the proposed mitigation. Where necessary, staff presents additional or alternative mitigation measures or recommends specific conditions of certification related to a potential impact and any required mitigation measures.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff evaluated the potential impacts to soil and water resources including the effects of construction and operation activities that could result in erosion of soils, the deposition of sediments into surface waters or the contamination of either groundwater or surface water. Staff also evaluated the potential of the project's proposed water use to cause a significant depletion or degradation of local and regional water resources.

To evaluate if significant impacts to soil or water resources would occur, staff assessed:

- Whether construction or operation would lead to accelerated wind or water erosion and sedimentation.
- Whether the project would exacerbate flood conditions in the vicinity of the project.
- Whether the project's water use would cause a substantial, or potentially substantial, adverse change in the quantity or quality of groundwater or surface water.
- Whether project construction or operation would lead to degradation of surface or groundwater quality.
- Whether the project would comply with all applicable LORS.

These criteria are based on the California Environmental Quality Act (CEQA) Guidelines and performance standards. The threshold of significance for project impacts is based on the ability of the project to be built and operated without violating applicable erosion, sedimentation, flood, surface or groundwater quality, water supply, or wastewater discharge standards. The federal, state, and local LORS and policies presented in **Soil and Water Resources Table 1** represent the applicable standards used for the A2PP analysis. These LORS support a comprehensive regulatory system, with adopted standards and established practices designed to prevent or minimize adverse impacts

to soil and water resources. For those impacts that exceed standards or result in a significant adverse impact, conditions of certification may be necessary to ensure compliance with standards or reduce the impacts to a less than significant level.

Staff's analysis, determination of potential impacts, and evaluation of appropriate mitigation measures relies on estimates and information provided by TID regarding the construction and operation of A2PP. Applicable scientific, technical, and LORS/policy-related literature and expert opinion was also consulted in the development of staff's analysis.

DIRECT/INDIRECT IMPACTS AND MITIGATION

This direct and indirect impact and mitigation discussion is divided into impacts related to construction and to operation. For each potential impact evaluation, staff briefly describes the potential effect and applies the threshold criteria for significance to its analysis of the project. If mitigation is warranted, staff provides a summary of TID's proposed mitigation and a discussion of the adequacy of the proposed mitigation. In the absence of TID's proposed mitigation or if mitigation proposed by TID is inadequate, staff mitigation measures are recommended. Staff also provides specific conditions of certification related to a potential impact and the required mitigation measures.

Construction Impacts and Mitigation

Construction of A2PP would include soil excavation, grading, installation of utility connections and the use of fresh water, primarily for dust suppression. Potential impacts to soils related to increased erosion or release of hazardous materials are possible during construction. Potential stormwater impacts could result if increased runoff flow rates and volume discharges from the site were to increase flooding offsite. Water quality could be impacted by discharge of eroded sediments from the site, discharge of hazardous materials released during construction, or migration of any existing hazardous materials present in the subsurface soil and groundwater. However, staff does not believe there would be any potential adverse impacts associated with soil and groundwater contamination that would be exacerbated by construction of the proposed A2PP project. Project construction water demand could affect quantity of surface water resources. Potential construction related impacts to soil, stormwater, and water quality or quantity, including the applicant's proposed mitigation measures and staff's proposed mitigation measures are discussed below.

Erosion Control and Stormwater Management

Construction activities for managing erosion and stormwater must be addressed to avoid potential adverse impacts to water quality and soil resources. Accelerated wind and water-induced erosion may result from earth-moving activities associated with construction of the proposed project. Alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Soil erosion can cause the loss of topsoil and can increase the sediment load in surface receiving waters downstream of areas affected by construction activity. Increasing the amount of impervious surfaces would increase the amount of runoff and peak discharges. Runoff from stormwater can also convey contaminants to soil, groundwater, and surface water if hazardous materials and waste are not properly stored, handled, and disposed.

Construction activity would increase short-term soil erosion. With the implementation of Best Management Practices (BMP) including stabilizing construction entrances, applying water for dust suppression, placement of silt fencing, berms, and hay bales as needed, erosion would be reduced to less than significant and water quality would not be adversely affected by runoff from the site.

Staff recommends two conditions, **SOIL&WATER-1** & **-2,** which address mitigation measures designed to reduce any soil erosion and stormwater construction impacts to less than significant levels.

Condition of Certification **SOIL&WATER-1** would require the project owner to comply with all of the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity, including the development and implementation of a Storm Water Pollution Prevention Plan for Construction.

To qualify for the NPDES statewide General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit), prior to construction TID would be required to develop a Construction SWPPP to prevent the offsite migration of sediment and other pollutants, and to reduce the effects of runoff from the laydown sites to offsite areas. Successful implementation of the SWPPP would ensure that construction impacts to soil resources are mitigated to a less-than-significant level. SWPPP procedures include submitting a Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) and developing the SWPPP prior to the start of construction activities. The construction SWPPP would also be submitted to the Stanislaus County Stormwater Management Engineer for review.

The construction sequence of taking the existing operational stormwater retention basin offline and constructing the new retention basin should be described in the Drainage, Erosion, and Sediment Control Plan (DESCP) project schedule recommended by staff in Condition of Certification **SOIL&WATER-2**. Condition of Certification **SOIL&WATER-2** requires the project owner to obtain Compliance Project Manager (CPM) approval for a site-specific final DESCP that addresses all project elements. Compliance with the requirements of this condition would reduce potential soil erosion and stormwater quality impacts to less than significant for the construction phase of the project.

Temporary Erosion Control Measures

Temporary erosion control measures would be implemented at the start of construction, and would be evaluated, inspected and maintained during construction. TID suggests these BMP measures would include silt fences, fiber rolls, and mulching. TID would not utilize temporary stormwater runoff detention or sedimentation basins, drainage diversion, and other large-scale sediment traps due to the relatively small size of the construction site, level topography, and density of paved areas surrounding the site. These temporary erosion control measures would be removed from the site after the completion of construction or converted to permanent BMPs.

During construction of the project, dust erosion control measures would be implemented to minimize the wind-blown loss of soil from the site. TID states that water of a quality

equal to or better than existing surface runoff would be sprayed on the soil in construction areas to control dust.

Sediment barriers slow runoff and trap sediment. TID proposes to place sediment barriers, such as straw bales, sand bags, straw wattles, and silt fences around sensitive areas to prevent contamination by sediment-laden water. They would be placed downstream of disturbed areas, at the base of exposed slopes, and along streets and property lines below the disturbed area.

Since the site would be constructed on relatively level ground, TID would not utilize sediment barriers around the entire perimeter of the site; however, they would place some barriers in locations where onsite to offsite drainage could occur to prevent sediment from leaving the site. TID states that sediment barriers would be properly installed (staked and keyed), then removed or used as mulch after construction. Any soil stockpiles, including sediment barriers around the base of the stockpiles, would be stabilized and covered. Staff believes that with the implementation of BMPs suggested in the draft construction SWPPP and execution of Condition of Certification **SOIL&WATER-1**, temporary erosion control measures would satisfy all applicable LORS and reduce soil and water resources impacts to less than significant.

Laydown Areas

The area proposed for the A2PP construction laydown is approximately 1.85 acres and would be located north of the proposed project site. There are nearly level conditions at the site and laydown areas; however, due to compaction from previous activity on the site, the soils are expected to have slow to very slow permeability (and consequently, high runoff). TID expects the laydown area to be graded within one month and then be immediately covered with gravel or other material to permit wet season use and to prevent subsequent wind erosion losses.

Vehicle traffic and equipment staging would result in soil compaction in the laydown area. Soil compaction increases soil density by reducing soil pore space. This, in turn, exacerbates the ability of the soil to absorb precipitation and transmit gases for respiration of soil microfauna. Soil compaction can result in increased runoff, erosion, and sedimentation. TID proposes to store heavy equipment on dunnage (loose scrap material that provides ventilation) to protect it from ground moisture. Compaction beneath the laydown area can also be mitigated by removing and stockpiling topsoil for later reuse and by deep ripping the subsoil after removing the material and gravel covering. Given the limited area over which permanent compaction would occur, it is considered that this impact would be less than significant. It is also assumed that soil loss would be negligible from the laydown areas once it is covered.

The highest potential for soil loss would occur immediately following grading and prior to the cover material being placed or during the period following the end of construction, when gravel is removed. TID has described the existing laydown area as bare soil and that the laydown area would be returned to its current condition. Given the former construction activity at the site, it is likely that the soil structure in this area may be significantly changed. With the implementation of Conditions of Certification

SOIL&WATER-1 and **SOIL&WATER-2**, staff believes any potential significant adverse impacts caused by erosion or storm water discharge during construction of the project would be mitigated.

Water Supply

The primary use of water for site construction would be dust control. TID would use fresh water from either the onsite fire system at the APP or TID's Lateral #2 irrigation canal for all non-domestic construction water uses. Construction water used for dust control and soil compaction would not result in discharge. TID estimates the daily average and maximum construction water use to be 36,000 and 144,000 gallons, respectively. The maximum water use for the entire 12-month construction period would be 52.56 million gallons (161.3 AF). Tank and pipeline hydrostatic testing at the A2PP site would require 18,200 gallons and the volume required to flush all the pipelines would be 36,400 gallons. However, a relatively limited amount of water (an average of approximately 50 gallons per minute and approximately 200 gallons per minute per 1 hour for dust control and soil compaction, at peak use) would be needed daily.

The total amount of water needed for construction would equate to less than 0.5 AF per day. Due to the low production rate relative to the capable production of the local aquifer, use of the APP onsite well via the APP fire system tank would not impact other users or result in significant impacts to the groundwater basin. The use of surface water managed and distributed by TID from Lateral #2 for construction would not impact TID's ability to meet delivery requirements to other users, since average daily requirements would be about 0.11 cfs (50 gpm). The canal normally flows at 60 to 80 cfs during the irrigation season, which ideally would coincide with peak construction activity. During the rainy season, the canal flows at about 5 cfs. Drinking water would be supplied by an outside water delivery service.

Wastewater and Sanitary Waste

During the construction period, TID states that all sanitary waste would be collected in portable toilets (no discharge) supplied by a licensed contractor for collection and disposal at an appropriate receiving facility. Equipment wash water would also be collected and disposed of offsite; therefore, there would be no impacts from disposal of sanitary wastewater. Staff recommends TID handle the wastewater from hydrostatic testing similar to the handling of the equipment wash water. Handling, storing and disposal of all construction wastewater would be fully described in the construction SWPPP; required as part of Condition of Certification **SOIL&WATER-1**. Staff believes implementation of this condition would be sufficient to ensure there were no impacts due to construction wastewater.

Operational Impacts and Mitigation

Operation of A2PP could lead to potential impacts to soil, stormwater runoff, water quality, water supply, and wastewater treatment. Soils may be potentially impacted through erosion or the release of hazardous materials used in the operation of A2PP. Stormwater runoff from the A2PP site could result in potential impacts if increased runoff flow rates and volumes discharged from the site increase downstream flooding. Water quality could be impacted by discharge of eroded sediments from the A2PP site, or discharge of hazardous materials released during operation. Water supply for plant

processes, cooling, fire protection and landscape irrigation could lead to potential quantity or quality impacts to regional groundwater or surface water resources. Potential impacts to soil, stormwater, water quality, water supply, and wastewater related to the operation of A2PP, including the applicant's proposed mitigation measures and staff's proposed mitigation measures, are discussed below.

Stormwater

The development of A2PP would result in approximately 4.6 additional acres of impervious surfaces on the project site. However, the increase in the amount of impervious surface is not expected to significantly change the amount or timing of runoff from the A2PP project site as the site would be built on relatively level ground.
The existing APP stormwater drainage system would be expanded to accommodate the A2PP plant and the existing APP onsite retention pond would be relocated to the northern side of the A2PP site to incorporate stormwater drainage from both APP and A2PP. Because stormwater would be collected and discharged to the onsite retention pond, the A2PP project would not result in substantial erosion, siltation, or flooding on- or offsite; therefore, staff believes that with the implementation of Conditions of Certification **SOIL&WATER-2** and **SOIL&WATER-3**, operational impacts to drainage patterns would be less than significant. **SOIL&WATER-2** requires the project owner to identify results of stormwater BMP monitoring and maintenance activities and **SOIL&WATER-3** compels TID to comply with all requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity.

Water Supply

The Second Amendment to the Water Services Agreement (Amendment 2) (CH2MHILL2009i), modifies the Water Services Agreement (Agreement) (CH2MHILL2009f) and the First Amendment to the Water Services Agreement (Amendment 1) (CH2MHILL2009f) between TID and the City of Ceres. Amendment 2 permits the use of up to 1,135,000 gallons per day of (primary-treated) reclaimed water, via pumping through an extraction well adjacent to the Ceres WWTP percolation-evaporation (P-E) basins, as a process water supply source. The Agreement states that Ceres WWTP P-E basins will have enough capacity at all times during the year. Staff confirmed that the 12 acre P-E ponds have a percolation capacity of 3.5 inches per day, which is sufficient to meet TID's expansion pumping needs (Riddell2009). TID has stated that service from Ceres WWTP provides a high level of reliability of reclaimed water and no back-up water source is identified for A2PP. Staff confirmed that the existing reclaimed water treatment process at APP is not currently permitted and that the Central Valley RWQCB does not require the treatment process to be permitted. Staff finds that the A2PP use and delivery of reclaimed water using the existing APP facilities for delivery and treatment would also not require additional Central Valley RWQCB permits (CH2MHILL2010, Izzo2010). The basis for this finding is that the effluent from the treatment process is discharged to the permitted Ceres WWTP.

Staff reviewed the Applicant's steady-state, 3-dimensional, finite-element groundwater model (CH2MHILL2009g) and agrees with the conclusion that 95% of the process water supply pumped from the extraction well originates from the P-E basins.
The Agreement is based on mutual benefits provided to TID and the City of Ceres. TID is offered an economical source of reclaimed water for use in power plant processes

and the pumping increases the percolation rate of the WWTP P-E basins. The added demand for A2PP water helps draw down the local groundwater table in the vicinity of the Ceres WWTP to drive down mounding that inhibits percolation capacity. (Riddell2009). The Agreement allows TID to discharge process wastewater (about 50-60% of the volume extracted) directly to the P-E basins. Michael Riddell, Ceres WWTP Wastewater Systems Supervisor, stated that the terms of the Agreement allow TID to discharge process wastewater into the P-E basins only while the extraction well is in operation as there would be no benefit to Ceres WWTP when the extraction well was not increasing the percolation rate of the P-E basins (Riddell2009). This flow cycle of draw down and return flow has a net benefit that increases wastewater storage capacity in the P-E basins. Therefore, Staff is concerned that although Amendment 2 acknowledges the capacity of Ceres WWTP to provide a sufficient volume of water for the proposed A2PP, the Ceres WWTP's WDRs may be revised by the Central Valley RWQCB in the future. Should changes to water quality standards in those WDRs prohibit the inclusion of A2PP's waste discharge into the Ceres WWTP, a new process water supply source or pretreatment at the project prior to discharge to the Ceres WWTP would be needed.

The Agreement between TID and the City of Ceres requires meters to record the daily flows of reclaimed water and process water returned to the plant. Condition of Certification **SOIL&WATER-4** requires TID to provide verification of operational metering devices and complete an annual Water Use Summary to be provided in annual compliance reports.

Wastewater and Sanitary Waste

Amendment 2 (CH2MHILL2009i) allows TID to discharge up to a maximum of 560,000 gallons (1.72 AF) per day with a maximum annual total up to 52,000,000 gallons per year (160 AFY) of process wastewater from the combined existing APP facility and proposed A2PP facility directly to the Ceres WWTP P-E basins. With the addition of A2PP, the demand on the 6 inch return line is approximately 314,000 gallons per day (0.964 AF) (CH2MHILL2009f), well under the maximum daily discharge allowed in Amendment 2. The City of Ceres has agreed to accept the process wastewater from A2PP with the understanding that the Ceres WWTP could continue to meet the water quality standards of their current WDRs. Currently, no numerical limitations are in place for constituents in the Ceres WWTP's WDRs (CH2MHILL2009f). Therefore, the Almond 2 project would comply with existing WDRs.

Waste Discharge Requirements (WDRs), issued by the Central Valley RWQCB, in the San Joaquin Valley are being updated (Landau2009) and these changes will have an effect on the Ceres WWTP and ultimately could impact the Water Services Agreement with TID. Mr. Landau could not confirm the exact date that new WDRs for Ceres WWTP would be completed; however, WDR changes are anticipated within the lifespan of the A2PP project. The Central Valley RWQCB is generally concerned about salinity in the Central Valley (Wass2009; Landau2009) and staff is concerned that this may result in changes to treatment methods and water quality standards at the Ceres WWTP as it is a primary-treated system that may leach large quantities of salts into the soils and local

shallow aquifer system. Staff believes that if the Ceres WWTP is required to improve their treatment methods the City could impose restrictive water quality standards on the process wastewater from A2PP as provided for in Amendment 2 (Landau2009).

Modifications of the WDRs for Ceres WWTP or a change to the County's overall treatment operations could disrupt process wastewater service via the existing 6-inch discharge pipe to the Ceres WWTP. Staff is primarily concerned that updated WDRs would make direct discharge into the P-E basins prohibitive if the quality of the process wastewater exceeds the Ceres WWTP's ability to meet new Regional Board requirements. If pre-treatment of wastewater to comply with stricter water quality standards in the Ceres WWTP P-E basins cannot be accomplished, TID would have to find a different means of wastewater disposal. Based on the speculative nature of future WDR modifications A2PP has objected to data requests from staff that are intended to understand what treatment processes would be implemented to comply with new WDR.

Staff notes that future changes in water quality and WDR's could result in limitations on discharges on A2PP discharges and require changes in project operation. However, it is currently unknown how these changes would be implemented by the RWQCB and it is difficult to analyze any potential changes that would be required for project compliance. Any changes in response to new regulatory requirements could result in the need for a project modification or amendment. Staff has included Condition of Certification **SOIL&WATER-5** that requires the project owner to report to the CPM any violations of wastewater discharge from A2PP to the City of Ceres. The Condition also requires notification to the CPM for any suspensions, nullifications, or amendments to the Water Services Agreement (Amendment 2) (CH2MHILL2009i).

A2PP sanitary waste water will utilize the existing septic tank on APP. Staff has determined that the existing septic tank / leach field is sized appropriately to handle the additional load.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts consist of impacts that may occur as a result of the proposed project in combination with impacts from other past, present and reasonably foreseeable future projects. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

Temporary and permanent disturbances associated with construction of the proposed project would cause accelerated wind- and water-induced erosion. However, staff has concluded that the implementation of proposed mitigation measures, the SWPPP and the DESCP would ensure that the project would not contribute significantly to cumulative erosion and sedimentation impacts.

The industrial wastewater and contact stormwater from the A2PP site would be routed to the existing onsite holding tank and hauled offsite for disposal at a licensed facility. All sanitary waste water would be discharged into the existing APP septic tank / leach field. Therefore, no wastewater-related cumulative impacts are expected. The stormwater discharge would be retained on site and would not exacerbate flooding conditions in the area.

A2PP would use percolated wastewater pumped from an existing extraction well near the Ceres WWTP primary-treated percolation-evaporation basins. APP is currently the only user of this wastewater, and since A2PP would be an expansion of that power plant operation, staff does not expect the increased pumping rate to negatively affect any other water users.

No significant cumulative impacts are expected to result from the A2PP project. The A2PP project would use less than 13.2 million gallons (40.51 AF) of fresh water for construction, assuming average daily use, during the entire 12 month construction period. Though the A2PP would be a wet-cooled system, TID would be reclaiming wastewater that has percolated to groundwater near the Ceres WWTP P-E basins. The requirements for fresh water include minimal use of groundwater, for sanitary water purposes, to be pumped via the existing well at the APP site. The A2PP site would not significantly alter offsite runoff quantity or quality, nor would it significantly impact soil resources as the site was previously disturbed. Soils not covered by the plant buildings, pavement, and ancillary improvements would not be changed over the long-term. Staff believes A2PP would not contribute to a cumulative soil and water resources impact.

COMPLIANCE WITH LORS

The Energy Commission's power plant certification process requires staff to review each of the proposed project's elements for compliance with LORS and policies. Staff has reviewed the project elements and concludes that the proposed A2PP project would comply with all applicable LORS addressing protection of water resources, storm water management, and erosion control, as well as drinking water, use of freshwater, and wastewater discharge requirements, as long as staff's proposed conditions of certification are adopted and implemented. Summary discussions of project compliance with significant LORS and policies are provided below.

CLEAN WATER ACT

Staff has determined that the A2PP project would satisfy the requirements of the General National Pollutant Discharge Elimination System permit with the adoption of Conditions of Certification **SOIL&WATER-1 and SOIL&WATER-3**, which require the development and implementation of SWPPPs for construction and industrial activity.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Staff has concluded that A2PP would satisfy the applicable requirements of the Porter-Cologne Water Quality Control Act and adequately protect the beneficial uses of waters of the state through implementation of federal, state, and local requirements for management of storm water discharges and pollution prevention and compliance with local grading and erosion control requirements, and compliance with local onsite wastewater treatment system (septic system) requirements.

CALIFORNIA WATER CODE

Staff has determined that the A2PP site would comply with all sections of the California Water Code addressed in **Soil and Water Resources Table 1**. The A2PP project would utilize reclaimed water for all process and cooling water needs.

ENERGY COMMISSION WATER POLICY

California Constitution

Article X, Section 2 calls for water to be put to beneficial use, and that "waste or unreasonable use or unreasonable *method of use* be prevented." (Cal. Const., art. X, § 2; emphasis added.) The article also limits water rights to reasonable use, including reasonable methods of use. (*Ibid*.) Groundwater is subject to reasonable use. (*Katz v. Walkinshaw* (1903) 141 Cal. 116.)

Warren-Alquist Act

Section 25008 of the Commission's enabling statutes echoes the Constitutional concern, by promoting "all feasible means" of water conservation and "all feasible uses" of alternative water supply sources. (Pub. Resources Code § 25008.)

Integrated Energy Policy Report

In the 2003 Integrated Energy Policy Report ("IEPR" or "Report"), the Commission reiterated certain principles from SWRCB's Resolution 75-58, discussed below, and clarified how they would be used to discourage use of fresh water for cooling power plants under the Commission's jurisdiction. The Report states that the Commission will approve the use of fresh water for cooling purposes only where alternative water supply sources or alternative cooling technologies are shown to be "'environmentally undesirable'" or "'economically unsound.'" (IEPR (2003), p. 41.) In the Report, the Commission interpreted "environmentally undesirable" as equivalent to a "significant adverse environmental impact" under CEQA, and "economically unsound" as meaning "economically or otherwise infeasible," also under CEQA. (IEPR, p. 41.) CEQA and the Commission's siting regulations define feasible as "capable of being accomplished in a successful manner within a reasonable amount of time," taking into account economic and other factors. (Cal. Code Regs., tit. 14, § 15364; tit. 20, § 1702, subd. (f).) (IEPR, p. 39.)

State Water Resources Control Board Resolutions

In 1975, the Board determined that surface water with total dissolved solids ("TDS") of 1,000 mg/l or less should be considered fresh water. (Resolution 75-58) One express purpose of that Resolution was to "keep the consumptive use of fresh water for powerplant cooling to that *minimally essential*" for the welfare of the state. (*Ibid*; emphasis added.) In 1988, the board designated all groundwater and surface waters of the States as potential sources of drinking water, worthy of protection for current or future beneficial uses, except where: (a) the total dissolved solids are greater than 3,000 milligrams per liter, (b) the well yield is less than 200 gallons per day (gpd) from a single well, (c) the water is a geothermal resource, or in a water conveyance facility, or (d) the water cannot reasonably be treated for domestic use using either best management practices or best economically achievable treatment practices. (Resolution 88-63.) State Water Resources Control Board Resolution 2009-0011 encourages and promotes reclaimed water use for non-potable purposes.

The A2PP project uses three combustion turbines operating in simple cycle mode without a steam cycle. During operation, the applicant estimates approximate 293 acre feet of water will be required each year. Reclaimed water is available from the City of Ceres.

Because the project would pump groundwater solely for sanitary uses onsite, and because the project is using reclaimed water for project processes, including cooling, staff finds that the Almond 2 project complies with state and Energy Commission water policies.

NOTEWORTHY PUBLIC BENEFITS

Neither the applicant nor staff has identified any noteworthy benefits to soil or water resources that would be provided by the project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments on Soil and Water Resources were received.

CONCLUSIONS

Based on its assessment of the proposed TID Almond 2 Power Plant (A2PP) project, staff concludes the following:

- Implementation of Best Management Practices (BMPs) during A2PP construction and operation in accordance with effective SWPPPs and a DESCP would avoid significant adverse effects that could be caused by transport of sediments or contaminants from the A2PP site and associated linear facilities by wind or water erosion.
- The proposed reclaimed water supply for the project would not cause a significant adverse environmental impact on current or future users of the water supply.
- The Waste Discharge Requirements for the City of Ceres Wastewater Treatment Plant may be altered by the Central Valley Regional Water Quality Control Board in the future, which could affect the both the water supply and wastewater disposal for the A2PP site.
- The proposed project would be constructed to comply with 100-year flood requirements and would not exacerbate flood conditions in the vicinity of the project.
- The proposed project would comply with all applicable federal, state and local laws, ordinances, regulations and standards with the adoption of the recommended conditions of certification.
- A2PP would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources with adoption of the conditions of certification.
- The project complies with the state water policies by using reclaimed water.

Staff concludes that A2PP would not result in any unmitigated project-specific or cumulative significant adverse impacts to soil or water resources and would comply with all applicable laws, ordinances, regulations and standards (LORS) if all of the recommended conditions of certification are adopted by the Commission and implemented by TID.

PROPOSED CONDITIONS OF CERTIFICATION

SOIL&WATER-1: The project owner shall comply with the requirements of the General National Pollutant Discharge Elimination System (NPDES) permit for discharges of storm water associated with construction activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the entire TID Almond 2 Power Plant (A2PP).

Verification: At least 60 days before construction begins, the project owner shall submit a copy of the construction SWPPP to the Stanislaus County Stormwater Management Engineer for review. At least 30 days before construction begins, the project owner shall submit copies to the Compliance Project Manager (CPM) of all correspondence between the project owner and the Central Valley Regional Water Quality Control Board (RWQCB) regarding the General NPDES permit for the discharge of storm water associated with construction activities. This information shall include copies of the Notice of Intent and the Notice of Termination sent to the State Water Resources Control Board for the project construction.

SOIL&WATER-2: The project owner shall develop a site-specific DESCP that ensures protection of water quality and soil resources of the project site and all linear facilities for both the construction and operation phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in offsite flooding potential, meet local requirements, and identify all monitoring and maintenance activities. Monitoring activities shall include routine measurement of the volume of accumulated sediment in the stormwater retention basin. Maintenance activities must include removal of accumulated sediment from the retention basin when an average depth of 0.5 feet of sediment has accumulated in the retention basin. The plan shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1**. The DESCP shall contain the following elements. All maps shall be presented at a legible scale no less than 1” = 100’.

- ***Vicinity Map*** – A map shall be provided indicating the location of all project elements with depictions of all significant geographic features to include watercourses, washes, irrigation and drainage canals, and sensitive areas.
- ***Site Delineation*** – The site and all project elements shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.
- ***Watercourses and Critical Areas*** – The DESCP shall show the location of all nearby watercourses including washes, irrigation and drainage

canals, and drainage ditches, and shall indicate the proximity of those features to the construction site.

- ***Drainage*** – The DESCP shall include hydrologic calculations for onsite areas and offsite areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and show all existing, interim, and proposed drainage infrastructure and their intended direction of flow. Provide hydraulic calculations to support the selection and sizing of the drainage network, retention facilities and best management practices (BMPs). Spot elevations shall be required where relatively flat conditions exist. The spot elevations and contours shall be extended off site for a minimum distance of 100 feet in flat terrain or to the limits of the offsite drainage basins that drain toward the site.
- ***Clearing and Grading*** – The plan shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.
- ***Project Schedule*** – The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.
- ***Best Management Practices*** – The DESCP shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.
- ***Erosion Control Drawings*** – The erosion control drawings and narrative shall be designed, stamped and sealed by a professional certified engineer or erosion-control specialist.

Verification: No later than 90 days prior to start of construction, the project owner shall submit a copy of the DESCP to Stanislaus County for review and comment. No later than 60 days before the start of construction, the project owner shall submit a copy

of the DESCP to the CPM for review and approval. The project owner shall promptly submit a copy of any comments from Stanislaus County regarding the DESCP to the CPM. During construction, the project owner shall provide an analysis in the monthly compliance report on the effectiveness of the drainage-, erosion- and sediment-control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall provide in the annual compliance report information on the results of stormwater BMP monitoring and maintenance activities.

SOIL&WATER-3: The project owner shall comply with the requirements of the General NPDES permit for discharges of storm water associated with industrial activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of the site. The project owner shall ensure that only stormwater is discharged onto the site. The project owner shall comply with the requirements of the general NPDES permit for discharges of storm water associated with industrial activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of the site.

Verification: At least 30 days prior to commercial operation, the project owner shall submit the operational Storm Water Pollution Prevention Plan for the A2PP site to the CPM. Within 10 days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the project owner and the RWQCB about the general NPDES permit for discharge of storm water associated with industrial activity. This information shall include a copy of the notice of intent sent by the project owner to the State Water Resources Control Board. A letter from the RWQCB indicating that there is no requirement for a general NPDES permit for discharges of storm water associated with industrial activity would satisfy this condition.

SOIL&WATER-4: Water used for project operation processing shall exclusively be reclaimed water from the City of Ceres Wastewater Treatment Plant. Pumping or purchasing groundwater for this supply source is prohibited. Water use shall not exceed 514 acre-feet per year. The project owner shall monitor and record the total water used on a monthly basis. For calculating the annual water use, the term “year” will correspond to the date established for the annual compliance report submittal.

The project owner shall maintain metering devices as part of the water supply and distribution systems to monitor and record, in gallons per day, the total volume(s) of water supplied to A2PP from the City of Ceres. Those metering devices shall be operational for the life of the project.

For the first year of operation, the project owner shall prepare an annual Water Use Summary, which will include the monthly average of daily water usage in gallons per day, and total water used by the project on a monthly and annual basis in acre-feet. For subsequent years, the annual Water Use Summary shall also include the annual water used by the project in prior years. The annual Water Use Summary shall be submitted to the CPM as part of the annual compliance report (ACR).

Verification: At least 60 days prior to commercial operation of A2PP, the project owner shall submit to the CPM evidence that metering devices are operational on the water supply and distribution systems. The project owner, in the annual compliance report, shall provide a Water Use Summary that states the source and quantity of water used on a monthly basis and on an annual basis in units of acre-feet. The ACR shall also report the average daily water usage in gallons per day for each month. Prior annual water use shall be reported in subsequent annual compliance reports.

SOIL&WATER-5: The A2PP process wastewater will discharge to the Ceres WWTP Percolation-Evaporation basins at a maximum discharge of 560,000 gallons per day per the City of Ceres, CA and Turlock Irrigation District Water Services Agreement and its Amendments. In the event the Water Services Agreement is suspended, nullified, or amended, the project owner shall provide the CPM with all information and documentation related to A2PP water supply or waste discharge to the City of Ceres Waste Water Treatment Plant (WWTP). During operation, any monitoring reports provided to the City of Ceres shall also be provided to the CPM. The CPM shall be notified of any violations of discharge limits or amounts.

Verification: During A2PP operation, the project owner shall submit to the CPM any wastewater quality monitoring reports required by the City of Ceres, in the annual compliance report. The project owner shall submit any notice of violations from the City of Ceres to the CPM within 10 days of receipt and fully explain the corrective actions taken in the annual compliance report. The project owner shall also promptly provide to the CPM copies of all correspondence between the Ceres WWTP and TID related to suspensions, nullifications, or amendments to the Water Services Agreement.

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TRAFFIC AND TRANSPORTATION

Testimony of Marie McLean

SUMMARY OF CONCLUSIONS

The Almond 2 Power Plant (A2PP) would be consistent with the Circulation Element in the Stanislaus County General Plan and the City of Ceres General Plan. In addition, with implementation of the three proposed conditions of certification, the A2PP would be consistent with all other applicable laws, ordinances, regulations, and standards.

During the construction and operation phases, local roadway and highway demand resulting from the daily movement of workers and materials would not increase beyond significance thresholds established by the City of Ceres and Stanislaus County. During the operational phase, the project would not adversely affect local roads or aviation operations associated with any airport flight traffic.

INTRODUCTION

In the traffic and transportation analysis, staff addresses the extent to which the project may affect the transportation system in the local area. In this analysis, staff identifies:

1. Proposed roads and routings to be used for construction and operation
2. Potential traffic-related problems associated with the use of those routes by construction workers and truck deliveries
3. Anticipated encroachment on public rights-of-way during the construction of the proposed project and associated facilities
4. Frequency of trips and probable routes associated with the delivery of hazardous materials
5. Possible effects of project operations on local airport flight traffic.

In addition to assessing potential project-related impacts, staff has reviewed the applicable laws, ordinances, regulations, and standards (LORS) to determine compliance. The LORS that govern the project are listed in **Traffic and Transportation Table 1**, followed by information about the potential impacts related to traffic operations and safety hazards resulting from the construction and operation of the A2PP.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Traffic and Transportation Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal	
Code of Federal Regulations (CFR), Title 14, Transportation; Chapter 1, Part 77	Includes standards for determining obstructions in navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alteration. Also, provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace.
Code of Federal Regulations (CFR), Title 14, Transportation; Subtitle B, Other Regulations Relating to Transportation	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures) and provides safety measures for motor carriers and motor vehicles that operate on public highways.
State	
California Vehicle Code, Division 2, Chapter. 2.5; Div. 6, Chap. 7; Div. 13, Chap. 5; Div. 14.1, Chap. 1 & 2; Div. 14.8; Div. 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
California Streets and Highway Code, Division 1 & 2, Chapter 3 & Chapter 5.5	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits.
Local	
City of Ceres General Plan; Transportation and Circulation Element, February 24, 1997	Requires level of service (LOS) D for major roadways (arterials, expressways, and roadways) and LOS C for secondary collector or local roadways or better operating conditions for all roadway links and intersections.
Stanislaus County of Governments Regional Transportation Plan, 2007	Establishes regional transportation goals, policies, objectives and actions for various modes of transportation, such as improvements to mobility, improvement of goods movement, and so forth.
County of Stanislaus 1997 General Plan; Circulation Element	County will maintain at least a level of service (LOS) C or better operating conditions for all county roadways and intersections, except in a sphere of influence of a city when the city has adopted a lower level of service.

SETTING

The A2PP is located on Crows Landing Road, approximately three miles south of State Route (SR) 99, in Ceres, California, County of Stanislaus, on an approximately 4.6-acre parcel, next to the existing 48-MW Almond Power Plant (A1PP). Both the A2PP and the existing A1PP are owned and operated by the Turlock Irrigation District (TID). The TID is the first publicly-owned irrigation district in California and one of only four districts that sells electric energy to its customers. Construction is scheduled to begin in third quarter 2010 and be completed in third quarter 2011.

Access to the site from the north is from SR 99 through Crows Landing Road. From the south, access is via Keyes Road, which intersects with Crows Landing Road approximately two miles west of SR 99.

See **Traffic and Transportation Figure 1, Regional Transportation System,** for a map of the region surrounding the project site. This figure includes locations of airports; bus and train stations; railroads; freeways; highways, and major roads located near the project site. This figure may be found at the end of this analysis.

CRITICAL HIGHWAYS AND ROADS

This section includes information about state highways and local roads located near to the project site. These roads are used to access the project during construction and operation.

State Route (SR) 99 is a major north-south highway in California's Central Valley. Its northern terminus is CA-36 in Red Bluff; the southern terminus is Interstate 5 south of Bakersfield. State Route 99 extends through Ceres approximately two miles southwest of the project site. Access to the project site is from SR 99 through Crows Landing Road. From the south, access is through Keyes Road, which intersects with Crows Landing Road approximately two miles west of SR 99.

According to traffic counts published by the California Department of Transportation (Caltrans) in 2007, the average daily traffic volume on SR 99 was 118,000 vehicles per day north of Crows Landing Road and 108,000 vehicles per day south of Mitchell Road.

State Route (SR) 132, a two-lane to four-lane highway, begins at exit 72A, Interstate 580, just west of town of Vernalis and runs due east into Modesto. State Route 13 ends at the intersection of SR 49 in Coulterville. State Route 132 connects to SR 99 approximately five miles north of the project site.

According to Caltrans' 2007 traffic counts, the average daily traffic volume on SR 132 was 24,400 vehicles per day east of El Vista Avenue; 26,600 vehicles per day west of El Vista Avenue; and 14,400 vehicles west of Carpenter Road.

Crows Landing Road, a two-lane to four-lane roadway running north to south, is located between I-5 and SR 99. Local access to the project site for southbound SR 99 traffic is via Crows Landing Road. The project site is located approximately three miles west of SR 99 via Crows Landing Road.

According to the Stanislaus County Department of Public Works, Traffic Section, the average daily traffic counts for Crows Landing Road on roads closest to the plant are as follows. Year of count is in parenthesis.

1. South of Service Road, 8,432 (2007)
2. North of Whitmore Road, 0,967 (2005)
3. North of West Main, 5,522 (2008)

Service Road, a 13-mile-long, east-west roadway, begins west of Carpenter Road and ends east of Geer Road. Running through the city of Ceres, the road is used to access the project by northbound traffic traveling on SR 99.

According to the Stanislaus County Department of Public Works, Traffic Section, the average daily traffic counts for Service Road on roads closest to the plant are as follows. Year of count is in parenthesis.

1. East of Crows Landing Road, 5,417 (2004)
2. West of Crows Landing Road, 1.434 (2008)

Whitmore Avenue, a two-lane, east-west undivided roadway through downtown Ceres and unincorporated sections of Stanislaus County, begins west of Carpenter Road and ends at Montpellier Road. The road is used to access the project site via Central Avenue. Center Avenue intersects with Service Road, which is located south of Center Avenue.

According to the Stanislaus County Department of Public Works, Traffic Section, the average daily traffic counts for Whitmore Avenue on roads closest to the plant are as follows. Year of count is in parenthesis.

1. East of Crows Landing Road, 13,114 (2006)
2. West of Crows Landing Road, 0,142 (2005)

Hatch Road, a two-to-four-lane, east-west roadway, runs through downtown Ceres and unincorporated parts of Stanislaus County. Hatch Road begins west of Carpenter Road and ends at Greer Road. Located north of the project site, Hatch Road consists of two lanes from Crows Landing Road to SR 99 and four lanes from SR 99 to Mitchell Road.

According to the Stanislaus County Department of Public Works, Traffic Section, the average daily traffic counts for Hatch Road on roads closest to the plant are as follows. Year of count is in parenthesis.

1. West of Santa Fe Avenue, 546 (2009)
2. East of Crows Landing Road, 3,114 (2009)
3. West of Crows Landing Road, 10,142 (2005)

Mitchell Road, a two-lane to four-lane, north-south parkway running north-south through Stanislaus County, is located between SR 108 and SR 99. A four-lane highway near the project site, Mitchell Road provides access to the project site for traffic coming south from Modesto.

According to the Stanislaus County Department of Public Works, Traffic Section, the average daily traffic counts for Service Road on roads closest to the plant are as follows. Year of count is in parenthesis.

1. South of Service Road, North of Highway 99, 23,972 (2005)
2. North of Finch Road, 24,633 (2003)

LEVEL OF SERVICE

Level of Service (LOS) is a qualitative measure used to describe operational conditions within a traffic stream. The term is used to quantify a level of congestion on a particular roadway or intersection through the use of such factors as *speed*, *travel time*, and *delay*.

The *Highway Capacity Manual* includes descriptions of six levels of service for roadways or intersections. Those six levels of service range from LOS A, used to describe the best operating conditions, to LOS F, used to describe the worst.[1]

Traffic and Transportation Table 2 includes statistics about existing daily traffic volumes and levels of service (LOS) in and around the project area. Plant construction and operation traffic would use the existing local roadways, which include Mitchell Road, East Hatch Road, Crows Landing Road, and East Whitmore Avenue. According to the Stanislaus County Department of Public Works, Traffic Section, those roads have a LOS of C or better.

The principal highways in the area are SR 99; SR 132; and I-205. Level of Service (LOS) for those roads is as follows:

1. SR 99, North of Crows Landing Road, LOS C
2. SR 99, South of Mitchell Road, LOS C
3. SR 20, West of SR 99, LOS B
4. SR 132, East of El Vista Avenue, LOS A
5. SR 132, West of El Vista Avenue, LOS A
6. SR 132, West of Carpenter Road, LOS A
7. I-205, West of I-5, LOS F
8. I-5, North of I-205, LOS B
9. I-580, North of SR 132, LOS A[2]

[1] National Research Council, *Highway Capacity Manual, Third Edition*, 1994.

[2] The level-of-service (LOS) system uses the letters *A* through *F*, with *A* being the best and *F* being the worst to measure the efficiency with which traffic flows on highways. On a road with traffic classified as LOS A, traffic flows at or above the posted speed limit and all motorists have complete mobility between lanes. LOS B is slightly more congested and maneuverability is somewhat reduced; LOS C has more congestion than B; at LOS C roads remain safely below but close to capacity; and posted speed is maintained. LOS C is often the target designation for urban highways; LOS D is often the level of service of a busy shopping corridor in the middle of the weekday or a functional urban highway during commuting hours; with LOS E, traffic flow is irregular and speed varies rapidly, but rarely reaches the posted limit. LOS F is the lowest measurement. Traffic flow is forced; and every vehicle moves in lockstep with the vehicle in front. Stops are frequent, with a drop in speed to nearly zero mph. See the *Highway Capacity Manual* for additional information.

Traffic and Transportation Table 2
Roadway Segment Level of Service (LOS) Existing Conditions

Roadway Segment	Traffic Flow	Divided/ Undivided	Number of Lanes	Year ADT Count	Original AM Peak Hour Volume	AM Peak LOS	Original PM Peak Hour Volume	PM Peak LOS	Acceptable LOS
Crows Landing Road	North of Hatch Road	Undivided	4	2008	1,986	C	2,795	D	D
Crows Landing Road	North of Whitmore Avenue	Undivided	4	2008	1.472	C	1,828	C	D
Crows Landing Road	South of Whitmore Avenue	Undivided	4	2008	1,213	C	1,386	C	D
Whitmore Avenue	East of Crows Landing Road	Undivided	2	2008	656	C	1,041	C	D
Service Road	East of Central Avenue	Undivided	2	2008	460	C	775	C	D

Source: Almond 2 Power Plant (09-AFC-2) E-Mail Queries Set 1
[1]No adjustment needed for 2008 peak volumes or trucks PCE
[2]No adjustment needed for 2008 peak volumes or trucks PCE

Delays and LOS for the intersections in the vicinity of the project site are presented in Traffic and Transportation Table 3. Delays for the entire intersection are available for signalized intersections; if the intersection is stop-controlled, the delay for the controlled approach is available. All intersections operate at an acceptable level of service.

Traffic and Transportation Table 3
Freeway Segment Level of Service (LOS) Existing Conditions

Roadway Segment	Traffic Flow	Undivided/ Divided	Number of Lanes	Year ADT Count	Original and Adjusted Average Daily Traffic[1]	Daily LOS	Acceptable LOS
State Route 99	North of Crows Landing Road	Undivided	6	2007	118,000	C	D
State Route 99	South of Mitchell Road	Undivided	6	2007	108,000	C	D
State Route 132	East of El Vista Avenue	Undivided	4	2007	24,400	A	D
State Route 132	West of El Vista Avenue	Undivided	4	2007	26,600	A	D
State Route 132	West of Carpenter Road	Undivided	2	2007	14,400	A	D
Interstate 205	West of Interstate 5	Divided	4	2007	101,000	F	D
Interstate 5	North of Interstate 205	Divided	10	2007	160,000	B	D
State Route 120	West of State Route 99	Divided	4	2007	70,000	B	D
Interstate 580	North of State Route 132	Divided	4	2007	37,000	A	D

Source: Almond 2 Power Plant (09-AFC-2) E-Mail Queries Set 1
[1]No adjustment needed for 2008 peak volumes or trucks PCE

Traffic and Transportation Table 4
Existing Intersection Level of Service (LOS) Summary

Intersection	Traffic Control	AM Peak-Hour Delay*	LOS	PM Peak- Hour Delay*	LOS
Crows Landing Road/Service Road	Signal	28	C	27	C
Crows Landing Road/Hackett Road	Signal	25	C	26	C
Crows Landing Road/Whitmore Avenue	Signal	30	C	43	D
Crows Landing Road/Hatch Road	Signal	28	C	33	C
Crows Landing Road/Northbound SR 99 Ramps	Two-Way Stop Control	28 (East-bound)	D	43 (East-bound)	E
Carpenter Road/Service Road	All-Way Stop Control	9	A	9	A
Service Road/Morgan Road	All-Way Stop Control	10	A	11	B
Service Road/Blaker Road	All-Way Stop Control	10	B	16	C
Service Road/Central Avenue	Signal	25	C	25	C
Mitchell Road/Service Road	Signal	26	C	32	C
Carpenter Road/Whitmore Avenue	All-Way Stop Control	10	B	15	C
Whitmore Avenue/Morgan Road	Signal	24	C	29	C
Whitmore Avenue/Blaker Road	Signal	19	B	27	C
Whitmore Avenue/Ustick Road	Signal	11 (North-bound)	B	13 (North-bound)	B

Source: AFC Table 5.12-2, *TIDAlmond II Power Plant*, 2009
*Delay is measured in second/vehicle for the intersection

AIRPORTS

Stanislaus County is home to five airports, four of which are located more than 20,000 feet from the A2PP site. The airport closest to the site, Modesto City-County Airport, is located approximately 20,000 feet northeast of the site. An average of 235 aircraft operations per day occurred at the Modesto City-County Airport in 2007.

Staff has reviewed the requirements for filing with the Federal Aviation Administration (FAA) FAA Form 7460-1, Notice of Proposed Construction, and concludes that the filing of FAA Form 7460-1 is not necessary for the following reasons:

1. The three 80-foot stacks at an elevation of 81.6 feet do not exceed the FAA's 200-foot requirement
2. The slope ratio as calculated by the FAA Notice of Criteria Tool indicates the Notice Criteria has not been exceeded.

3. A2PP does not require construction of a highway, railroad, waterway, and so forth, and neither will it be in an instrument approach area that might exceed FAA requirements or be located on an airport or heliport.

A private airstrip for crop dusters is located on Redwood Road, between Washington Road and Faith Home Road. That airstrip is also located more than 20,000 feet from the project site.

PUBLIC TRANSPORTATION

Public transportation in the area consists of fixed-route and share-a-ride bus service provided by Ceres Area Transit; Ceres Dial-A-Ride and Stanislaus Regional Transit and school bus service provided by the Ceres Unified School District. Information about those services follows. See also **Traffic and Transportation Figure 2**.

Public Transportation

The following types of public transportation are available in the area of A2PP:

1. Ceres Area Transit (CAT) provides fixed-route bus services in Ceres and Modesto.
2. Ceres Dial-A-Ride provides shared public transportation in Ceres and nearby unincorporated areas of Stanislaus County.
3. Stanislaus Regional Transit (StaRT) provides intercity fixed route and dial-a-ride services within Stanislaus County. Ceres Dial-A-Ride provides shared public transportation in Ceres and nearby unincorporated areas of Stanislaus County.

School Bus Service

According to Ceres Unified School District, at least two school bus stops are located on Crows Landing Road. The school bus stops occur at approximately the following times:

1. Morning: 6:30 am – 8:45 am
2. Midday: 11:00 am – 1 pm
3. Afternoon: 3:00 pm – 4:30 pm
4. Evening: 5:00 pm – 6:15 pm

Crows Landing Road will be used by the workforce going to and from the project site as well as by trucks hauling equipment and materials to be used during construction of the project.

RAILROADS

The Union Pacific Railroad (UPRR) tracks are located on the eastern boundary of the project site. According to the applicant, the railroad tracks adjacent to the project site are currently used to transport, among other things, food items to and from the industrial park located in the city of Turlock. In addition, rail deliveries also include feedstock for the Foster Farms Plant, which is also located in Turlock. (CH2MHill, Data Request 71, September 14, 2009; Docket 09-AFC-2). Passenger service is not provided. See **Traffic and Transportation Figure 2** for location of the tracks.

The tracks are not designed to transport heavy loads and will not be used to deliver equipment to the project site. In addition, passenger service is not provided.

BICYCLE ROUTES

The city of Ceres has located three classes of bikeways in the city, including Class 1 bikeways or bike paths; Class II bikeways or bike lanes; and Class III bikeways or signed routes.

The following bike routes are located near the A2PP:

1. Class I bikeway located south of Service Road and Grayson Road
2. Class II and Class III bikeways located along Whitmore Avenue, Service Road, Crows Landing Road, Morgan Road, Blaker Road, and Central Avenue.

A Class III bikeway, considered a rural bike lane, is generally designated by a white line along the edge of a roadway. Energy Commission staff observed no bicycle or pedestrian activity in the area of the project site. See **Traffic and Transportation Figure 2** for locations of the bicycle routes.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

According to Appendix G of the California Environmental Quality Act (CEQA), Guidelines, Appendix G, a project may have a significant effect on traffic and transportation if the project would:

- Conflict with adopted policies, plans, or programs
- Cause a substantial increase in traffic when compared with the existing traffic load and capacity of the street system (for example, 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 (LOS) standard established by the county congestion management agency for designated roads or highways
- Substantially increase hazards due to a design feature (for example, sharp curves or dangerous intersections) or incompatible uses (farm equipment, for example)
- Result in inadequate parking capacity or a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks or in inadequate emergency access

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

When evaluating a project's potential impact on the local transportation system, staff uses level of service (LOS) determinations as the foundation on which to base its

analysis. In this section staff (1) identifies potential traffic impacts associated with the construction of the A2PP; (2) assesses the impacts; and (3) recommends mitigation of impacts when necessary.

The Application for Certification (AFC) includes an analysis of projected traffic conditions with the addition of project construction traffic trips. Project construction is expected to take 12 months. A 1.85-acre parcel adjacent to the northern border of the project site within the WinCo property will be used for parking as well as laydown of construction materials (A2PP, 2009a, p. 5.13-15). See **Traffic and Transportation Figure 2**. Staff has determined that the on-site parking areas are adequate for the number of construction workers involved in the project.

Construction Workforce Traffic

According to the applicant, construction will occur eight hours a day between 7:00 am and 3:30 pm. As a result, inbound worker trips will occur before the morning peak hour for existing traffic. Outbound worker trips will occur before the evening peak hour.

Traffic will consist of both delivery/haul trucks and workers, some of whom will carpool. The majority of traffic will result from workers traveling to the site. The applicant assumes that 20% of the workforce will carpool and the average occupancy per vehicle would be two persons. Trips by inbound workers will occur before morning peak-hour traffic and outbound workers will be leaving the site before the evening peak-hour traffic.

However, to determine impacts, the applicant chose the worst-possible scenario: Construction trips were assumed during morning and evening peak periods. Truck trips were assumed to be distributed evenly throughout the day. Truck trips were converted to passenger-car equivalent units (PCEs) at a ratio of 1.5 passenger cars for each truck. In addition, the applicant assumed that 20% of the workforce will carpool and the average vehicle occupancy would be two persons per vehicle.

Based on the assumptions in the previous paragraphs, the applicant estimates that the A2PP project will generate 394 daily passenger car equivalent trips, with 156 trips occurring during the morning and evening peak hours. Given experience with previous projects and the fact that the applicant based his analysis on the worst-possible scenario, staff believes that the estimated construction traffic trips and assumptions about peak construction activity are more than reasonable.

Most of the construction traffic—at least 70%—will originate from the Stanislaus County cities of Modesto and Ceres; 20% will originate San Joaquin County; and 10% from Merced and Stanislaus counties. Traffic will use state routes, interstate highways, and local roads.

Total Construction Traffic

Based on the worst-case scenario, the applicant estimates that the A2PP project will generate 394 daily passenger car equivalent trips, with 156 trips occurring during the morning and evening peak hours (268 worker trips plus 126 PCE for truck and delivery trips.)

Information about existing and construction-related traffic conditions on local roadway segments, including level of service (LOS), may be found in the following four tables **Traffic and Transportation Table 5,** Existing and Construction-Related Local Traffic Conditions, Including LOS, AM Peak Hour; **Traffic and Transportation Table 6,** Existing and Construction-Related Local Traffic Conditions, Including LOS, PM Peak Hour; **Traffic and Transportation Table 7**, Existing and Construction-Related Freeway Traffic Conditions, Including LOS, by Project Trips Added; and **Traffic and Transportation Table 8**, Construction Delays at Intersections, Including LOS, by Peak Hours.

Traffic and Transportation Table 5 and **Traffic and Transportation Table 6** follow. As indicated in **Table 5,** all local roadway segments operate at LOS C during AM peak hour traffic. However, as indicated in **Table 6**, during PM peak hour traffic, Crows Landing Road, North of Hatch Road, operates at LOS D. All other roads operate at LOS C.

Traffic and Transportation Table 5
Existing and Construction-Related Local Traffic Conditions, Including LOS, AM Peak Hour

Roadway Segment		Location	Volume	Trips Added	Daily V/C	LOS
Local Roadway Segments	Crows Landing Road	North of Hatch Road	1,986	71	0.66	C
	Crows Landing Road	North of Whitmore Avenue	1,472	102	0.51	C
	Crows Landing Road	South of Whitmore Avenue	1,213	133	0.43	C
	Whitmore Avenue	East of Crows Landing Road	656	32	0.44	C
	Service Road	East of Central Avenue	460	16	0.31	C

Source: *TID Almond 2 Power Plant AFC*, May 2009; page 5.12-19.

Traffic and Transportation Table 6
Existing and Construction-Related Local Traffic Conditions, Including LOS, PM Peak Hour

Roadway Segment		Location	Volume	Trips Added	Daily V/C	LOS
Local Roadway Segments	Crows Landing Road	North of Hatch Road	2,795	71	0.92	D
	Crows Landing Road	North of Whitmore Avenue	1,828	102	0.62	C
	Crows Landing Road	South of Whitmore Avenue	1,386	133	0.49	C
	Whitmore Avenue	East of Crows Landing Road	1,041	32	0.69	C
	Service Road	East of Central Avenue	775	16	0.51	C

Source: *TID Almond 2 Power Plant AFC*, May 2009; page 5.12-19.

Traffic and Transportation Table 7 and **Traffic and Transportation Table 8** follow**.** Table 7, Existing and Construction-Related Freeway Traffic Conditions, Including LOS, by Project Trips Added, includes information about existing and construction-related traffic conditions on state highway segments, including level of service (LOS), according to project trips added.

Traffic and Transportation Table 7
Existing and Construction-Related Freeway Traffic Conditions, Including LOS, by Project Trips Added

Roadway Segment		Location	Average Daily Traffic	Project Trips Added Daily	Percent of ADT	Daily V/C	LOS
Freeway Traffic	State Route 99	North of Crows Landing Road	118,000	178	<1	0.96	E
	State Route 99	South of Mitchell Avenue	108,000	40	<1	0.76	C
	State Route 120	West of SR 99	70,000	20	<1	0.63	B
	State Route 132	East of El Vista Avenue	24,000	20	<1	0.69	B
	State Route 132	West of El Vista Avenue	16,600	20	<1	0.74	C
	State Route 132	West of Carpenter Road	14,400	20	<1	0.75	C
	I-205	West of I-5	101,000	20	<1	0.86	D
	I-5	North of I-205	160,000	20	<1	0.59	A
	I-580	North of SR 132	37,00	20	<1	0.46	A

Source: *TID Almond 2 Power Plant AFC*, May 2009; page 5.12-19.

Traffic and Transportation Table 8, Construction Delays at Intersections, Including LOS, by Peak Hours, includes information about delays at various intersections in the project area according to morning and evening peak hour traffic. As indicated in Table 8, twelve study intersections are forecast to operate at LOS C or better during construction conditions. One intersection is forecast to operate at LOS D; one at LOS E, and one at LOS A.

Traffic and Transportation Table 8
Construction Delays at Intersections, Including LOS, by Peak Hour

Intersection	AM Peak Hour Delay (Seconds)	LOS	PM Peak Hour Delay (Seconds)	LOS
Crows Landing Road/Service Road	27	C	26	C
Crows Landing Road/Hackett Road	23	C	27	C
Crows Landing Road/Whitmore Road	29	C	45	D
Crows Landing Road/Hatch Road	28	C	34	C
Crows Landing Road/Northbound SR 99 Ramps	28 (EB)	D	46 (EB)	E
Carpenter Road/Service Road	9	A	9	A
Service Road/Morgan Road	10	A	11	B
Service Road/Blaker Road	10	B	16	C
Service Road/Central Avenue	25	C	25	C
Mitchell Road/Service Road	28	C	33	C
Carpenter Road/Whitmore Avenue	10	B	16	B
Whitmore Avenue/Morgan Road	24	C	29	C
Whitmore Avenue/Blaker Road	19	B	28	C
Whitmore Avenue/Ustick Road	11 (NB)	B	13 (NB)	B

Source: *TID Almond 2 Power Plant AFC*, May 2009; page 5.12-18.

Staff has recommended a traffic and transportation control plan that will be prepared in coordination with the city of Ceres, Stanislaus County, and Caltrans (see Condition of Certification **TRANS-2**). This transportation plan will require methods to reduce the project's impact at locations projected to have a negative change in LOS due to construction traffic.

Staff is also proposing Condition of Certification **TRANS-3** to repair any damage to Mitchell Road, East Hatch Road, and Crows Landing Road from construction traffic, particularly from heavy trucks.

Linear Facilities

In the AFC submitted by the applicant in May 2009, two natural gas pipeline alignments were proposed by PG&E and included in the AFC. In November 2009, PG&E settled on a preferred alignment. This preferred alignment is analyzed in this section.

According to PG&E, natural gas would be provided through an 11.6-mile natural gas pipeline that begins at a new PG&E metering set to be located along the south fence line of the existing A1PP. See **Traffic and Transportation Figure 2**, Local Transportation Network.

After exiting the A2PP site, it would continue east for approximately 0.6 mile paralleling Turlock Irrigation District; turn south and continue along Morgan Road for approximately three miles; turn west on East Zeering Road for approximately one-half mile; turn south on Bystrum Road and continue on unpaved farm access roads for approximately 4.5 miles; then turn west on W. Harding Road for approximately 1.5 miles.

The pipeline then would turn south on an unnamed farm road for 0.3 mile, then west through a farm field for 0.5 mile, and finally south on an unnamed farm road for approximately 0.7 mile, before joining with PG&E's line at W. Bradbury Road.

According to the applicant, construction of the natural gas pipeline would employ 20 workers, who would meet at the corporate yards of both the Turlock Irrigation District and PG&E; travel together in trucks; and park adjacent to the corridors.

In addition, two 115-kV transmission line corridors and the reconductoring of a 69-kV subtransmission line will be constructed. The two 115-kV line corridors will be constructed to connect with the proposed Grayson Substation located about 3,300 feet southwest of A2PP, east of the intersection of Grayson Road and Crows Landing Road.

The construction of the natural gas pipeline and transmission lines may impact the local area traffic. It is more than likely that the gas pipeline would be open cut trenched and will be within the county right-of-way. The need for flagmen and proper signage would be needed both for the installation of the gas pipeline and transmission lines. Consequently, to reduce impacts on area traffic as well as to facilitate safety during construction, staff has recommended Condition of Certification **TRANS-2** to ensure traffic control measures are in place.

Construction Phase Transport of Hazardous Materials and Waste

Deliveries to the A2PP project site would include small quantities of hazardous materials to be used during the project's construction. Hazardous materials will be transported over prearranged routes, State Route 99 and Interstate 5. Deliveries will be made to the plant via Crows Landing Road and the Almond Power Plant access road.

The applicant has indicated that the delivery and disposal of hazardous materials to and from the site as well as handling of the materials on site would be done according to all applicable state and federal standards. See Hazardous Materials Management in this staff assessment for additional information.

OPERATION IMPACTS AND MITIGATION

Hazards and Public Safety

Employee and Truck Traffic

The site on which the A2PP power plant is to be located on the existing site of the A1PP, which employs twelve workers. The operation of A2PP will result in four additional workers traveling to the site.

Those four workers will generate eight additional trips to and from the project site. Staff assumes those four workers will use the same routes as workers at the A1PP. Other project-related trips—delivery trucks, visitors, and other business-related trips—are expected to be minimal and occur during business hours.

Consequently, staff determined that these minor traffic additions to local streets and highways would not significantly affect the LORS of these roads.

School Bus Routes

As discussed earlier in the analysis, Crows Landing Road will be used by the workforce going to and from the project site as well as by trucks hauling equipment and materials to be used during construction of the project. Several school bus stops exist on Crows Landing Road, including one directly across the street from the construction site. As part of the response to a Data Request by staff, the project owner has contacted the Ceres Unified School District to obtain information necessary to determine an adequate traffic control plan for avoiding impacts on school bus service in the area (*Data Response Set 1A*; September 14, 2009).

Staff proposes Condition of Certification **TRANS-1** which would require the applicant to coordinate with the Ceres United School District and prepare a traffic control plan designed to ensure school bus routes are not negatively affected by construction traffic. (E-mail from Nancy Krigbaum, Office of Director of Transportation, Ceres Unified School District, to Marie McLean, July 7, 2009, Subject: School Bus Traffic Routes). See **Traffic and Transportation Figure 3** for location of school bus stops.

Transport of Hazardous Materials and Waste

The transportation and handling of hazardous materials associated with the proposed A2PP project could result in roadway hazards. However, the potential impacts can be mitigated to less than a significant level by complying with existing federal and state standards for transporting hazardous substances. For example, California has developed general requirements for transporting hazardous materials. In general, those requirements may be found in the California Vehicle Code beginning with Section 31301 and continuing through Section 32053. In addition, the federal government has included in the Code of Regulations, Title 49, regulations for transporting hazardous materials as has the California Highway Patrol.

For example, the California Department of Motor Vehicles exclusively licenses all drivers who transport hazardous materials. Drivers are also required to check for weight limits and conduct period brake inspections. Commercial truck operators who handle hazardous materials are also required to take instruction in first aid and procedures for handling hazardous waste spills.

Drivers who transport hazardous waste must carry a manifest that is reviewed by the California Highway Patrol at inspection stations along major highways, including interstate highways. In addition, the manifest must be available for review in the event of a spill.

In the AFC, the applicant indicated that the transportation of hazardous materials will be carried out according to local, state, and federal regulations (AFC, A2PP, May 2009, p. 5.12-20.) The applicant also indicated that two to three deliveries of hazardous materials are expected per week during the operation of A2PP. These materials include anhydrous ammonia, cleaning chemicals, lubricating oil and filters, and water-treatment chemicals.

Those materials will be transported as hazardous materials or hazardous waste. And their transport will be arranged with Caltrans and conducted according to relevant transportation regulations. See the **Waste Management**, **Worker Safety and Fire Protection**, and **Hazard Materials** sections of this assessment for additional information.

Airport Operations

As indicated in this staff analysis, the closest airport to the project site is the Modesto City-County Airport, which is located approximately 20,000 feet northeast of the site. Approximately 200 general aviation aircraft are based at this airport. SkyWest Airlines operates regularly scheduled flights between Modesto and San Francisco International Airport. An average of 235 aircraft operations per day occurred at the Modesto City-County Airport in 2007.

The airport's two runways—10/28R, oriented in a general northwest-southeast direction and is designed for aircraft to land in either direction, and 10/28, designed for aircraft to land at 100 degrees and 280 degrees—are approximately 97 feet above mean sea level (amsl). A2PP is located approximately 20,000 feet southwest of runway 10/28 at 80 feet above mean sea level.

As indicated, A2PP is located approximately 20,000 feet from the airport. In addition, the plant will not be located within any airport flight patterns, approach, or transitional surface zones. Neither is it located in congested airspace.

Federal Aviation Regulation Part 77 establishes requirements for determining the effect of proposed structures on air navigation. In general, the FAA must be notified if the height or outward or upward slope of the proposed structure exceeds certain restrictions or the structure proposed is more than 200 feet above ground level at the site, among other criteria.

Applicant has performed calculations as required by the FAA to determine requirements for exemption from FAA notification through FAA Form 7460-1. Staff has reviewed the requirements for filing with the Federal Aviation Administration (FAA) FAA Form 7460-1, Notice of Proposed Construction, and concludes with the applicant that the filing of FAA Form 7460-1 is not necessary for the following reasons:

1. The three 80-foot stacks at an elevation of 81.6 feet do not exceed the FAA's 200-foot requirement.
2. The slope ratio as calculated by the FAA Notice of Criteria Tool indicates the Notice Criteria has not been exceeded.
3. A2PP does not require construction of a highway, railroad, waterway, and so forth, and neither will it be in an instrument approach area that might exceed FAA requirements or be located on an airport or heliport.

Ground-Level Water Vapor Plumes

Water vapor plumes generally result from plants with a heat recovery steam generator (HRSG) or cooling tower. A2PP is designed to be a simple-cycle plant with a selective catalytic reactor (CTG).The CTG is designed to produce hot exhaust that will not condense as a plume. Consequently, ground-level water vapor plumes that could affect roadway traffic will not occur during the operation of A2PP.

Emergency Services Vehicle Access

The Ceres Fire Department, Station Number 3, located at 420 East Service Road, in Ceres, would provide 24-hour fire protection and emergency medical services to the site. The station is approximately 0.3 mile from the project site. Access to the site would be through Crows Landing Road. Response time would be approximately two to three minutes in daylight hours and three to four minutes in nighttime hours. For a more detailed discussion of emergency services concerning adequate ingress/egress serving the facility, see the **Worker Safety and Fire Protection** section of this assessment.

CUMULATIVE IMPACTS

A cumulative impact results from changes in the environment caused by the proposed project in combination with changes resulting from other closely related past, present, and reasonable foreseeable future projects. Information about cumulative impacts is organized into two sections, Past, Present, and Future Projects and Environmental Justice.

Past, Present, and Future Projects

A number of projects are proposed for development within two miles of the A2PP site. Those projects could contribute to cumulative effects. These projects include industrial and residential projects. Those projects are in the planning stages at this time and a timeframe for development is not known at this time.

However, one project, the Whitmore Overpass and Utility Relocations, located approximately two miles from the project site, is currently in progress and is expected to be completed in 2011. The existing two-lane overpass will be replaced with a four-lane structure and the road will be widened to four lanes from Mitchell to Blaker. The Whitmore overpass will remain open as a two-lane road throughout construction. (Personal conversation with Marie McLean and Leisser Mazariegos, Assistant Engineer, City of Ceres, November 12, 2009). However, A2PP traffic and the Whitmore Overpass and Utility Relocations project will not result in a cumulative impact because the Whitmore overpass as well as connecting roads will remain open during construction.

Environmental Justice

Staff has considered the minority populations (as identified in **Socioeconomics Figure 1**) and low income populations in its impact analysis. No significant direct or cumulative traffic and transportation impacts would occur. Therefore, the project will not result in any traffic and transportation-related environmental justice issues.

COMPLIANCE WITH LORS

The applicant has stated its intention to comply with all applicable LORS (A2PP AFC, May 2009, Section 5.12.84) Staff has concluded that the project as proposed would comply with relevant LORS. **Traffic and Transportation Table 9** includes a summary of the project's conformance with all applicable LORS.

TRAFFIC AND TRANSPORTATION Table 9
Project Compliance with Adopted Traffic and Transportation LORS

Applicable LORS	Description
Federal Title 14, Code of Federal Regulations (CFR) Chapter 1, Part 77	Includes standards for determining obstructions in navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alteration. Also, provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace.
	Consistent: The nearest airport facility is the Modesto City-County Airport, located approximately 20,000 feet northeast of the site. The existing flight pattern does not bring aircraft at low altitude over the project site and none of the project's structures would penetrate any navigable airspace.
Title 49, Subtitle B	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures) and provides safety measures for motor carriers and motor vehicles that operate on public highways.
	Consistent: Enforcement is conducted by state and local law enforcement agencies and through state agency licensing and ministerial permitting (e.g., California Department of Motor Vehicles licensing, Caltrans permits), and/or local agency permitting (e.g., Stanislaus County Department of Public Works).

State California Vehicle Code, Division 2, Chapter 2.5; Div. 6, Chap. 7; Div. 13, Chap. 5; Div. 14.1, Chap. 1 & 2; Div. 14.8; Div. 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
	Consistent: Enforcement is provided by state and local law enforcement agencies and through ministerial state agency licensing and permitting and/or local agency permitting.
California Streets and Highway Code, Division 1 & 2, Chapter 3 & Chapter 5.5	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits.
	Consistent: Enforcement is provided by state and local law enforcement and through ministerial state agency licensing and permitting and/or local agency permitting.
California Department of Transportation (Caltrans) LOS Policy	Consistent: With the implementation of proposed condition of certification **TRANS-2**, LOS D will be maintained for highways and intersections located within Caltrans jurisdiction.
Local City of Ceres Circulation Element	Requires LOS D or better operating conditions for primary collectors, arterials, expressways, freeways, and intersections. LOS C is required for secondary collectors and local streets.
	Consistent: As reflected in Traffic and Transportation Table 2, existing conditions for roadway segments level of service (LOS) operates at or above acceptable levels.
County of Stanislaus Circulation Element	Requires LOS C or better operating conditions for city intersections and roadways.
	Consistent: As reflected in Traffic and Transportation Table 8, the LOS along certain identified roadway intersections along the construction designated roadways would remain above the LOS D threshold requirement, The applicant will be required to construction traffic control plan to include methods of reducing construction project impacts on local roadways that exceed LOS on various roadways that are proposed roadways designated for construction routes. Therefore will be in compliance with the county's congestion management plan.

CONCLUSIONS

1. As discussed in this analysis, the project with staff's proposed conditions of certifications would comply with all applicable LORS related to traffic and transportation.
2. Modesto City-County Airport is located approximately 20,000 feet northeast of the site. A2PP will consist of three 80-foot stacks at an elevation of 81.6 feet. The height of these three stacks combined with the elevation at which they are located do not exceed the FAA's 200-foot requirement. Consequently, the project would not impact aviation safety.
3. Staff is proposing Condition of Certification **TRANS-1** to require the applicant to coordinate with the Ceres Unified School District to ensure construction traffic does not interfere with school bus routes.
4. Staff is proposing Condition of Certification **TRANS-2** to require a construction traffic control plan to ensure that all construction traffic does not significantly affect traffic on any local roads, intersections, or access to adjoining and neighboring sites.

5. Staff is proposing Condition of Certification **TRANS-3** which would require a mitigation plan to repair portions of Mitchell Road, East Hatch Road, and Crows Landing Road if they are damaged by project-related traffic.
6. With staff's proposed conditions of certification, no significant direct or cumulative traffic and transportation impacts would occur.

PROPOSED CONDITIONS OF CERTIFICATION

School Bus Stops

TRANS-1 The applicant shall in with coordination with the Ceres Unified School District shall prepare and implement a traffic control plan designed to ensure school bus routes are not negatively affected by construction traffic. Mitigation measures may include travel times for workers as well as equipment and materials outside of school bus travel times, as well as a program to train construction workers about bus stop and student safety.

Verification: At least 60 days before the start of site mobilization, the project owner shall submit the traffic control plan to the city of Ceres and the San Joaquin County Public Works Division for review and comment and to the CPM for review and approval.

Traffic Control Plan

TRANS-2 The project owner shall prepare a construction traffic control and implementation plan for the project and its associated facilities. The project owner shall consult with the affected local jurisdiction(s), city of Ceres, Lodi, Caltrans, and San Joaquin County Public Works Department, in the preparation of the traffic control and implementation plan.

The traffic control and implementation plan shall include and describe the following minimum requirements:

- Timing of heavy equipment and building materials deliveries and related hauling routes
- Redirecting construction traffic with a flag person;
- Signing, lighting, and traffic control device placement;
- Timing of construction work hours and arrival/departure intervals outside of peak traffic periods
- Ensuring safe access to the main entrance
- Ensuring access for emergency vehicles to the project site
- Closing of travel lanes on a temporary basis
- Ensuring access to adjacent commercial and industrial properties during the construction of all linears
- Closing of travel lanes on a temporary basis
- Devising a construction workforce ride-sharing plan

- Providing a shuttle service from the most distant off-street parking areas

The project owner shall submit the proposed traffic control and implementation plan to the affected local jurisdiction, San Joaquin County and Caltrans for review and comment. The project owner shall provide to the CPM a copy of the transmittal letter submitted to the affected local jurisdiction, and Caltrans requesting their review of the traffic control and implementation plan. The project owner shall provide any comment letters to the CPM for review and approval.

Verification: At least 60 days prior to start of site mobilization, the project owner shall provide to the city of Ceres; San Joaquin County; Caltrans; and the California Highway Patrol for review and comment and to the CPM for review and approval, a copy of the construction traffic control plan. The plan must document consultation with these agencies.

Road Mitigation Plan

TRANS-3 Prior to site mobilization activities, the project owner shall prepare a mitigation plan for State Route 99; State Route 132; Crows Landing Road; Service Road; Whitmore Avenue; Hatch Road; and Mitchell Road . The intent of this plan is to ensure that if these roadways are damaged by project construction, they will be repaired and reconstructed to original or as near original condition as possible. This plan shall include:

- Documentation of the pre-construction condition State Route 99; State Route 132; Crows Landing Road; Service Road; Whitmore Avenue; Hatch Road, and Mitchell Road. Prior to the start of site mobilization, the project owner shall provide to the CPM photographs or videotape of these roadways.
- Documentation of any portions of State Route 99; State Route 132; Crows Landing Road; Service Road; Whitmore Avenue; Hatch Road; and Mitchell Road that may be inadequate to accommodate oversize or large construction vehicles and identification of necessary remediation measures; and
- Reconstruction of portions of State Route 99; State Route 132; Crows Landing Road; Service Road; Whitmore Avenue; Hatch Road; and Mitchell Road that are damaged by project construction due to oversize or overweight construction vehicles.

Verification: At least 90 days prior to the start of site mobilization, the project owner shall submit a mitigation plan focused on restoring State Route 99; State Route 132; Crows Landing Road; Service Road; Whitmore Avenue; Hatch Road; and Mitchell Road to its pre-project condition to Caltrans; County of San Joaquin Public Works Department; and the city of Ceres Public Works Department for review and comment and to the CPM for review and approval.

Within 90 days following the completion of construction, the project owner shall provide photo/videotape documentation to the city of Ceres Planning Department, Caltrans,

County of San Joaquin Public Works Department and the CPM that the identified damaged sections of roadways have been restored to their pre-project condition.

REFERENCES

Application for Certification, TID Almond 2 Power Plant, Turlock Irrigation District, May 2009.

California Department of Transportation, Traffic and Vehicle Data Systems Unit, 2007 All-Traffic Volumes on CSHS; http:www.dot.ca.gov/hqtrafficops/saferesr/trafdata/2007all.htm.

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CH2MHILL2009k – CH2MHILL/S. Madams (tn: 54257). Data Responses Set 1D, Responses to CEC Staff Data Requests 18 & 77-79. Dated 11/25/09. Submitted to CEC/Docket Unit on 11/25/09.

E-mail from Nancy Krigbaum, Ceres Unified School District, to Marie McLean, July 7, 2009, regarding school bus traffic routes.

Transportation Research Board. 2000. *Highway Capacity Manual 2000.*

APPENDIX A

HIGHWAY CAPACITY MANUAL

The *Highway Capacity Manual* is prepared by the Transportation Research Board, Committee on Highway Capacity and Quality of Service. It represents a concentrated, multi-agency effort by the Transportation Research Board, the Federal Highway Administration, the American Association of Highway and Transportation Officials, and other traffic/transportation related agencies. It is the most widely used resource for traffic analysis. Several versions of the *Highway Capacity Manual* (*HCM*) have been published. The current edition was published in 2000. It contains concepts, guidelines, and procedures for computing the capacity and quality of service of various highway facilities, including freeways, signalized and unsignalized intersections, and rural highways, and the effects of transit, pedestrians, and bicycles on the performance of these systems.

Level of Service

The description and procedures for calculating capacity and level of service are found in the *Highway Capacity Manual 2000*. The *Highway Capacity Manual 2000* represents the latest research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with level of service A representing the best operating conditions and level of service F, the worst. Each level of service represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish service levels. A general description of service levels for various types of facilities is shown in **Table A**.

Table A
Level of Service Description

Facility Type	Uninterrupted Flow	Interrupted Flow
	Freeways Multi-Lane Highways Two-Lane Highways Urban Streets	Signalized Intersections Unsignalized Intersections - Two-Way Stop Control - All-Way Stop Control
Level of Service		
A	Free-flow.	Very low delay
B	Stable flow. Presence of other users noticeable.	Low delay
C	Stable flow. Comfort and convenience starts to decline.	Acceptable delay
D	High density stable flow.	Tolerable delay
E	Unstable flow.	Limit of acceptable delay
F	Forced or breakdown flow.	Unacceptable delay

Source: *Highway Capacity Manual 2000*

Interrupted Flow

One of the more important elements limiting, and often interrupting, the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals and stop and yield signs. These all operate quite differently and have differing impacts on overall flow.

Signalized Intersections

The capacity of a highway is related primarily to the geometric characteristics of the facility, as well as to the composition of the traffic stream on the facility. Geometrics are a fixed, or non-varying, characteristic of a facility.

At the signalized intersection, an additional element is introduced into the concept of capacity: time allocation. A traffic signal essentially allocates time among conflicting traffic movements seeking use of the same physical space. The way in which time is allocated has a significant impact on the operation of the intersection and on the capacity of the intersection and its approaches.

Level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, driver frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions (that is, in the absence of traffic control, geometric delay, any incidents, and any other vehicles). Specifically, level of service criteria for traffic signals is stated in terms of average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the ratio of green time to cycle length, and the volume to capacity ratio for the lane group.

For each intersection analyzed, the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A level of service designation is given to the control delay to better describe the level of operation. Descriptions of levels of service for signalized intersections can be found in **Table B**.

Table B
Description of Level of Service for Signalized Intersections

Level of Service	Description
A	Very low control delay, up to 10 seconds per vehicle. Movement forward (progression) is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop, causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase does not serve a waiting line of vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle, the limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation and arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: *Highway Capacity Manual 2000*

The use of control delay, often referred to as signal delay, was introduced in the 1997 update to the *Highway Capacity Manual*. It represents a departure from previous updates. In the third edition of the *Highway Capacity Manual*, published in 1985 and the 1994 update to the third edition, delay only included stop delay. Thus, the level of service criteria listed in Table B differs from earlier criteria.

Unsignalized Intersections

The current procedures on unsignalized intersections were first introduced in the 1997 update to the *Highway Capacity Manual* and represent a revision of the methodology published in the 1994 update to the 1985 Highway Capacity Manual. The revised procedures use control delay as a measure of effectiveness to determine level of service. Delay is a measure of driver discomfort, driver frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions (that is, in the absence of traffic control, geometric delay,

any incidents, and any other vehicles). Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Two-Way Stop Controlled Intersections

Two-way stop controlled intersections, in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At two-way stop-controlled intersections, the stop-controlled approaches are referred to as the *minor street approaches* and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the *major street approaches*.

The capacity of movements subject to delay is determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A level of service designation is given to the expected control delay for each minor movement. Level of service is not defined for the intersection as a whole. Control delay is the increased time of travel for a vehicle approaching and passing through an all-way stop-controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. A description of levels of service for two-way stop-controlled intersections is found in **Table C**.

Table C
Description of Level of Service for Two-Way Stop Controlled Intersections

Level of Service	Description
A	Very low control delay: less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay: greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay: greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay: greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of acceptable control delay: greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay: in excess of 50 seconds per vehicle for each movement subject to delay.

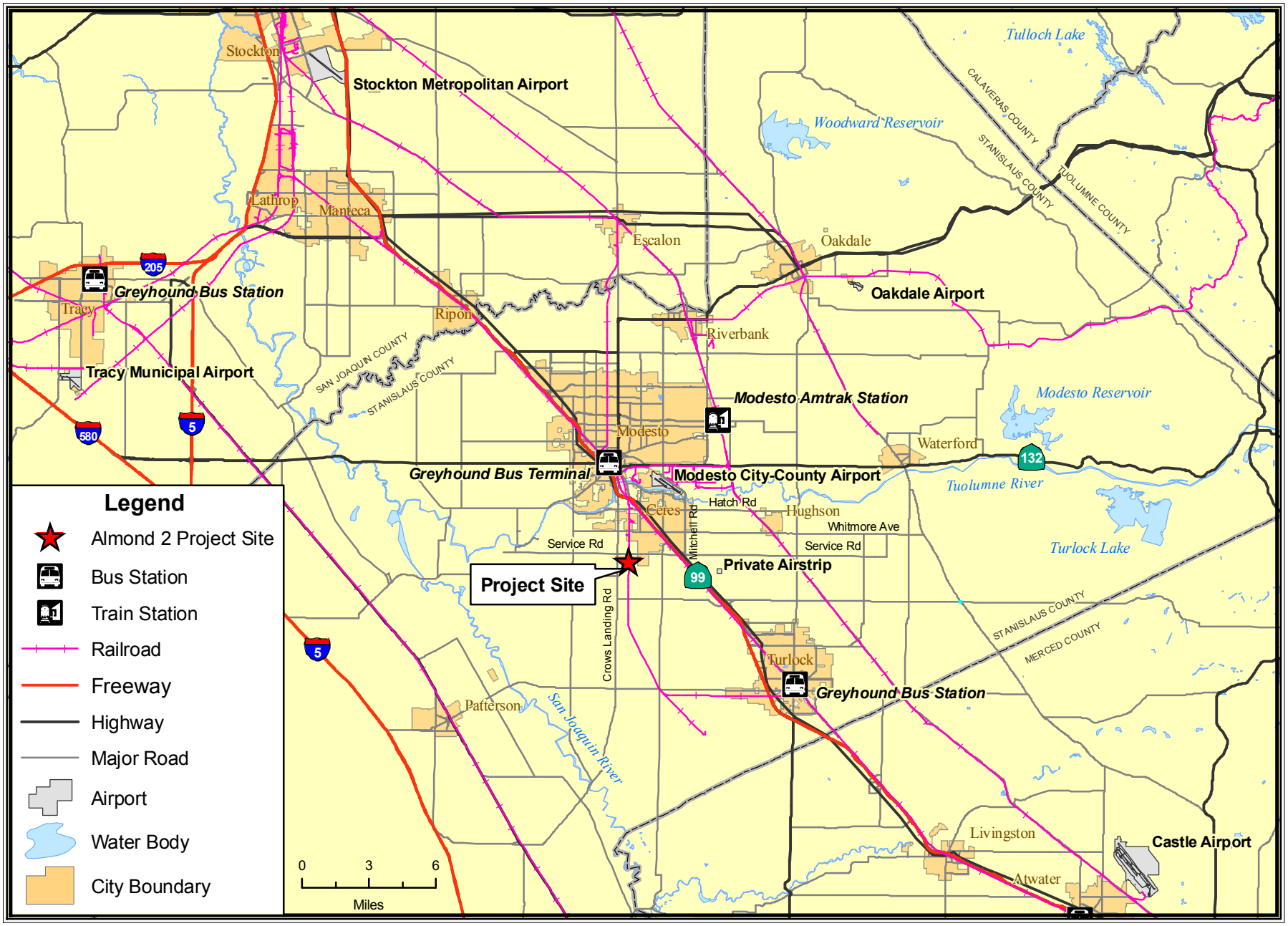
Source: *Highway Capacity Manual 2000*

REFERENCE

Transportation Research Board. *Highway Capacity Manual 2000*. Washington, D.C.

TRAFFIC AND TRANSPORTATION - FIGURE 1

Almond 2 Power Plant Project - Regional Transportation Network

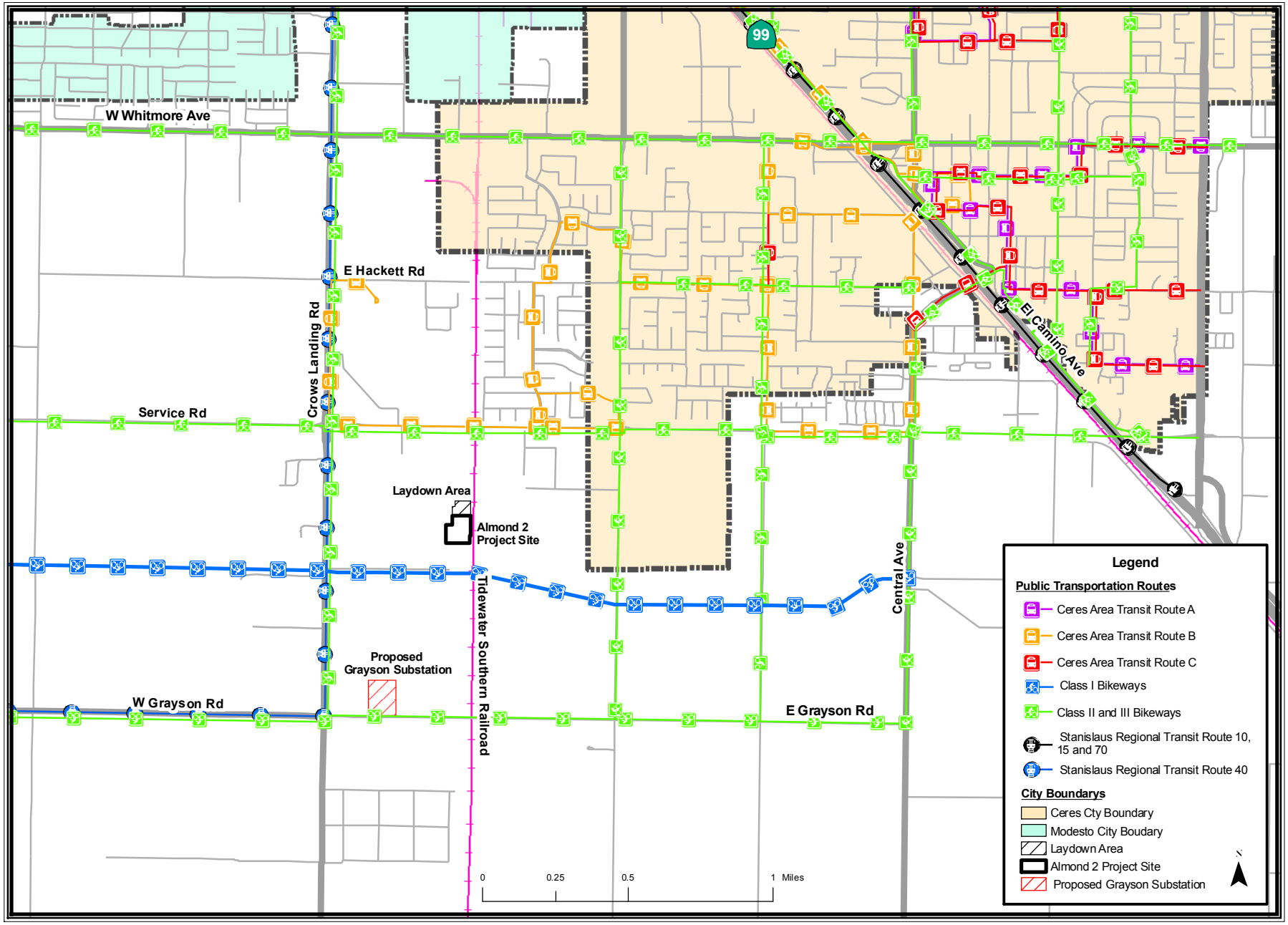


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: California Energy Commission

TRAFFIC AND TRANSPORTATION - FIGURE 2

Almond 2 Power Plant Project - Local Transportation Network



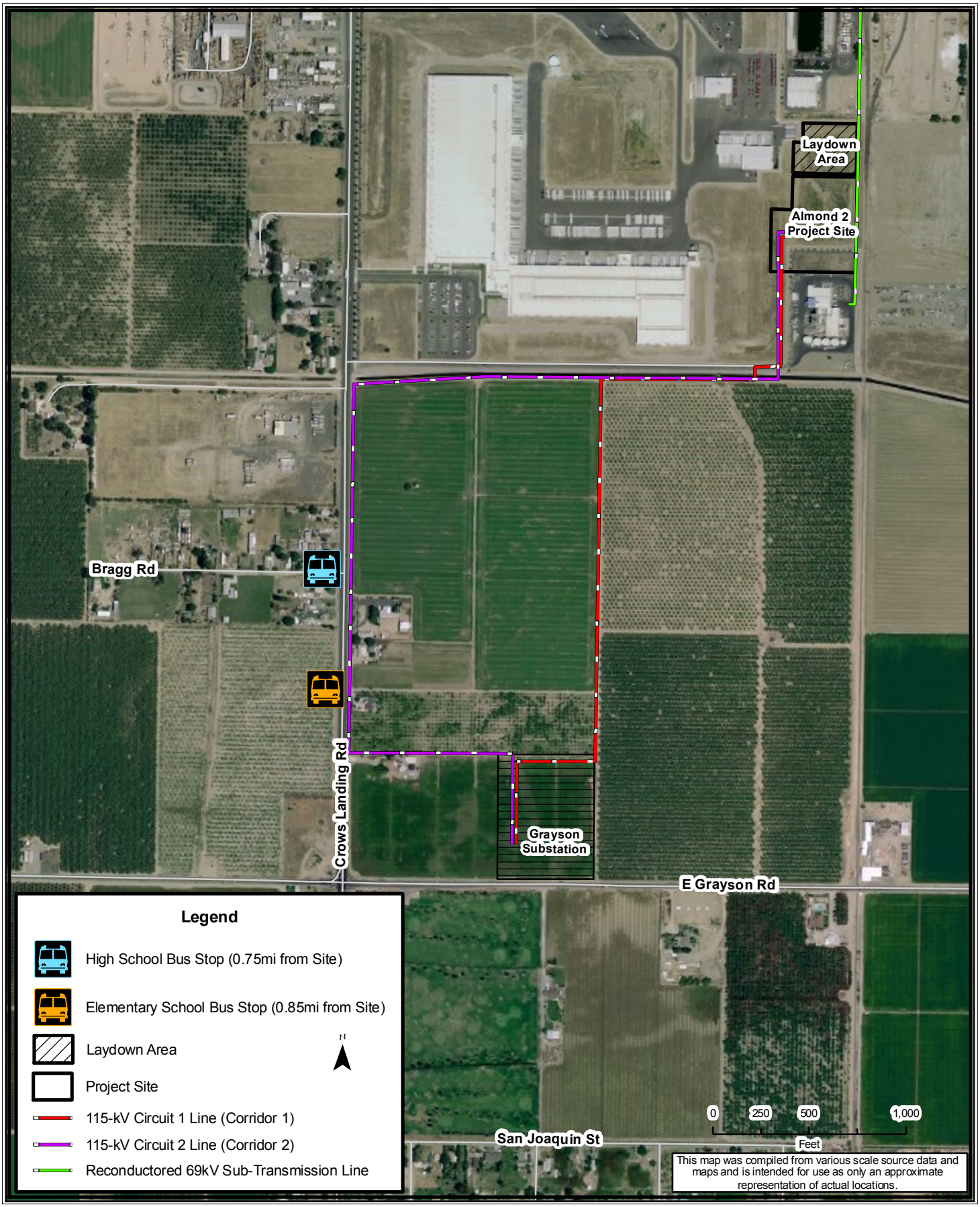
TRAFFIC AND TRANSPORTATION

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: California Energy Commission

TRAFFIC AND TRANSPORTATION - FIGURE 3

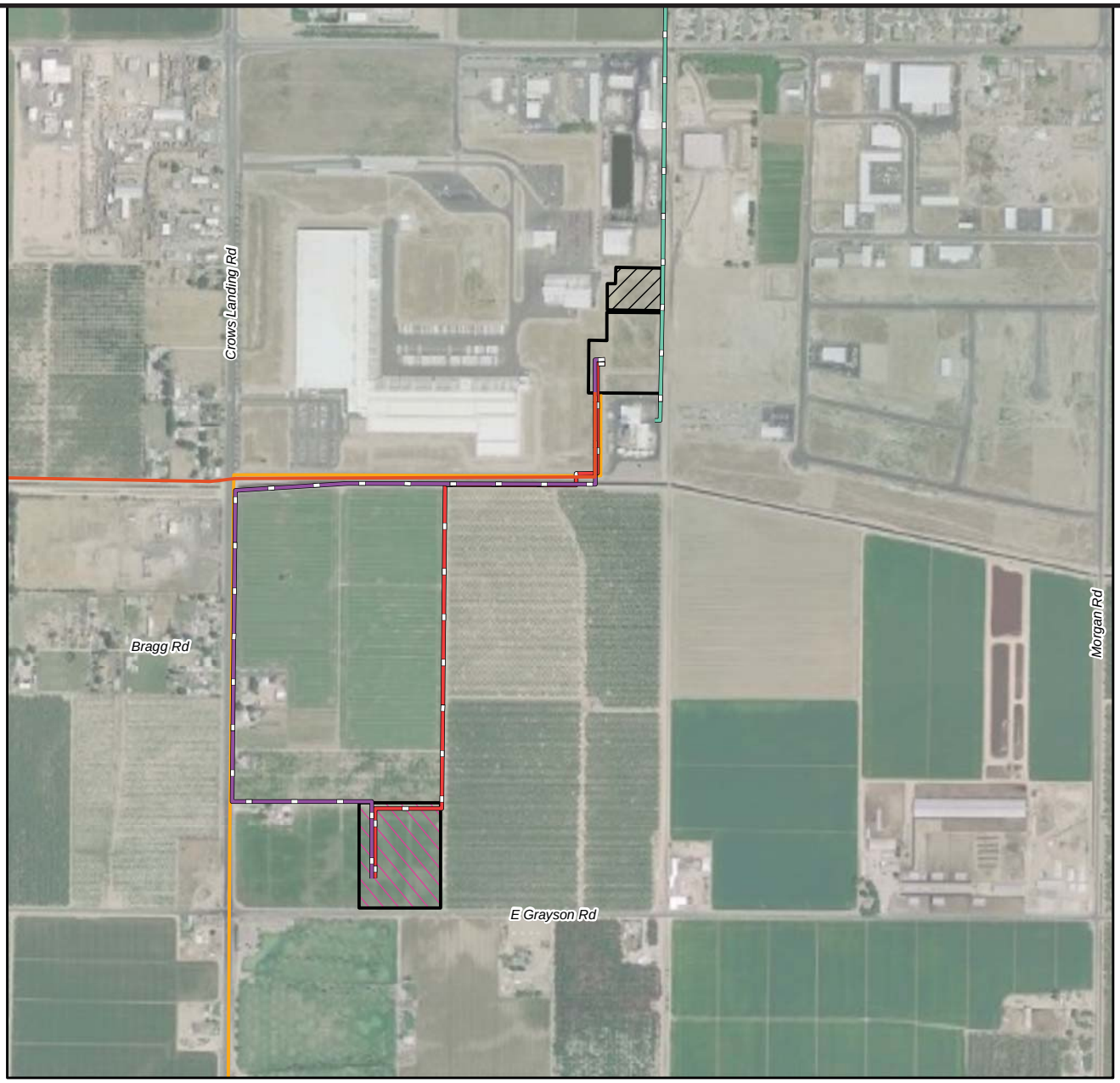
Almond 2 Power Plant Project - School Bus Locations



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: CH2MHILL

TRAFFIC AND TRANSPORTATION - FIGURE 4
Almond 2 Power Plant Project - Linear Routes



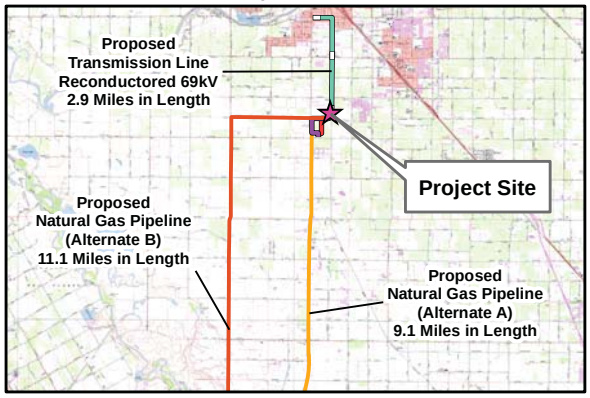
LEGEND

- Natural Gas Pipeline (Alternate A)
- Natural Gas Pipeline (Alternate B)
- 115-kV Circuit 1 Line (Corridor 1)
- 115-kV Circuit 2 Line (Corridor 2)
- Reconductored 69kV Sub-Transmission Line
- Proposed Grayson Substation
- Laydown Area
- Project Site

N

0 500 1,000
Feet

VICINITY MAP



Note:
The Grayson Substation is being developed as a separate Project

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SOURCE: AFC Figure 1.1-3

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

SUMMARY OF CONCLUSIONS

The applicant, Turlock Irrigation District (TID) proposes to transmit the power from the proposed Almond 2 Power Plant (A2PP) to the transmission grid through TID's proposed Grayson Substation approximately 3,300 feet southwest of the site. The two new overhead 115-kV lines to be used would be located in separate corridors that would traverse mostly agricultural land and areas of commercial and industrial uses and scattered single-family residences. Building and operating A2PP would require reconductoring to upgrade the existing 2.9-mile 69-kV sub-transmission line extending from the existing Almond Power Plant to TID's Crows Landing Substation to the northwest. The absence of residences in the immediate vicinity of the proposed 115-kV line and the Almond-Crows Landing line upgrade means that there would not be the residential electric and magnetic field exposures that in recent years have raised concern about human health effects. The proposed new and upgraded lines would be operated in the TID service area. Therefore, their design, erection, and maintenance would be according to standard TID practices, which conform to applicable laws, ordinances, regulations and standards (LORS). With the five proposed conditions of certification, any line-related safety and nuisance impacts would be less than significant.

INTRODUCTION

The purpose of this analysis is to assess the proposed lines' design and operational plan to determine whether their related field and non-field impacts would constitute a significant environmental hazard in the area around the proposed routes. All related health and safety LORS are currently aimed at minimizing such hazards. Staff's analysis focuses on the following issues taking into account both the physical presence of the line and the physical interactions of its electric and magnetic fields:

- aviation safety;
- interference with radio-frequency communication;
- audible noise;
- fire hazards;
- hazardous shocks;
- nuisance shocks; and
- electric and magnetic field (EMF) exposure.

The following federal, state, and local laws and policies apply to the control of the field and non-field impacts of electric power lines. Staff's analysis examines the project's compliance with these requirements.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

TRANSMISSION LINE SAFETY AND NUISANCE (TLSN) TABLE 1
Laws, Ordinances, Regulations and Standards (LORS)

Applicable LORS	Description
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, " Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal	
Title 47, CFR, Section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Audible Noise	
Local	
Stanislaus County Code.	Sets noise limits for specific land uses.
Ceres City Municipal Code.	Sets sound level limits at residences and outdoor activity areas.
City of Ceres Noise Element.	Sets noise limits for sensitive land uses.
Hazardous and Nuisance Shocks	
State	
CPUC GO-95, "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.
Title 8, California Code of Regulations (CCR) Section 2700 et seq. "High Voltage Safety Orders"	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Industry Standards	
Institute of Electrical and Electronics Engineers (IEEE) 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations"	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State	
GO-131-D, CPUC "Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California"	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision 93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.

Applicable LORS	Description
Industry Standards	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State	
14 CCR Sections 1250-1258, "Fire Prevention Standards for Electric Utilities"	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

SETTING

According to the applicant (TID 2009a, pp. 1-1, 2-1, 2-2, 2-7, 5.6-1, and 5.7-4), the site for the proposed A2PP is a 4.6-acre land approximately 2 miles southwest of the center of the City of Ceres, Stanislaus County, California in an area zoned for industrial development. The site is adjacent to the existing Almond Power Plant to the south and was chosen in part for this proximity which would allow for a sharing of several existing power plant-related facilities. The two project-related 115-kV overhead transmission lines would traverse an agricultural area, commercial and industrial areas, and areas with a few rural residences as they proceed from the on-site switchyard to their respective connecting points at the proposed Grayson Substation 3,300 feet to the southwest. This Grayson Substation would be a part of TID's Hughson-Grayson 115-kV Transmission Line and Substation Project which is not a part of the proposed T2PP but would be completed before T2PP becomes operational.

The two proposed 115-kV T2PP lines would be located in separate corridors. Corridor 1 would be 0.9 miles long with Corridor 2 1.2 miles long. The routes would run through agricultural areas, commercial and industrial areas, as well as areas of scattered rural dwellings the nearest of which would be approximately 0.3 miles to the northeast. Such distance from area residences means that there would not be the residential field exposures that have been of health concern in recent years. The existing Almond-Crows Landing 69-kV sub-transmission line that would be upgraded as a result of A2PP stretches 2.9 miles as it connects the Almond Power Plant to the Crows Landing Substation. The proposed 115-kV A2PP line would run within its own right-of-way in some locations and near the corridor of an existing area 230-kV line in others. The line would thus contribute fields in areas with and without existing lines.

PROJECT DESCRIPTION

According to information from the applicant (TID 2009a, 2-53 through 2-55) the proposed T2PP transmission project would consist of the components listed below:

- One new overhead 115-kV line that would separate into two segments (one of 0.9 miles and the other of 1.2 miles) after leaving the T2PP site towards the proposed Grayson Substation to the northwest;
- The project's on-site 115-kV switchyard from which the conductors would extend to the connection points at the Grayson Substation; and

- A project-related upgrade of the existing 69-kV single-circuit line connecting the existing Almond Power Plant to TID's Crows Landing Substation to the southwest.

The proposed new 115-kV line and upgraded 69-kV line would be connected to the power grid of the area's main service utility TID. Therefore their conductors would be standard low-corona aluminum alloy cables typical of area TID lines. The new 115-kV lines would be supported on wood or steel structures with design and construction in keeping with TID's guidelines that ensure line safety and efficiency together with reliability, and maintainability. The maximum height would be 80 feet.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

The potential magnitude of the line impacts of concern in this staff analysis depends on compliance with the listed LORS. These LORS have been established to maintain impacts below levels of potential significance. Thus, if staff determines that the project would comply with applicable LORS, we would conclude that any transmission line-related safety and nuisance impacts would be less than significant. The nature of these individual impacts is discussed below together with the potential for compliance with the LORS that apply.

DIRECT IMPACTS AND MITIGATION

Aviation Safety

Any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace and the need to file a "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA as noted in the LORS section. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved.

As noted by the applicant (TID 2009a, p. 3-28), the nearest public airport to A2PP and related facilities is the Modesto City-County Airport approximately 3.8 miles to the north. At a maximum of 80 feet, the height of the proposed transmission line supports would far less the FAA threshold of 200 feet that triggers the concern over aviation safety. All other area military and civilian airports are too far from T2PP for the proposed lines and related facilities to pose an aviation hazard to utilizing aircraft. Therefore, staff does not recommend any related condition of certification.

Interference with Radio-Frequency Communication

Transmission line-related radio-frequency interference is one of the indirect effects of line operation and is produced by the physical interactions of line electric fields. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge, but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or

interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts is therefore minimized by reducing the line electric fields and locating the line away from inhabited areas.

The proposed project lines would be built and maintained in keeping with standard TID practices that minimize surface irregularities and discontinuities. Moreover, the potential for such corona-related interference is usually of concern for lines of 345-kV and above, and not for the 115-kV and 69-kV lines that are proposed to be built or upgraded. The proposed low-corona designs are used for all TID lines of similar voltage ratings to reduce surface-field strengths and the related potential for corona effects. Staff does not expect any corona-related radio-frequency interference or related complaints in the general project area with no residences. However, staff recommends Condition of Certification **TLSN-2** to ensure mitigation as required by the FCC in the unlikely event of complaints.

Audible Noise

The noise-reducing designs related to electric field intensity are not specifically mandated by federal or state regulations in terms of specific noise limits. As with radio noise, such noise is limited instead through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability. Audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345-kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345-kV as proposed for A2PP. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a right-of-way of 100 feet or more. Since the low-corona designs are also aimed at minimizing field strengths, staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed line and related facilities, please refer to staff's analysis in the **Noise and Vibration** section.

Fire Hazards

The fire hazards addressed through the related LORS in **TLSN Table 1** are those that could be caused by sparks from conductors of overhead lines, or that could result from direct contact between the line and nearby trees and other combustible objects.

Standard fire prevention and suppression measures for similar TID lines would be implemented for the proposed project lines (TID 2009a, p.3-41). The applicant's intention to ensure compliance with the clearance-related aspects of CPUC General Order 95 (GO-95) would be an important part of this mitigation approach. Moreover, the line would traverse a mostly agricultural or commercial area with no trees of sufficient size to pose a contact-related fire hazard. Condition of Certification **TLSN-4** is recommended to ensure compliance with important aspects of the fire prevention measures.

Hazardous Shocks

Hazardous shocks are those that could result from direct or indirect contact between an individual and the energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

The applicant's stated intention to implement the GO-95-related measures against direct contact with the energized line (TID 2009a, p. 3-12) would serve to minimize the risk of hazardous shocks. Staff's recommended Condition of Certification **TLSN-1** would be adequate to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line's electric and magnetic fields.

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). For the proposed project lines, the project owner will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way.

The potential for nuisance shocks around the proposed lines would be minimized through standard industry grounding practices (TID 2009a, p. 3.2-27 and 3-28). Staff recommends Condition of Certification **TLSN-5** to ensure such grounding.

Electric and Magnetic Field Exposure

The possibility of deleterious health effects from EMF exposure has increased public concern in recent years about living near high-voltage lines. Both electric and magnetic fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as

evaluated by the CPUC, other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. Most regulatory agencies believe, as staff does, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore, considers it appropriate in light of present uncertainty, to recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

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

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- There are measures that can be employed for field reduction, but they can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures.

State's Approach to Regulating Field Exposures

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

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

measured for lines of similar voltage and current-carrying capacity, such field strength values can be used by staff and other regulatory agencies to assess the effectiveness of the applied reduction measures. These field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the support structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required by the CPUC to be designed according to the EMF-reducing guidelines of the electric utility in the service area involved, its fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the proposed project line according to existing TID field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management.

The CPUC recently revisited the EMF management issue to assess the need for policy changes to reflect the available information on possible health impacts. The findings specified in Decision D.06-1-42 of January 26, 2006, did not identify a need for significant changes to existing field management policies. Since there are no residences in the immediate vicinity of the proposed project lines, there would not be the long-term human residential EMF exposures mostly responsible for the health concern of recent years. The only project-related EMF exposures of potential significance are the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the immediate vicinity of the line. These types of exposures are short term and well understood as not significantly related to the health concern.

Industry's and Applicant's Approach to Reducing Field Exposures

The present focus is on the magnetic field because only it can penetrate the soil, buildings and other materials to potentially produce the types of health impacts at the root of the health concern of recent years. As one focuses on the strong magnetic fields from the more visible overhead transmission and other high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S. Department of Energy, 1998). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short-term, while the exposure from power lines are lower level, but long-term. Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

As with similar TID lines, specific field strength-reducing measures would be incorporated into the design of the proposed lines to ensure the field strength minimization currently required by the CPUC in light of the concern over EMF exposure and health.

The field reduction measures to be applied include the following:

1. Increasing the distance between the conductors and the ground to an optimal level;
2. Reducing the spacing between the conductors to an optimal level;
3. Minimizing the current in the line; and
4. Arranging current flow to maximize the cancellation effects from interacting of conductor fields.

The applicant has calculated the maximum field strengths at representative points along the proposed routes to reflect the potential contribution of A2PP's 115-kV lines and the reconductored 69-kV Almond-Crows Landing line to area EMF levels. Maximum field intensities would be from the proposed 115-kV lines and not the reconductored, lower-voltage 69-kV line. Field strengths were calculated for specific points along specific line segments (identified as Segments A, B, C, D, E and F) of this115-kV line. Maximum intensities were calculated for each segment within its own right-of-way to identify its own design-driven intensity and when close to other lines to reflect the interactive effects of fields from all conductors (TID 2009a, pp.3-27 through 3-40). The applicant has used a modet that staff has previously determined to be accurate and reliable and is used commonly to evaluate EMF field strength. As shown in Figures 3.1-5A through 3.1-5F, the maximum magnetic field intensity from the proposed line design would be 25.2 mG when alone in its right-of-way. The maximum intensity in the vicinity of the existing 230-kV line would be 82 mG which would be 8.1 mG above existing levels. The maximum electric field strength was calculated as 2.6 kV/m at the point of maximum interaction with the existing 230-kV line to reflect an increase of 0.5 kV/m. These field strengths reflect the effectiveness of TID's field-reducing designs to be applied and are similar to those of similar TID lines; therefore, staff considers further mitigation to be unnecessary, but would seek to validate the applicant's assumed reduction efficiency from the field strength measurements recommended in Condition of Certification **TLSN-3**.

CUMULATIVE IMPACTS AND MITIGATION

When field intensities are measured or estimated for a specific location, they reflect the interactive, and therefore, cumulative effects of fields from all contributing conductors. This interaction could be additive or subtractive depending on prevailing conditions. Since (a) the proposed 115-kV project line and switchyard would be designed according to applicable field-reducing TID guidelines and (b) the identified 69-kV line would be upgraded according to the same guidelines (as currently required by the CPUC for effective field management), any contribution to cumulative area exposures should be at levels expected for TID lines of similar voltage and current-carrying capacity. It is this similarity in intensity that constitutes compliance with current CPUC requirements on EMF management. The actual field strengths and contribution levels for the proposed line designs would be assessed from the results of the field strength measurements specified in Condition of Certification **TLSN-3**.

COMPLIANCE WITH LORS

As previously noted, current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility lines to be interconnected. The utility in this case is TID. Since the proposed project line would be built and the proposed upgrade made according to the respective requirements of GO-95, GO-52, GO-131-D, and Title 8, Section 2700 et seq. of the California Code of Regulations, staff considers the presented design and operational plan to be in compliance with the health and safety LORS of concern in this analysis. The actual contribution to the area's field exposure levels would be assessed from results of the field strength measurements required in Condition of Certification **TLSN-3**.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff received no public or agency comments on the transmission line nuisance and safety aspects of the proposed A2PP.

CONCLUSIONS

Since the proposed new line and line upgrade would not pose an aviation hazard according to current FAA criteria, staff does not consider it necessary to recommend location changes on the basis of a potential hazard to area aviation.

The potential for nuisance shocks would be minimized through grounding and other field-reducing measures to be implemented in keeping with current TID guidelines (reflecting standard industry practices). These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise and related complaints especially in the traversed area with no residences. The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of PUC's General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, would minimize fire hazards while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the proposed routes.

Since electric or magnetic field health effects have neither been established nor ruled out for the proposed and similar transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed lines' design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential magnetic exposure of health concern in recent years would be insignificant for the proposed lines given the absence of residences along the proposed route. On-site worker or public exposure would be short

term and at levels expected for TID lines of similar design and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

Since the proposed project lines would be operated to minimize the health, safety, and nuisance impacts of concern to staff, and would be located along a route without nearby residences, staff considers the proposed design, maintenance, and construction plan as complying with the applicable laws. With the conditions of certification proposed below, any such impacts would be less than significant.

PROPOSED CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed new 115-V line and upgrade the identified 69-kV according to the requirements of California Public Utility Commission's GO-95, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical Safety Orders, Sections 2700 through 2974 of the California Code of Regulations, and TID's EMF-reduction guidelines.

Verification: At least 30 days before starting construction of the transmission lines or related structures and facilities, the project owner shall submit to the Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

TLSN-2 The project owner shall ensure that every reasonable effort will be made to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the project-related lines and associated switchyards. The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to line operation together with the corrective action taken in response to each complaint. This record shall be submitted in an Annual Report to the Compliance Project Manager on transmission line safety and nuisance-related requirements.

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

TLSN-3 The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the line at the points of maximum intensity identified by the applicant on page 3-27, and in Figures 3.1-5A through 3.15-5F. The measurements shall be made before and after energization according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures. These measurements shall be completed not later than six months after the start of operations.

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

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

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

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

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

REFERENCES

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

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

TID 2009a-Turlock Irrigation district /R. Baysinger (tn: 51502). Application for Certification of the Almond 2 Power Plant, Volumes I and II submitted to the California Energy Commission on May 11, 2009.

VISUAL RESOURCES

Testimony of Marie McLean

SUMMARY OF CONCLUSIONS

Staff found that with recommended conditions of certification, the construction and operation of the Almond 2 Power Plant (A2PP), a natural-gas fired, simple-cycle peaking facility rated at a gross generating capacity of 174 megawatts (MW) to be constructed in Ceres, California, and operated by the Turlock Irrigation District (TID), would not result in a significant adverse aesthetic impact according to the California Environmental Quality Act (CEQA) Guidelines.

In addition, as proposed, the A2PP would comply with applicable city and county laws, ordinances, regulations, and standards (LORS) as they pertain to aesthetics and protection of sensitive visual resources

INTRODUCTION

Visual resources consist of the viewable natural and man-made features of the environment. In this section staff evaluates the impacts on visual resources resulting from the construction and operation of the A2PP. Staff bases its evaluation on information contained in the California Environmental Quality Act (CEQA) Guidelines, Aesthetics, to determine if the project would:

1. Introduce a significant impact under CEQA.
2. Comply with applicable federal, state, and local LORS pertaining to aesthetics and preservation and protection of sensitive visual resources.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

VISUAL RESOURCES Table 1 includes a listing of applicable federal, state, and local LORS pertaining to this project. Refer to the **VISUAL RESOURCES Table 2** within this analysis for staff's determination of LOR compliance.

VISUAL RESOURCES Table 2
Laws, Ordinances, Regulations, and Standards (LORS)

Source	Descriptions
Federal	
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (PL 109-59;2005). Expires 2009	A2PP is not located within or in the vicinity of federally-managed lands or in the vicinity of a recognized National Scenic Byway or All-American Road.
State	
California Streets and Highways Code, Section 260 through 263 – Scenic Highways	Ensures the protection of highway corridors that reflect the state's natural scenic beauty. The state of California has not formally designated as scenic any of the roads or highways within or adjacent to the project area.

Local	
City of Ceres 2015 General Plan Section: Major Corridors Policy 1.J.6 Section: Industrial Development Policy 1.G.4 Policy 1.G.5	A long term vision of Ceres which outlines policies, standards, and programs to guide day to day decisions concerning development through 2015. To enhance the visual quality of its major corridors by requiring new and expanding development to conceal unsightly uses and equipment, (i.e., screening of rooftop equipment and outdoor storage and undergrounding of utilities). City shall seek to minimize the adverse visual impacts of industrial development from State Route 99, primarily through landscaping and fences. City shall encourage industrial developments that include the following features: -Attractive building frontages that are readily visible for the public street (brick, wood façade). -Variation in the roofline (multi-planed, pitched roofs) -Articulation in the walls (insets, projections, canopies, wing walls, trellis) -Large parking areas with tree coverage separated into a series of smaller parking areas with the use of landscaping and the location of buildings. -Outdoor service areas, loading bays and outdoor storage areas that are not readily visible to the public. -Attractive landscaping to enhance the business by softening buildings and parking areas
City of Ceres Municipal Code Land Use and Development Standards: J2: Landscaping G: Building Height Requirements	Provides conceptual framework for the installation of public facilities, provision of public services, and future development. All uses shall provide landscaping that shall be maintained. Height of all main and accessory buildings erected in M-2 zone shall be as approved by Planning Commission.
Stanislaus County 2020 General Plan, Land Use Conservation/Open Space Element: Goal 1	To ensure the continued success of the area's leading agricultural industry. Encourage the protection and preservation of natural and scenic areas throughout the county.

SETTING

The Almond 2 Power Plant (A2PP) is located on Crows Landing Road, approximately three miles south of State Route (SR) 99, in Ceres, California, County of Stanislaus, on a 4.6-acre parcel (approximate), next to the existing 48-MW Almond Power Plant (APP). Both the A2PP and the existing APP are owned and operated by the Turlock Irrigation District (TID). The TID is the first publicly-owned irrigation district in California and one of only four districts that retails electric energy to its customers.

Access to the site from the north is from SR 99 through Crows Landing Road. From the south, access is via Keyes Road, which intersects with Crows Landing Road approximately two miles west of SR 99. See **Visual Resources Figure 1**.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section includes information about the following:

1. Method and threshold for determining significance;
2. Direct/indirect/induced impacts and mitigation;
3. Cumulative impacts and mitigation.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

To determine a project's potentially significant impacts on visual resources, Energy Commission staff reviews the project according to "Guidelines for the Implementation of the *California Environmental Quality Act:* Appendix G, "Environmental Checklist Form, Aesthetics."

Aesthetics is concerned with the quality of the visual experience. In that context, *quality* can be said to depend on the viewers' sensibilities as well as their number, location, activities, and values. Specifically, staff assesses the visual impacts resulting from the construction and operation of power plants by evaluating the project's visual or aesthetic effects on its surroundings. That assessment process involves (1) establishing the project's visual environment, primarily through Key Observation Points (KOPs); (2) assessing the visual resources of those KOPs; and (3) analyzing viewers' responses to those KOPs.[1]

As required by the guidelines, staff determines a project's impact on visual resources by evaluating whether the project would substantially:

1. Adversely affect a scenic vista.
2. Damage scenic resources, including, but not limited to, trees, rock outcroppings; historic buildings within a state scenic highway; or part of a river, stream, or estuary.
3. Degrade the existing visual character or quality of the site and its surroundings.
4. Create a new source of light or glare that would adversely affect day or night views in the area.

The following two locations were selected as KOPs:

- KOP1, Communication Lines Corridor, Looking South from Crows Landing Road
- KOP 2, View from Golf Course, Looking Southwest to Almond 2 Power Plant

[1] Key Observation Points (KOPs) are commonly used in visual analysis. In addition to the Energy Commission, other federal, state, and local agencies use KOPs when analyzing the effects of projects on visual resources. These agencies include the U.S. Department of Interior's Bureau of Land Management; the U.S. Forest Service; and the U.S. Department of Transportation; California Department of Parks and Recreation; and many California city and county planning departments.

In preparing its assessment, staff reviewed federal, state, and local laws, ordinances, regulations, and standards. Staff also evaluated the proposed project's visual impact on the existing environmental setting based on key observation points (KOPs). KOPs were selected to represent the most critical locations from which the project would be seen.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Information about direct and indirect impacts and proposed mitigation is included in this section and grouped according to the questions found in the following CEQA Environmental Checklist Form.

VISUAL RESOURCES Table 2
CEQA Environmental Checklist Form—Aesthetics

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
AESTHETICS —Would the project:				
A. Have a substantial adverse effect on a scenic vista?				X
B. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, historic buildings within a state scenic highway, or part of a river, stream, or estuary ?				X
C. Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
D. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?			X	

A. Scenic Vista

"Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?"

For the purposes of this analysis, a *scenic vista* is defined as a distant view of high pictorial quality perceived through and along a corridor or opening. No scenic vistas exist in the KOP 1 and KOP 2 view sheds.

B. Scenic Resources

"Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, historic buildings within a state scenic highway, or part of a river, stream, or estuary?"

For the purpose of this analysis, *scenic resources* include a unique water feature such as a waterfall; transitional water such as river mouth ecosystems, lagoons, coastal lakes, and brackish wetlands; or part of a stream, river, or estuary.

Staff has not identified and the city of Ceres 2015 General Plan does not identify any scenic resources in the project or the areas associated with its lineal facilities.

C. Visual Character or Quality

"Would the project substantially degrade the existing visual character or quality of the site and its surroundings?"

The visual aspects evaluated according to this criterion are organized into two categories, construction impacts and operational impacts.

Construction Impacts

The project aspects evaluated according to this criterion were project construction, power plant and transmission structures, pipelines and visible water vapor plumes.

Visually, the primary features to be introduced to the site and affected areas by the A2PP include:

1. Three 80-foot tall combustion turbine generator stacks
2. One 47-foot tall VBV (variable bypass value) air outlet
3. One 34-foot tall CTG (combustion turbine generator) inlet air housing
4. One 31-foot tall SCR (selective catalytic reduction)
5. One 15-foot tall combustion turbine
6. New building expansion continuing a structure height of 18-foot tall
7. A 71-foot tall transmission lines and switchyard facilities

Project Site

The A2PP facility is proposed to be on 4.6-acres site in the city of Ceres. Surrounding land uses include the Almond Power Plant facility to the south, a WinCo Foods distribution warehouse to the west, a farm supply facility to the north, and modular building and drilling equipment storage laydown area to the east.

The project site is composed of three parcels of land: the first parcel, a vacant disturbed parcel of land approximately 3.2-acres previously used by WinCo as a construction borrow pit which now filled and graded to the current site elevation; the second, a portion of the1.4-acre existing APP facility proposed to be used as a shared storm water retention pond for the APP and A2PP facility; and the third, portions of the existing WinCo distribution center site to be used for transmission lines and the proposed A2PP switchyard.

Construction of the power plant is expected to begin in the third quarter of 2010 and would last approximately 12 months. Construction will be scheduled to occur between 7 a.m. and 3:30 p.m. on weekdays with weekends and later hours, as needed.

Construction Laydown and Parking Area

The construction laydown and parking area—located on approximately 1.85 acres of adjacent WinCo property—would be situated directly north of the proposed A2PP facility. During the construction phase of the project, construction materials and equipment, trucks, and parked vehicles will be visible in the laydown area. See **Visual Resources Figure 1**.

During the construction period (including the laydown area), views of tall cranes and other heavy equipment, building materials, piles of debris, and parked cars are expected. Those views would be obstructed by existing industrial structures, sound walls bordering the nearby residential development, surrounding agriculture fields and the existing APP facilities.

Linears

The electrical transmission routes for the project would include two 115-kV transmission line corridors proposed to leave the A2PP switchyard and connecting to the proposed Grayson Substation located approximately 3300 feet southwest of the A2PP project site on East Grayson Road.

The natural gas pipeline, approximately 11.6 miles long and consisting of six segments, would begin at a new PG&E metering set for the A2PP to be located along the south fence line of the existing Almond Power Plant and end on the northwest side of A2PP. In all alignments, the gas line would go from the meter set to the gas compressors at See **Visual Resources Figure 1**.

Conclusion

Overall, staff concludes that the construction activities would create a temporary visual disturbance but no long-term impacts would occur as a result of the transmission line and gas pipeline construction.

Operational Impacts

Staff evaluated all five KOPs submitted by the applicant and chose and evaluated two of the five KOPs submitted as the two most representatives of public views of the project. Staff's decision was based on its visit to the A2PP site and surrounding area. See **Visual Resources Figure 1** for the locations of those KOPs.

As a result of that visit, staff concluded that A2PP would be visible to only a few motorists on nearby roadways and obstructed from view by adjacent structures, sound walls bordering the nearby residential development and agricultural orchards and fields within the project area.

KOP 1 – Communications Line Corridor, Looking South from Crows Landing Road

This KOP represents the primarily utilitarian view motorists traveling south on Crows Landing Road would see from directly west of the project site—primarily industrial buildings and transmission poles and lines.

The most prominent building—the WinCo warehouse distribution facility—is to the left, enclosed by a chain link fence.

However, the area is dominated by transmission lines. Wooden poles and transmission lines flanks the right side of Crows Landing Road; and a 230 kV transmission line supported by steel poles crosses the road.

Visual Sensitivity

KOP1 (**Visual Resources Figure 2**) represents the existing view, a view of moderately low visual quality. This view, which already includes telephone poles and lines and transmission poles and lines with orchards, row crops, and pastures, on both sides of Crows Landing Road, will be seen primarily by daily commuters and local residents traveling south on Crows Landing Road.

In this KOP the Almond I plant is nearly imperceptible and the horizontal and vertical lines of the telephone poles and transmission poles dominate and are the most visible objects in this KOP. The transmission lines have lined the highway since 1995, when Almond I power plant began operating, and the telephone poles has existed even longer. Consequently, viewer concern is moderately low and visibility is low.

According to the California Department of Transportation, 1,200 motorists use this road during peak traffic hours. Consequently, the number of viewers seeing this site during peak travel times is moderately low. However, the duration of their view of the transmission line corridor is moderately high, and of the existing Almond I power plant, low. As a result, the level of viewer exposure at this KOP is moderately low.

Visual Change

VISUAL RESOURCES Figure 3 is a visual simulation of the proposed Almond II project as well as the telephone poles and lines; previously existing transmission poles and lines; and added transmission poles and lines along the east side of Crows Landing Road.

The most visible components of the new Almond II project are the nine new transmission poles and lines lining the east side of Crows Landing Road and then veering further east in the Figure 3's foreground.

The contrast resulting for the introduction of the new transmission poles to Crows Landing Road is low. View blockage is low. And visual change resulting from the introduction of these nine new transmission poles and lines is low.

From this KOP visual sensitivity is moderately low; visual change is low. Those two ratings result in an impact of not significant.

KOP 2 - St. Stanislaus Golf Course Looking Northeast to Almond 2 Power Plant

Visual Resources Figure 4 represents a view seen in late fall through early spring months.

Both figures represent the same view: looking northeast from the parking lot of the St. Stanislaus Golf Course. This par-3, public, nine-hole course is located at the intersection of Crows Landing Road and West Grayson Road, approximately three-quarters of a mile southwest of the project site.

In **Visual Resources Figure 4** the agricultural field in the foreground is fallow and golfers can see the existing Almond I Power Plant in the middleground and the top of the WinCo warehouse to the left.

Visual Sensitivity

KOP 2 represents a view of moderately low visual quality as seen by recreational golfers from the golf course parking lot. Golfers are generally sensitive to their surroundings. And depending on their location on the course and the activity in which they are engaged, their concern could range from low to moderate.

From this KOP visibility is moderately low depending on the golfer's position on the course and the time of year. For example, from late fall through early spring, visibility is moderately low due to the golfer's distance from the plant and the row of trees that provides a buffer between the viewer and the plant.

Because of the size of the golf course, the number of viewers would be moderately low. The duration of view from the golf course could range low to moderate to low, depending on the golfers' place on the course to the time of year.

From this KOP viewer exposure is low and viewer sensitivity, low.

Visual Change

Visual Resources Figure 5 is a visual simulation of the proposed project's new structures, including three 80-foot exhaust stacks and the 230-kV transmission poles and lines as part of two new transmission corridors. In addition, Figure 5 includes elements existing in the viewshed before Almond II was added to the site: Almond I and the WinCo distribution warehouse.

Figure 5 represents the view seen from late fall through early spring. In late spring through early fall, corn stalks block the view of Almond I, Almond II, the WinCo warehouse, and much of the 230kV transmission poles.

From this KOP approximately ten 230 kV transmission poles and lines are introduced into the viewshed as well as three 80 foot exhaust stacks. Those elements introduce new forms, lines, and colors into the viewshed. Those new forms, lines, and colors will be noticeable during the period of time the field is fallow.

The degree of contrast is moderate. The new vertical transmission poles contrast with the horizontal lines of the WinCo distribution warehouse. And because of the foreground position of the poles in this KOP as well as their line and color, they contrast with and help minimize other elements on the horizon, including the stacks of both Almond I and Almond II.

View blockage from this KOP is low. From this KOP the Almond II blends into this highly industrial view with telephone poles and transmission towers as well as the existing Almond I. In addition, Almond II does not add sufficient mass and form to block views. From this KOP visual change is low; visual sensitivity is low. Those two ratings result in a visual impact of not significant.

Considering the moderately low visual sensitivity for recreationists, and the moderately low visual change that would be perceived at KOP 2, the project would cause a less than significant adverse visual impact.

Linears

The electrical transmission routes for the project would include two 115-kV transmission line corridors proposed to leave the A2PP switchyard and connecting to the proposed Grayson Substation located approximately 3,300 feet southwest of the A2PP project site on East Grayson Road. **See Visual Resources Figure 1**.[2]

The two 115-kV transmission lines will be carried by tubular steel angle structures or wood or steel tangent structures approximately 70 to 80 feet tall. The steel structures will be made of weathering steel, which will eventually appear brown in color similar to wood poles.

Other linears include an 11.6-mile underground natural gas pipeline, consisting of six segments, between 8 and 16 inches in diameter. The pipeline, which would be buried underground, would begin at a new PG&E metering set for the A2PP located along the south fence line of the existing Almond Power Plant and be installed on the northwest side of the A2PP.

The construction activities would create a temporary visual disturbance but no long-term impacts would occur as a result of the transmission line and gas pipeline.

Visible Water Vapor Plumes

The A2PP would use simple-cycle LM6000PG turbines with SPRINT (spray intercooling) natural gas-fired combustion turbine that would produce hot exhaust gas (790 to 850 degrees Fahrenheit). Given the high exhaust temperature vapor water plumes are expected to occur infrequently, well below 20% of seasonal daylight hours. Therefore, the visual impact analysis of the expected plume sizes would not be significant.

D. Light or Glare

"Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?"

The site of the proposed A2PP already contains the existing Almond Power Plant. Staff has observed that the existing Almond Power Plant has bright nighttime illumination.

[2] Staff notes that in *the Hughson-Grayson Transmission Line and Substation Project Newsletter,* Issue 3, April 2010, that the Turlock Irrigation District is now proposing a new route that would locate the majority of the 115-kV transmission line route on TID canals. See http://www.tid.org/Power/CurrentProjects/Hughson-GraysonProject/index.htm

However, additional lighting will be required during construction of the A2PP as well as for normal operation, emergency conditions, and for manual operations during power outages.

To minimize to the greatest extent possible the impacts of construction and operational lighting on the surrounding areas, staff proposes two conditions of certification: Condition of Certification **VIS-1** for construction lighting and Condition of Certification **VIS-2** for permanent exterior lighting.

Staff notes that the applicant indicates that to the extent feasible and consistent with worker safety codes during construction (1) task-lighting will be used to the extent practical; and (2) any lighting required for night construction activities will be directed toward the center of the construction site and shielded to prevent light from straying offsite. Those elements have been incorporated to Condition of Certification **VIS-1** and Condition of Certification **VIS-2**.

To minimize both daytime and nighttime glare, staff is proposing Condition of Certification **VIS-3,** which is designed to help minimize both daytime and nighttime glare by requiring that: (1) project structures be treated with nonreflective finishes; and (2) transmission line conductors be nonspecular and nonreflective.

Conclusion

In this visual analysis, staff focused on two primary questions: (1) Would construction and operation of A2PP result in an aesthetic impact according to CEQA; and (2) Would the project comply with applicable laws, ordinances, regulations, and statues pertaining to aesthetics or preservation and protection of sensitive visual resources.

Staff concludes that with all three proposed conditions of certification, potential project-specific visual impacts of the A2PP could be mitigated to acceptable, less-than-significant levels. With the implementation of Conditions of Certification **VIS-1**, **VIS-2,** and **VIS-3**, the A2PP would not:

1. Degrade the existing visual character or quality of the resource or the site and its surroundings.
2. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts occur when more than one project exists or is planned to be completed or constructed in the same area at the same time. That is, any one project may not create a significant visual impact; but the combination of the new project with all existing or planned projects in the area may result in a significant cumulative impact. She Title 13, California Code of Regulations, Section 15355, California Environmental Quality Act.

When conducting a visual analysis, staff must assess cumulative impacts. A finding of a significant cumulative impact would depend on the degree to which (1) the view shed is altered; (2) view of a scenic resource is impaired; or (3) visual quality is diminished.

The Turlock Irrigation District (TID), the special district that proposes to construct the A2PP, has also proposed to construct Hughson-Grayson 115-kV Transmission Line and Substation Project. The Final EIR for that project was released on November 5, 2009. This project is identified in the Turlock Irrigation District's Application for Certification for the A2PP as an essential element of the proposed A2PP.

Staff has analyzed the visual impacts of the proposed 115-kV transmission line as part of its visual analysis and has determined that this project would not result in a cumulative visual impacts requiring mitigation.

COMPLIANCE WITH LORS

As a California special district, the Turlock Irrigation District (TID) may override local land use controls. However, in its Application for Certification to the California Energy Commission, the district indicated its desire to comply with applicable local laws, ordinances, regulations, and standards (LORS).

Information about applicable LORS and the applicant's compliance with those laws may be found in Visual Resources Table 2, which follows.

VISUAL RESOURCES Table 2
Laws, Ordinances, Regulations, and Standards (LORS)

Source	Descriptions
Federal	
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (PL 109-59;2005). Expires 2009	A2PP is not located within or in the vicinity of federally-managed lands or in the vicinity of a recognized National Scenic Byway or All-American Road.
State	
California Streets and Highways Code, Section 260 through 263 – Scenic Highways	Ensures the protection of highway corridors that reflect the state's natural scenic beauty. The state of California has not formally designated as scenic any of the roads or highways within or adjacent to the project area.

Local	
City of Ceres 2015 General Plan Section: Major Corridors Policy 1.J.6 Section: Industrial Development Policy 1.G.4 Policy 1.G.5	A long term vision of Ceres which outlines policies, standards, and programs to guide day to day decisions concerning development through 2015. To enhance the visual quality of its major corridors by requiring new and expanding development to conceal unsightly uses and equipment, (i.e., screening of rooftop equipment and outdoor storage and undergrounding of utilities). ***Complies**. Project is not readily visible from the closest major corridor within city limits.* City shall seek to minimize the adverse visual impacts of industrial development from State Route 99, primarily through landscaping and fences. ***Complies:** Project will not be visible from Highway 99.* City shall encourage industrial developments that include the following features: -Attractive building frontages that are readily visible for the public street (brick, wood façade). -Variation in the roofline (multi-planed, pitched roofs) -Articulation in the walls (insets, projections, canopies, wing walls, trellis) -Large parking areas with tree coverage separated into a series of smaller parking areas with the use of landscaping and the location of buildings. -Outdoor service areas, loading bays and outdoor storage areas that are not readily visible to the public. -Attractive landscaping to enhance the business by softening buildings and parking areas ***Complies:** Project is landscaped at entrance and most project features are not in public view.*
City of Ceres Municipal Code Land Use and Development Standards: J2: Landscaping G: Building Height Requirements	Provides conceptual framework for the installation of public facilities, provision of public services, and future development. All uses shall provide landscaping that shall be maintained. **Complies.** No new landscaping proposed for A2PP. However, A2PP to share entrance with Almond Power Plant and entrance is landscaped. Height of all main and accessory buildings erected in M-2 zone shall be as approved by Planning Commission. **Complies:** Height of A2PP stacks is 80 feet; existing Almond Power Plant stack is 92 feet. Project is located in area zoned industrial.
Stanislaus County 2020 General Plan, Land Use Conservation/Open Space Element: Goal 1	To ensure the continued success of the area's leading agricultural industry. Encourage the protection and preservation of natural and scenic areas throughout the county. **Complies**. Project not located in area considered natural or scenic.

PROPOSED CONDITIONS OF CERTIFICATION

CONSTRUCTION LIGHTING

VIS-1 The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

A. All lighting shall be of minimum necessary brightness consistent with worker safety and security

B. All fixed position lighting shall be shielded/hooded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and direct light trespass (direct light extending outside the boundaries of the power plant site or the site of construction of ancillary facilities, including any security related boundaries)

C. Low pressure sodium vapor lighting or overhead high pressure sodium vapor lighting with shields or cutoff luminaries shall be utilized

D. Wherever feasible, safe and not needed for security, lighting shall be kept off when not in use

E. If the project owner receives a complaint concerning adverse lighting impacts, the project owner shall notify CPM by providing a copy of the Compliance Plan General Conditions Complaint Resolution Form to document the complaint and resolution. All records of lighting complaints shall be kept in the on-site compliance file.

Verification: Within seven days after the first use of construction lighting, the project owner shall notify and the CPM that the lighting is ready for inspection. If the CPM requires modifications to the lighting, 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.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the General Conditions section including a proposal to resolve the complaint, and a schedule for implementation. The project owner shall notify the CPM within 48 hours after completing implementation of the proposal. A copy of the complaint resolution form report shall be included in the subsequent Monthly Compliance Report following complaint resolution.

PERMANENT EXTERIOR LIGHTING

VIS-2 To the extent feasible, consistent with safety and security considerations, the project owner shall design and install all permanent exterior lighting such that (a) lamps and reflectors are not visible from beyond the project site, including any off0site security buffer areas; (b) lighting does not cause excess reflected glare; (c) direct lighting does not illuminate the nighttime sky; (d) illumination of the project and its immediate vicinity is minimized; and (e) the plan complies with local policies and ordinances.

The project owner shall submit to the CPM for review and approval and simultaneously to the city of Ceres and county of Stanislaus community development departments for review and comment a lighting mitigation plan that includes the following:

a. Location and direction of light fixtures shall take the lighting mitigation requirements into account

b. Lighting design shall consider setbacks of project features from the site boundary to aid in satisfying the lighting obligation requirements

c. Lighting shall incorporate fixture hoods/shielding, with light directed downward or toward the area to be illuminated.

d. Low pressure

e. Light fixtures that are visible from beyond the project boundary shall have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security.

f. All lighting shall be of minimum necessary brightness consistent with operational safety and security.

g. Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have in addition to hoods, switches, t\; timer switches; or motion detectors so that the lights operate only when the area is occupied.

Verification: At least 90 days prior to ordering any permanent exterior lighting, the project owner shall contact the CPM to discuss the documentation required in the lighting mitigation plan.

At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and approval and simultaneously to the city of Ceres and country of Stanislaus community development departments for review and comment a lighting mitigation plan.

Prior to commercial operation, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If after inspection the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification, the project owner shall implement the modifications and notify the CPM that the modifications have been completed and are ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the Compliance General Conditions, including a proposal to resolve the complaint and a schedule for implementation

SURFACE TREATMENT OF PROJECT STRUCTURES AND BUILDINGS

VIS-3 The project owner shall treat the surfaces of all project structures and buildings visible to the public such that a) their color(s) minimize(s) visual intrusion and contrast by blending with the landscape; b) their colors and finishes do not

create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive.

The project owner shall submit to the city of Ceres Planning Department and Stanislaus County Planning Department for review and comment and to the CPM for review and approval, a specific surface treatment plan that will satisfy these requirements. The treatment plan shall include:

a. Description of the overall rationale for the proposed surface treatment, including the selection of the proposed colors and finishes
b. List of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the colors and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system
c. One set of color brochures or color chips showing each proposed color and finish
d. One set of 11” x 17” color photo simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture, from Key Observation Points 1 and 2 (locations indicated on Visual Resources Figure 1),
e. Specific schedule for completion of the treatment
f. Procedure to ensure proper treatment maintenance for 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 in the field, until the project owner receives comment from the city of Ceres Planning Department and notification of approval of the treatment plan by the CPM. Subsequent modifications to the treatment plan are prohibited without CPM approval.

Verification: At least 90 days prior to the start of commercial operation, the project owner shall submit the specific surface treatment plan to the city of Ceres Planning Department and Stanislaus County for review and comment and to the CPM for review and approval. The project owner shall allow the city and county 45 days to respond to their submittal. The project owner shall provide a copy of city and county submittal and city comments to the CPM within 60 days of the start of construction. If the CPM notifies the project owner that any revisions of the surface restoration plan are needed, the project owner shall submit to the CPM a plan with the specified revisions within 30 days of receiving that notification.

The project owner shall complete surface restoration within 60 days after the start of commercial operation. The project owner shall notify the CPM within seven days after completion of surface restoration that the restoration is ready for inspection.

Within 90 days after the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed

and they are ready for inspection, and shall submit one set of electronic color photographs from the same KOP location identified in above.
The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify a): the condition of the surfaces of all structures and buildings at the end of the reporting year; and b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

REFERENCES

AFC 2009 - *TID Almond 2 Power Plant Application for Certification* Volume I & II, Submitted to CEC/Docket Unit Dated May 11, 2009

AFC 2009 - TID A2PP Data Response Set 1D; November 2009

AFC 2009 – TID A2PP Query Set 2 D; October 22, 2009

AFC 2009 - TID A2PP Supplemental A; June 9, 2009

CH2MHill Data Responses. Submitted to CEC/Docket Unit; date

California *Fire Code*, 2007, Title 24, Part 9

City of Ceres *2015 General Plan*

City of Ceres *Municipal Zoning Code*; Title 18

County of Stanislaus *2020 General Plan*

County of Stanislaus *Municipal Zoning Code*, Title 21

Hughson-Grayson 115-kV Transmission Line and Substation Project, Draft Environmental Impact Report dated August 10, 2009

Hughson-Grayson Newsletter, Issue 3; April 2010

Service Road Industrial Master Plan, January 1996; Amended June 28, 1999

Special Districts: Relics of the Past or Resources for the Future; California Little Hoover Commission; May 3, 2000

What's So Special About Special Districts? A Citizens' Guide To Special Districts in California*, Third Edition;* Kimia Mizany and April Manatt, February 2002

APPENDIX VR-1: STAFF'S VISUAL RESOURCES EVALUATION METHODOLOGY

Staff evaluates the visual characteristics of the existing physical setting, the proposed project, the circumstances affecting the viewer, and the degree of visual change that a proposed project may introduce using the identified elements, and generally accepted criteria for determining substantial environmental impact significance identified below.

ELEMENTS OF THE METHODOLOGY

Key Observation Points

Staff evaluates the existing visible physical environmental setting from a fixed vantage point (called a "Key Observation Point" [KOP]), and the visual change introduced by the proposed project to the view from that KOP. The view as seen from the KOP is referred to as the viewshed. Staff uses a KOP[3] to represent a location(s) from which to conduct detailed analyses of the proposed project and to obtain existing condition photographs and prepare photo simulations. KOPs are selected to be representative of the most critical viewshed locations from which the project would be seen. Because it is not feasible to analyze all the views in which a proposed project would be seen, it is necessary to select a KOP that would most clearly display the visual effects of the proposed project. A KOP may also represent a primary viewer groups that would potentially be affected by the project. In addition to KOP photo(s), staff reviews landscape character photos that help provide a visual overview of a project site, its vicinity, and the selected KOP area, as appropriate. Prior to application submittal, staff participates in the selection of appropriate KOP(s) for the analysis.

LORS Consistency

Energy Commission staff consider federal, state, and local laws, ordinances, regulations, and standards (LORS) relevant to aesthetics, or protection and preservation of visual sensitive resources. Conflicts with such LORS can constitute significant visual impacts. For example visual staff examines land use planning documents, such as a local government's General Plan, Specific Plan, and zoning ordinances applicable to the project site and surrounding area to gain insight as to the type of land uses intended for the area, and the guidelines given for aesthetics, or protection and preservation of visual sensitive resources.

Distance Zones

Distance zones are divisions of a particular landscape being viewed. There are three distance zones: foreground, middleground, and background.

Foreground view is based upon distances at which details can be perceived. It is usually limited to an area within ¼ to ½ mile of the observer;

[3]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.

Middleground view is based upon distances where texture normally is characterized by the masses of trees in stands of uniform tree cover. This zone usually extends to 3 to 5 miles from the observer;

Background view is based on distances where texture in stands of uniform tree cover is generally very weak or non-existent.

APPENDIX VR-2

ENERGY COMMISSION STAFF - VISUAL ANALYSIS TERMS

For the purpose of this visual analysis, Energy Commission staff has defined the following visual related terms:

Duration of View - ranges from high (extended) a view of the project site that is reached across a stretched out distance, or amount of time; to, low (brief) a view of the project site that is reached in a short amount of distance or time. The range of view duration generally differs depending on the type of activity in which the viewers is engaged.

Scenic Resource - a unique water feature (waterfall, transitional water, part of a stream or river, estuary); a unique physical geological terrain feature (rock masses, outcroppings, layers or spires); a tree having a unique visual/historical importance to a community (a tree linked to a famous event or person, an ancient old growth tree); historic building; or a designated federal scenic byway or state scenic highway corridor.

Scenic Vista - a distant view through and along a corridor or opening that exhibits a high degree of pictorial quality.

Viewer Concern - estimated level of a viewer's anticipated interest in preserving and protecting the existing physical environment. Viewer attitudes and expectations is often correlated with viewer activity type (e.g., viewers engaged in certain activities, such as recreation, are considered to have high levels of concern for scenic quality, while those engaged in other activities, such as work, are generally considered to have lower levels of concern). Residences are generally considered to have high viewer concern.

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, including business parks, 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, indicate a higher level of 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 – visibility of a landscape feature, the number of viewers, distance, and the duration of the view are primary factors affecting viewer susceptibility to impacts.

Viewshed – an area visible to an observer from a fixed vantage point (Key Observation Point [KOP]). Staff uses a 35mm camera with a focal length of 50mm which encompasses an approximate image angle of 46^0 similar to the field-of-view of the human eye. The staff uses a viewshed that is not to be confused with a panoramic (180^0) or cycloramic (360^0). These are broad horizontal composition with no apparent limits to the view.

Visibility - the level the proposed project site is visually obstructed by natural and/or man-made surface features (development, vegetation, hills) from the Key Observation Point.

Visual Contrast - The conspicuousness or prominence of a project, and its compatibility with its setting. Contrast is described in terms of formal attributes of form, line, color, and texture of the project in comparison to those of the setting. Consider the proposed project's introduction of **form** (shape and mass), **line** (changes in edge types and interruption or introduction of edges, bands and silhouette lines), **color** (surface color, reflectivity, and glare), and **texture** (noticeable differences in the grain, or irregularity and directional patterns) to the existing physical environment to determine the degree of contrast**.** Degree of contrast: None – the element contrast is not visible or perceived; Weak – the element contrast can be seen but does not attract attention; Moderate – the element contrast begins to attract attention and begins to dominate the characteristic landscape; Strong – the element contrast demands attention, will not be overlooked, and is dominant in the landscape.

Visual Disruption - the extent to which a previously visible scenic resource or scenic vista in the existing physical environment is blocked from view by the proposed project. The view disruption is assigned greater weight according to the quality and importance of the block view.

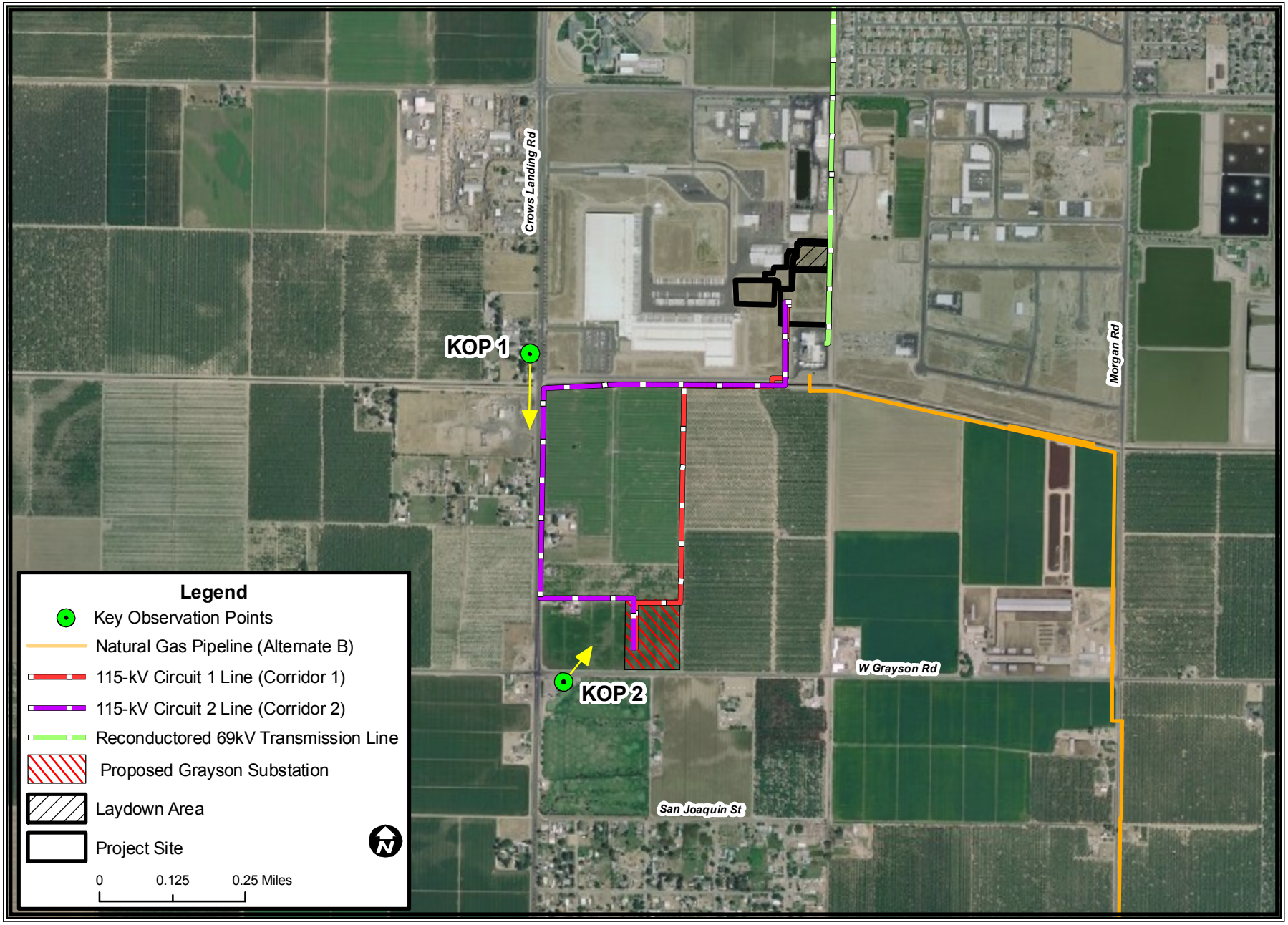
Visual Quality – the estimated visual impression and appeal of the existing physical environmental setting and the associated public value attributed to it. An outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as "picture postcard" landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations, and do not provide views that people would find inviting or interesting (Buhyoff et al., 1994).

Visual Scale - the proposed project's apparent size relationship with other components in the existing physical environment relative to the total field-of-view as viewed by the human eye, or the lens of a 35mm camera with a focal length of 50mm.

Visual Sensitivity - the overall level of sensitivity of a viewshed due to visual change is a function of visual quality, viewer concern, and viewer exposure.

VISUAL RESOURCES- FIGURE 1

Almond 2 Power Plant Project - KOP Photo Locations



VISUAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI Imagery - CH2MHill - California Energy Commission

VISUAL RESOURCES - FIGURE 2

Almond 2 Power Plant Project - KOP 1 - Communication Lines Corridor, Looking South from Crows Landing Road

VISUAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Data Response Set 1a - SQ-1a

VISUAL RESOURCES - FIGURE 3

Almond 2 Power Plant Project - KOP 1 - Simulated View - Communication Lines Corridor, Looking South from Crows Landing Road

VISUAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE:Data Response Set 1a - SQ-1a

VISUAL RESOURCES - FIGURE 4

Almond 2 Power Plant Project - KOP 2 - Existing View - View from St. Stanislaus Golf Course, Late Fall Through Early Spring, Looking Southwest to Almond 2 Power Plant

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Data Response Set 1a - SQ-1b

VISUAL RESOURCES - FIGURE 5

Almond 2 Power Plant Project - KOP 2 - Simulated View - View from St. Stanislaus Golf Course, Late Fall Through Early Spring, Looking Southwest to Almond 2 Power Plant

VISUAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Data Response Set 1a - SQ-1b

WASTE MANAGEMENT

Testimony of Ellie Townsend-Hough

SUMMARY OF CONCLUSIONS

Management of the waste generated during construction and operation of the Turlock Irrigation District (TID) Almond 2 Power Plant (A2PP) would not result in any significant adverse impacts, and would comply with applicable waste management laws, ordinances, regulations, and standards, if the measures proposed in the Application for Certification (AFC) and staff's proposed conditions of certification are implemented.

INTRODUCTION

This Staff Assessment (SA) presents an analysis of issues associated with wastes generated from the proposed construction and operation of the A2PP. The technical scope of this analysis encompasses solid wastes existing onsite and those to be generated during facility construction and operation. Management and discharge of wastewater is addressed in the **Soil and Water Resources** section of this document. Additional information related to waste management may also be covered in the **Worker Safety** and **Hazardous Materials Management** sections of this document.

The Energy Commission staff's objectives in conducting this waste management analysis are to ensure that:

- The management of project wastes would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during the construction and operation of the proposed project would be managed in an environmentally safe manner.
- The disposal of project wastes would not result in significant adverse impacts to existing waste disposal facilities.
- Upon project completion, the site is managed in such a way that project wastes and waste constituents would not pose a significant risk to humans or the environment.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local environmental laws, ordinances, regulations and standards (LORS) have been established to ensure the safe and proper management of both solid and hazardous wastes in order to protect human health and the environment. Project compliance with the various LORS is a major component of staff's determination regarding the significance and acceptability of the A2PP with respect to management of waste.

WASTE MANAGEMENT Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Title 42, United States Code (U.S.C.), §§6901, et seq. Solid Waste Disposal Act of 1965 (as amended and revised by the Resource Conservation and Recovery Act of 1976, et al).	The Solid Waste Disposal Act, as amended and revised by the Resource Conservation and Recovery Act (RCRA) et al, establishes requirements for the management of solid wastes (including hazardous wastes), landfills, underground storage tanks, and certain medical wastes. The statute also addresses program administration, implementation and delegation to states, enforcement provisions and responsibilities, as well as research, training, and grant funding provisions. RCRA Subtitle C establishes provisions for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing: • Generator record keeping practices that identify quantities of hazardous wastes generated and their disposition; • Waste labeling practices and use of appropriate containers; • Use of a manifest when transporting wastes; • Submission of periodic reports to the United States Environmental Protection Agency (USEPA) or other authorized agency; and • Corrective action to remediate releases of hazardous waste and contamination associated with RCRA-regulated facilities. RCRA Subtitle D establishes provisions for the design and operation of solid waste landfills. RCRA is administered at the federal level by USEPA and its ten regional offices. The Pacific Southwest regional office (Region 9) implements USEPA programs in California, Nevada, Arizona, and Hawaii.
Title 42, U.S.C., §§ 9601, et seq. Comprehensive Environmental Response, Compensation and Liability Act	The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund, establishes authority and funding mechanisms for cleanup of uncontrolled or abandoned hazardous waste sites, as well as cleanup of accidents, spills, or emergency releases of pollutants and contaminants into the environment. Among other things, the statute addresses: • Reporting requirements for releases of hazardous substances; • Requirements for remedial action at closed or abandoned hazardous waste sites, and brownfields; • Liability of persons responsible for releases of hazardous substances or waste; and • Requirements for property owners/potential buyers to conduct “all appropriate inquiries” into previous ownership and uses of the property to 1) determine if hazardous substances have been or may have been released at the site, and 2) establish that the owner/buyer did not cause or contribute to the release. A Phase I Environmental Site Assessment is commonly used to satisfy CERCLA “all appropriate inquiries” requirements.
Title 40, Code of Federal Regulations (CFR), Subchapter I – Solid Wastes.	These regulations were established by USEPA to implement the provisions of the Solid Waste Disposal Act and RCRA (described above). Among other things, the regulations establish the criteria for classification of solid waste disposal facilities (landfills), hazardous waste characteristic criteria and regulatory thresholds, hazardous waste generator requirements, and requirements for management of used oil and universal wastes. • Part 246 addresses source separation for materials recovery guidelines. • Part 257 addresses the criteria for classification of solid waste disposal facilities and practices. • Part 258 addresses the criteria for municipal solid waste landfills. • Parts 260 through 279 address management of hazardous wastes, used oil, and universal wastes (i.e., batteries, mercury-containing equipment, and lamps).

	USEPA implements the regulations at the federal level. However, California is an authorized state so the regulations are implemented by state agencies and authorized local agencies in lieu of USEPA.
Title 49, CFR, Parts 172 and 173. Hazardous Materials Regulations	U.S. Department of Transportation established standards for transport of hazardous materials and hazardous wastes. The standards include requirements for labeling, packaging, and shipping of hazardous materials and hazardous wastes, as well as training requirements for personnel completing shipping papers and manifests. Section 172.205 specifically addresses use and preparation of hazardous waste manifests in accordance with Title 40, CFR, section 262.20.
State	
California Health and Safety Code (HSC), Chapter 6.5, §25100, et seq. Hazardous Waste Control Act of 1972, as amended.	This California law creates the framework under which hazardous wastes must be managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA program. It also provides for the designation of California-only hazardous wastes and development of standards (regulations) that are equal to or, in some cases, more stringent than federal requirements. The California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) administers and implements the provisions of the law at the state level. Certified Unified Program Agencies (CUPAs) implement some elements of the law at the local level.
Title 22, California Code of Regulations (CCR), Division 4.5. Environmental Health Standards for the Management of Hazardous Waste	These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with the federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Generator standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters. The standards addressed by Title 22, CFR include: • Identification and Listing of Hazardous Waste (Chapter 11, §§66261.1, et seq.) • Standards Applicable to Generators of Hazardous Waste (Chapter 12, §§66262.10, et seq.) • Standards Applicable to Transporters of Hazardous Waste (Chapter 13, §§66263.10, et seq.) • Standards for Universal Waste Management (Chapter 23, §§66273.1, et seq.) • Standards for the Management of Used Oil (Chapter 29, §§66279.1, et seq.) • Requirements for Units and Facilities Deemed to Have a Permit by Rule (Chapter 45, §§67450.1, et seq.) The Title 22 regulations are established and enforced at the state level by DTSC. Some generator standards are also enforced at the local level by CUPAs.
HSC, Chapter 6.11 §§25404 – 25404.9 Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)	The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the six environmental and emergency response programs listed below. • Aboveground Storage Tank Program • Business Plan Program • California Accidental Release Prevention (CalARP) Program • Hazardous Material Management Plan / Hazardous Material Inventory Statement Program • Hazardous Waste Generator / Tiered Permitting Program • Underground Storage Tank Program The state agencies responsible for these programs set the standards for their

	programs while local governments implement the standards. The local agencies implementing the Unified Program are known as Certified Unified Program Agencies (CUPAs). San Diego County Department of Environmental Health is the area CUPA. Note: The Waste Management analysis only considers application of the Hazardous Waste Generator/Tiered Permitting element of the Unified Program. Other elements of the Unified Program may be addressed in the Hazardous Materials and/or Worker Health and Safety analysis sections.
Title 27, CCR, Division 1, Subdivision 4, Chapter 1, §15100, et seq. Unified Hazardous Waste and Hazardous Materials Management Regulatory Program	While these regulations primarily address certification and implementation of the program by the local CUPAs, the regulations do contain specific reporting requirements for businesses. • Article 9 – Unified Program Standardized Forms and Formats (§§ 15400-15410). • Article 10 – Business Reporting to CUPAs (§§15600 – 15620).
Public Resources Code, Division 30, §40000, et seq. California Integrated Waste Management Act of 1989.	The California Integrated Waste Management Act of 1989 (as amended) establishes mandates and standards for management of solid waste. Among other things, the law includes provisions addressing solid waste source reduction and recycling, standards for design and construction of municipal landfills, and programs for county waste management plans and local implementation of solid waste requirements.
Title 14, CCR, Division 7, §17200, et seq. California Integrated Waste Management Board	These regulations further implement the provisions of the California Integrated Waste Management Act and set forth minimum standards for solid waste handling and disposal. The regulations include standards for solid waste management, as well as enforcement and program administration provisions. • Chapter 3 -- Minimum Standards for Solid Waste Handling and Disposal. • Chapter 3.5 – Standards for Handling and Disposal of Asbestos Containing Waste. • Chapter 7 – Special Waste Standards. • Chapter 8 – Used Oil Recycling Program. • Chapter 8.2 – Electronic Waste Recovery and Recycling
HSC, Division 20, Chapter 6.5, Article 11.9, §25244.12, et seq. Hazardous Waste Source Reduction and Management Review Act of 1989 (also known as SB 14).	This law was enacted to expand the State's hazardous waste source reduction activities. Among other things, it establishes hazardous waste source reduction review, planning, and reporting requirements for businesses that routinely generate more than 12,000 kilograms (~ 26,400 pounds) of hazardous waste in a designated reporting year. The review and planning elements are required to be done on a 4 year cycle, with a summary progress report due to DTSC every 4th year.
Title 22, CCR, §67100.1 et seq. Hazardous Waste Source Reduction and Management Review.	These regulations further clarify and implement the provisions of the Hazardous Waste Source Reduction and Management Review Act of 1989 (noted above). The regulations establish the specific review elements and reporting requirements to be completed by generators subject to the Act.
Local	
Stanislaus County Code Title 9 – Health & Safety Code	Stanislaus County Environmental Resources Department administers a comprehensive environmental protection program. Provides guidance for remediation of contaminated sites and for siting and management of facilities that store, collect, treat, dispose or transfer of solid and hazardous waste.

SETTING

PROPOSED PROJECT

The proposed A2PP is a 174 Megawatt (MW) natural gas-fired, simple cycle peaking generating facility. The simple cycle equipment will consist of three General Electric LM6000 combustion turbine generators, and associated support equipment. The facility will be located on a 4.6-acre parcel at 4500 Crows Landing Road, Modesto, California in Stanislaus County California. The Stanislaus County Assessor's Parcel Number is 041-060-039(TID2009a, page 5.14).

An 11.6-mile underground gas pipeline will be constructed, owned and operated by the Pacific Gas & Electric Company (PG&E) to convey natural gas to A2PP from the existing gas transmission Line #215 . Also, PG&E will reinforce a 1.8-mile long segment of Line #215. The 11.6-mile long gas line runs south of the project along paved roads and unpaved farm roads. The reinforced segment is located along the western side of the San Joaquin River (CH2MHILL2009k, Data Response 77).

The proposed A2PP would be a peaking power plant and would operate during times of very high electrical load, when baseload plants are not operating, or during emergency conditions. The construction associated with A2PP will produce a variety of mixed nonhazardous wastes, such as scrap wood, metal, plastics, etc. Operation and maintenance of the plant and associated facilities will generate a variety of wastes, including hazardous wastes. Wastes will be recycled where practical and nonrecyclable wastes will be deposited in a Class III landfill. The hazardous wastes generated will consist of electrical equipment, used oils, universal wastes, solvents, and empty hazardous waste materials (TID2009a, Section 5.14). Universal wastes are hazardous wastes that contain mercury, lead, cadmium, copper and other substances hazardous to human and environmental health. Examples of universal wastes are batteries, fluorescent tubes, and some electronic devices.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

This Waste Management analysis addresses: a) existing project site conditions and the potential for contamination associated with prior activities on or near the project site, and b) the impacts from the generation and management of wastes during project construction and operation.

a) For any site in California proposed for the construction of a power plant, the applicant must provide documentation about the nature of any potential or existing releases of hazardous substances or contamination at the site. If potential or existing releases or contamination at the site are identified, the significance of the release or contamination would be determined by site-specific factors, including, but not limited to: the amount and concentration of contaminants or contamination; the proposed use of the area where the contaminants/contamination is found; and any potential pathways for workers, the public, or sensitive species or environmental areas to be exposed to the contaminants. Any unmitigated contamination or releases of

hazardous substances that pose a risk to human health or environmental receptors would be considered significant by Energy Commission staff.

As a first step in documenting existing site conditions, the Energy Commission's power plant site certification regulations require that a Phase I Environmental Site Assessment (ESA) be prepared[1] and submitted as part of an application for certification. The Phase I ESA is conducted to identify any conditions indicative of releases and threatened releases of hazardous substances at the site and to identify any areas known to be contaminated (or a source of contamination) or near the site.

In general, the Phase I ESA uses a qualified Environmental Professional (EP) to conduct inquiries into past uses and ownership of the property, research hazardous substance releases and hazardous waste disposal at the site and within a certain distance of the site, and visually inspect the property, making observations about the potential for contamination and possible areas of concern. After conducting all necessary file reviews, interviews, and site observations, the EP then provides findings about the environmental conditions at the site. In addition, since the Phase I ESA does not include sampling or testing, the EP may also give an opinion about the potential need for any additional investigation. Additional investigation may be needed, for example, if there were significant gaps in the information available about the site, an ongoing release is suspected, or to confirm an existing environmental condition.

If additional investigation is needed to identify the extent of possible contamination, a Phase II ESA may be required. The Phase II ESA usually includes sampling and testing of potentially contaminated media to verify the level of contamination and the potential for remediation at the site.

In conducting its assessment of a proposed project, Energy Commission staff will review the project's Phase I ESA and work with the appropriate oversight agencies as necessary to determine if additional site characterization work is needed and if any mitigation is necessary at the site to ensure protection of human health and the environment from any hazardous substance releases or contamination identified.

b) Regarding the management of project-related wastes generated during construction and operation of the proposed project, staff reviews the applicant's proposed solid and hazardous waste management methods and determines if the methods proposed are consistent with the LORS identified for waste disposal and recycling. The federal, state, and local LORS represent a comprehensive regulatory system designed to protect human health and the environment from impacts associated with management of both non-hazardous and hazardous wastes. Absent any unusual circumstances, staff considers project compliance with LORS to be sufficient to ensure that no significant impacts would occur as a result of project waste management.

[1] Title 20, California Code of Regulations, Section 1704(c) and Appendix B, section (g) (12) (A). Note that the Phase I ESA must be prepared according to American Society for Testing and Materials protocol or an equivalent method agreed upon by the applicant and the Energy Commission staff.

Staff then reviews the capacity available at off-site treatment and disposal sites and determines whether or not the proposed power plant's waste would have a significant impact on the volume of waste a facility is permitted to accept. Staff uses a waste volume threshold equal to 10% of a disposal facility's remaining permitted capacity to determine if the impact from disposal of project wastes at a particular facility would be significant.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Existing Site Conditions

The applicant provided Phase I Environmental Site Assessments (ESAs) for the project site, the proposed 11.6 natural gas line, and the 1.8-mile long reinforcement segment of PG&E gas line #215. A Phase I ESA for the proposed project site, dated February 9, 2009, was prepared by Wallace Kuhl & Associates (WKA) in accordance with the American Society for Testing and Materials Standard Practice E 1527-05 for ESAs (TID2009a, Appendix 5.14). The Phase I ESA for the pipeline was completed by CH2MHill November 2009 (CH2MHILL2009k Data Response 77).

The proposed project site is located on 4.6 undeveloped acres of land. Photographs, maps, and other historic records indicate the site has been historically part of a larger agriculture property that was used for farming from 1950 to 2004. The parcel is currently undeveloped and was used for a borrowing pit for the WinCo Food Distribution Company warehouse. The acreage consists mainly of fill. The site was excavated to 6.5 feet below grade and filled with 30,000 cubic yards of soil from agricultural land. The area is bounded to the west by a WinCo distribution facility, to the north by a Stanislaus Farm Supply, to the east by the Union Pacific Railroad line, and to the south by TID's existing Almond 1 evaporation ponds.

The Phase I ESA conducted for the proposed A2PP site did not identify recognized environmental conditions (REC) associated with the proposed project site. A REC is the presence or likely presence of any hazardous substances or petroleum products on a property under the conditions that indicated an existing release, past release, or a material threat of a release of any hazardous substance or petroleum products into structures on the property or in the ground, groundwater, or surface water of the property. The Phase I ESA identified that the groundwater in the area to the north of the site is impacted with Nitrates (TID2009a, Appendix 5.14). The ESA recommended that domestic well water be tested for nitrates and that the fill material be tested for persistent pesticide residues. Soil samples were collected and analyzed for Organochlorine Pesticides using Environmental Protection Agency (EPA) method 8081A. The samples were also analyzed for California Title 22 Heavy Metals Test CAM 17 metals, using EPA method 6010. The environmental assessment identified no organochlorine pesticide residuals in the soil samples. The CAM 17 metals analysis indicated that most of the levels of metal concentrations are low or non-detectable. Arsenic was detected in two samples at 1.4 milligrams per kilogram (mg/Kg) and 1.6 mg/Kg. Although arsenic exceeds the California Human Health Screening Level (CHHSL) value for residential and commercial exposure scenarios, the regulatory trigger level for sensitive sites of 11 mg/Kg was not exceeded (TID2009a, Appendix

5.14).[2] WKA also performed a preliminary screening for potential vapor intrusion conditions (pVIC)[3] beneath the site using a pVIC matrix. The screening concluded that there are no pVICs beneath the site.

In order to exercise due diligence to ensure there are no contaminants on the project site that would pose a health and safety risk, the California Energy Commission staff requested that TID conduct a Phase I ESA for the natural gas pipeline route. The applicant provided staff with a modified Phase II ESA for the natural gas pipeline route. The ESA included an Environmental Data Resources (EDR) database search (CH2MHill, Appendix H), historical aerial photographs and field surveys along the pipeline route. The applicant also provided a list of pesticides used and crops grown along the proposed pipeline corridor study (CH2MHILL2009k, Data Responses 77-79). In the event that construction excavation, grading or trenching activities for the gas pipeline encounter potentially contaminated soils, special handling, disposal, and or other mitigation measures would be required similar those proposed for A2PP and would be adequate to address identification and investigation of soil or groundwater contamination.

In the event that contamination is identified during any phase of construction, staff proposes Condition of Certification **WASTE-1**, which would require that an experienced and qualified Professional Engineer or Professional Geologist be available for consultation in the event contaminated soil is encountered. If contaminated soil is identified, **WASTE-2** would require that the Professional Engineer or Professional Geologist inspect the site, determine what is required to characterize the nature and extent of contamination, and provide a report to the Energy Commission Compliance Project Manager (CPM) and DTSC with findings and recommended actions.

Construction Impacts and Mitigation

Site preparation and construction of the proposed power plant and associated facilities would generate both nonhazardous and hazardous wastes in solid and liquid forms (TID2009a, Section 5.14.1.2.1). Before construction can begin, the project owner would be required to develop and implement a Construction Waste Management Plan, per proposed condition of certification **WASTE-3**.

Non-hazardous Wastes

Non-hazardous solid wastes generated during construction would include approximately 120 tons of scrap wood, concrete, steel/metal, paper, glass, and plastic waste (TID2009a, Section 5.14.2.1.1). All non-hazardous wastes would be recycled to the extent possible and non-recyclable wastes would be collected by a licensed hauler and disposed in a solid waste disposal facility, in accordance with Title 14, California Code of Regulations, §17200 et seq.

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[2] The CHHSLs were developed by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA, and contained in their report entitled “Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil”. The thresholds of concern used to develop the CHHSLs are an excess lifetime cancer risk of one-in-a-million (10^{-6}) and a hazard quotient of 1.0 for noncancerous health effects. The CHHSLs were developed using standard exposure assumptions and chemical toxicity values published by the USEPA and Cal/EPA.

[3] Vapor Intrusion Studies, as specified in the ASTM E2600-08 “Standard Practice for the Assessment of Vapor Intrusion into Structures on Property Involved in Real Estate Transaction”. This assessment determines if sources of contamination are located close enough to on-site buildings to create a pVIC. If a pVIC is found to exist, or cannot be rules out, further assessment will be warranted. (TID2009a, Appendix 5.14)

Non-hazardous liquid wastes would also be generated during construction, including sanitary wastes, dust suppression drainage, and equipment wash water. Sanitary wastes would be collected in portable, self-contained toilets and pumped periodically for disposal at an appropriate facility. Potentially contaminated equipment wash water will be contained at designated wash areas and transported to a sanitary wastewater treatment facility. Please see the **Soil and Water Resources** section of this document for more information on the management of project wastewater.

Hazardous Wastes

Hazardous wastes anticipated to be generated during construction include empty hazardous material containers, solvents, waste paint, oil absorbents, used oil, oily rags, batteries, and cleaning wastes. The amount of waste generated would be minor if handled in the manner identified in the AFC (TID2009a, Section 5.14.1.2.1).

The project owner would be required to obtain a unique hazardous waste generator identification number for the site prior to starting construction pursuant to proposed condition of certification **WASTE-4**. Although the hazardous waste generator number is determined based on site location, both the construction contractor and the project owner/operator could be considered the generator of hazardous wastes at the site. Wastes would be accumulated onsite for less than 90 days and then properly manifested, transported and disposed at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies. Staff reviewed the disposal methods described in AFC Section 5.14.1.2.1 and in the responses to data requests, and concluded that all wastes would be disposed in accordance with all applicable LORS. Should any construction waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed condition of certification **WASTE-5** to notify the Energy Commission's Compliance Project Manager (CPM) whenever the owner becomes aware of any such action.

In the event that construction excavation, grading or trenching activities for the proposed project encounter potentially contaminated soils, specific handling, disposal, and other precautions may be necessary pursuant to hazardous waste management LORS, staff finds that proposed conditions of certification **WASTE-1** and **WASTE-2** would be adequate to address any soil contamination contingency that may be encountered during construction of the project and would ensure compliance with LORS. Absent any unusual circumstances, staff considers project compliance with LORS to be sufficient to ensure that no significant impacts would occur as a result of project waste management activities.

Operation Impacts and Mitigation

The proposed A2PP would generate non-hazardous and hazardous wastes in both solid and liquid forms under normal operating conditions. (Table 5.14-2 of the project AFC gives a summary of the operation waste streams, expected waste volumes and generation frequency, and management methods proposed.) Before operations can begin, the project owner would be required to develop and implement an Operation Waste Management Plan pursuant to proposed condition of certification **WASTE-6**.

Non-hazardous Solid Wastes

Non-hazardous solid wastes expected to be generated during project operation include routine maintenance wastes (such as used air filters, spent deionization resins, sand and filter media) as well as domestic and office wastes (such as office paper, newsprint, aluminum cans, plastic, and glass). All non-hazardous wastes will be recycled to the extent possible, and non-recyclable wastes would be regularly transported offsite to a local solid waste disposal facility (TID2009a, section 5.14.1.2.2). The applicant estimates the project will generate 40 tons of non-hazardous waste per year (TID2009a, page 5.14-5).

Non-hazardous Liquid Wastes

Non-hazardous liquid wastes would be generated during facility operation, and are discussed in the **Soil and Water Resources** section of this document.

Hazardous Wastes

The project owner/operator would be considered the generator of hazardous wastes at the site during facility operations. Therefore, the project owner's unique hazardous waste generator identification number, obtained prior to construction in accordance with proposed condition of certification **WASTE-4**, would be retained and used for one ton per year of hazardous waste generated during facility operation (TID2009a, page 5.14-11).

Hazardous wastes expected to be generated during routine project operation include used hydraulic fluids, oils, greases, oily filters and rags, spent SCR catalyst, cleaning solutions and solvents, and batteries. In addition, spills and unauthorized releases of hazardous materials or hazardous wastes may generate contaminated soils or materials that may require corrective action and management as hazardous waste. Proper hazardous material handling and good housekeeping practices will help keep spill wastes to a minimum. However, to ensure proper cleanup and management of any contaminated soils or waste materials generated from hazardous materials spills, staff proposes condition of certification **WASTE-7** requiring the project owner/operator to report, clean-up, and remediate as necessary, any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. More information on hazardous material management, spill reporting, containment, and spill control and countermeasures plan provisions for the project are provided in the **Hazardous Material Management** section of the PSA.

The amounts of hazardous wastes generated during the operation of A2PP would be minor, with source reduction and recycling of wastes implemented whenever possible. The hazardous wastes would be temporarily stored on-site, transported offsite by licensed hazardous waste haulers, and recycled or disposed at authorized disposal facilities in accordance with established standards applicable to generators of hazardous waste (Title 22, CCR, §66262.10 et seq.). Should any operations waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed condition of certification **WASTE-5** to notify the CPM whenever the owner becomes aware of any such action.

Impact on Existing Waste Disposal Facilities

Non-hazardous Solid Wastes

Construction and operation of the proposed project would respectively generate approximately 600 cubic yards[4] (120 tons) and 200 cubic yards per year of nonhazardous solid waste (TID2009a, Section 5.14.2.4). The waste would be stored onsite for less than 30 days, and then recycled or disposed of in a Class III landfill.

Table 5.14-3 of the project AFC identifies four non-hazardous (Class III) waste disposal facilities that could potentially take the non-hazardous construction and operation wastes generated by the A2PP. These Class III landfills are all located in central California in Stanislaus County. The remaining capacity for the four landfills combined is over 10 million cubic yards. The total amount of nonhazardous waste generated from project construction and operation will contribute less than 1% of the available landfill capacity. Staff finds that disposal of the solid wastes generated by the A2PP can occur without significantly impacting the capacity or remaining life of any of these facilities.

Hazardous Wastes

Section 5.14.2.3.2 of the project AFC discusses the two Class I landfills in California: The Clean Harbor Landfill (Buttonwillow) in Kern County, and the Chemical Waste Management Landfill (Kettleman Hills) in Kings County. The Kettleman Hills facility also accepts Class I, II and Class III wastes. In total, there is in excess of 10 million cubic yards of remaining hazardous waste disposal capacity at these landfills, with approximately 30 years of remaining operating lifetimes.

Hazardous wastes generated during construction and operation would be recycled to the extent possible and practical. Approximately seven cubic yards of construction waste and five cubic yards per year of operation waste that cannot be recycled will be transported offsite to a permitted treatment, storage, or Class I disposal facility. The volume of hazardous waste from the A2PP requiring offsite disposal would be far less than staff's threshold of significance and would therefore not significantly impact the capacity or remaining life of the Class I waste facilities.

CUMULATIVE IMPACTS AND MITIGATION

There are several known projects within one mile radius of the project area in the city of Ceres and Stanislaus County which could contribute to the cumulative effects. These include the following projects:

- Martella Farms' four agricultural storage facilities and canopy structures,
- a commercial project for Stanislaus County Animal Shelter,
- completion of the Crows Landing Flea Market
- Ceres Lions Park wells,
- long range planning for West Ceres Specific Plan, Copper Trail Master Plan and Annexation, and Maple Glen Master Plan and Annexation,

[4] Cubic yards calculated using CalRecycle (California Integrated Waste Management Board construction/demolition and inert debris tools and resources – 400 pounds per cubic yard http://www.ciwmb.ca.gov/leatraing/Resources/CDI/Tools/Calculations.htm

- TID Hughson-Grayson 115-kV Transmission Line, and
- a Substation Project (refer to Hughson-Grayson 115-kV Transmission Line and Substation Project (TID2009a, Section 5.6.4).

The construction schedules are not published as of the writing of this staff assessment, and it is unlikely this would occur considering the current economic setting. Given the short 12-month A2PP construction schedule, cumulative impacts are not anticipated; therefore, Staff considers that there would be less than significant cumulative impact(s) to waste management during construction. The project area is consistent with the city and county long range planning policies for industrial development in this area; therefore cumulative impacts during project operations is not considered significant.

Staff has considered the minority populations (as identified in the **Socioeconomics Figure 1**) and low income populations in its cumulative impact analysis. There are no significant adverse direct or cumulative land use impact(s); therefore, there are no environmental justice issues.

As proposed, the amount of non-hazardous and hazardous wastes generated during construction and operation of the A2PP would add to the total quantity of waste generated in the State of California. However, project wastes would be generated in modest quantities, waste recycling would be employed wherever practical, and sufficient capacity is available at several treatment and disposal facilities to handle the volumes of wastes generated by the project. Therefore, staff concludes that the waste generated by the A2PP would not result in significant cumulative waste management impacts.

COMPLIANCE WITH LORS

Energy Commission staff concludes that the proposed A2PP would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during both facility construction and operation. The applicant is required to recycle and/or dispose hazardous and non-hazardous wastes at facilities licensed or otherwise approved to accept the wastes. Because hazardous wastes would be produced during both project construction and operation, the A2PP would be required to obtain a hazardous waste generator identification number from USEPA. The A2PP would also be required to properly store, package and label all hazardous waste, use only approved transporters, prepare hazardous waste manifests, keep detailed records, and appropriately train employees, in accordance with state and federal hazardous waste management requirements.

In the **Socioeconomics** section of this staff assessment, staff presents census information that shows that there are minority populations within one mile and six miles of the project site. Since staff has added conditions of certification that would reduce the risk associated with hazardous waste to a less than significant level, staff concludes that there will be no significant impact from construction or operation of the power plant on minority populations. Therefore, there are no environmental justice issues for Waste Management.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments provided.

CONCLUSIONS

Consistent with the main objectives for staff's waste management analysis (as noted in the Introduction section of this analysis), staff provides the following conclusions:

1. After review of the applicant's proposed waste management procedures, staff concludes that project wastes would be managed in compliance with all applicable waste management LORS. Staff notes that both construction and operation wastes would be characterized and managed as either hazardous or non-hazardous waste. All non-hazardous wastes would be recycled to the extent feasible, and non-recyclable wastes would be collected by a licensed hauler and disposed of at a permitted solid waste disposal facility. Hazardous wastes would be accumulated onsite in accordance with accumulation time limits (90, 180, 270, or 365 days depending on waste type and volumes generated), and then properly manifested, transported to, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies.

   However, to help ensure and facilitate ongoing project compliance with LORS, staff proposes Conditions of Certification **WASTE-1** through **7**. These conditions would require the project owner to do all of the following:

   - Ensure the project site is investigated and any contamination identified is remediated as necessary, with appropriate professional and regulatory agency oversight (**WASTE- 1, 2**, and **3**).
   - Obtain a hazardous waste generator identification number (**WASTE-4**).
   - Prepare Construction Waste Management and Operation Waste Management Plans detailing the types and volumes of wastes to be generated and how wastes will be managed, recycled, and/or disposed of after generation (**WASTE-3** and **6**).
   - Report any waste management-related LORS enforcement actions and how violations will be corrected (**WASTE-5**).
   - Ensure that all spills or releases of hazardous substances are reported and cleaned-up in accordance with all applicable federal, state, and local requirements (**WASTE-7)**.

2. Regarding impacts of project wastes on existing waste disposal facilities, the existing available capacity of the four Class III landfills that may be used to manage nonhazardous project wastes exceeds 10 million cubic yards (TID2009a, page 5.14-3).The total amount of nonhazardous wastes generated from construction and operation of A2PP would be minimal compared to the remaining landfill capacity Therefore, disposal of project generated non-hazardous wastes would have a less than significant impact on Class III landfill capacity.

   In addition, the two Class I disposal facilities that could be used for hazardous wastes generated by the construction and operation of A2PP have a combined

remaining capacity in excess of 10 million cubic yards. The total amount of hazardous wastes generated by the A2PP project would contribute less than 1% of the remaining permitted capacity. Impacts from disposal of A2PP generated hazardous wastes would also have a less than significant impact on the remaining capacity at Class I landfills.

Staff concludes that management of the waste generated during construction, and operation of the A2PP would not result in any significant adverse environmental impacts, and would comply with applicable LORS, if the waste management practices and mitigation measures proposed in the project AFC and staff's proposed conditions of certification are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall provide the resume of an experienced and qualified Professional Engineer or Professional Geologist, who shall be available for consultation during site characterization (if needed), excavation and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The Professional Engineer or Professional Geologist shall be given full authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM for review and approval.

WASTE-2 If potentially contaminated soil is identified during site characterization, demolition, excavation, or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Professional Engineer or Professional Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the Professional Engineer or Professional 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 Professional Engineer or Professional Geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of the Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the Professional Engineer or Professional Geologist to the CPM within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-3 The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency prior to generating any hazardous waste during construction and operations.

Verification: The project owner shall keep a copy of the identification number on file at the project site and provide the number to the CPM in the next Monthly Compliance Report.

WASTE-4 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed.

WASTE-5 The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility, and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- A description of all construction waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Management methods to be used for each waste stream, including temporary onsite storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.

Verification: The project owner shall submit the Construction Waste Management Plan to the CPM for approval no less than 30 days prior to the initiation of construction activities at the site.

WASTE-6 The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the facility, and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- A detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
- Management methods to be used for each waste stream, including temporary onsite storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;

- Information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- A detailed description of how facility wastes will be managed, and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
- A detailed description of how facility wastes will be managed and disposed upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

WASTE-7 The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are reported, cleaned-up, and remediated as necessary, in accordance with all applicable federal, state, and local requirements.

Verification: The project owner shall document all unauthorized releases and spills of hazardous substances, materials, or wastes that occur on the project property or related pipeline and transmission corridors. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; amount of contaminated soil/material generated; how release was managed and material cleaned-up; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have be generated by the release. Copies of the unauthorized spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

REFERENCES

CEC2009d – California Energy Commission/ F. Miller (tn: 52867). Data Requests Set 1 (#'s 1-84). Dated 8/13/09. Submitted to CEC/Docket Unit on 8/13/09.

CEC2009e – California Energy Commission/ F. Miller (tn: 54077). Status Report #2. Dated 11/03/09. Submitted to CEC/Docket Unit on 11/3/09.

CH2MHILL2009f – CH2MHILL/ S. Madams (tn: 53225). Data Response Set 1A, Response to CEC Staff Request 1-84 & Staff Query 1. Dated 9/14/09. Submitted to CEC/Docket Unit on 9/14/09.

CH2MHILL2009k – CH2MHILL/S. Madams (tn: 54257). Data Responses Set 1D, Responses to CEC Staff Data Requests 18 & 77-79. Dated 11/25/09. Submitted to CEC/Docket Unit on 11/25/09.

ESH2009c – Ellison, Schneider & Harris, LLP/ J. Harris (tn: 53120). Data Request 1-84. Dated on 9/2/09. Submitted to CEC/ Docket Unit on 9/2/09.

TID2009a –Turlock Irrigation District/ R. Baysinger (tn: 51502). Application for Certification, Volume 1& 2. Dated 5/11/09. Submitted to CEC/Docket Unit on 5/11/09.

WORKER SAFETY AND FIRE PROTECTION

Testimony of Alvin Greenberg, Ph.D. and Rick Tyler

SUMMARY OF CONCLUSIONS

Staff concludes that if the applicant for the proposed Almond 2 Power Plant (A2PP) provides a Project Construction Safety and Health Program and a revised and updated Project Operations and Maintenance Safety and Health Program that the applicant already has for the existing power plant at this site, as required by Conditions of Certification **WORKER SAFETY -1**and **-2,** and fulfils the requirements of **WORKER SAFETY -3** through **-5**, the project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable laws, ordinances, regulations, and standards. The proposed conditions of certification provide assurance that the Construction Safety and Health Program and the Operations and Maintenance Safety and Health Program prepared by the applicant will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable laws, ordinances, regulations, and standards.

Staff also concludes that the proposed project would not have significant impacts on local fire protection services. The proposed facility would be located in an area that is currently served by the Ceres Emergency Services – Fire Division (CFD). The fire risks at the proposed facility do not pose significant added demands on local fire protection services. In addition, staff finds that the available Hazmat Teams in Ceres, Modesto, and Stanislaus County are adequately equipped and staffed to respond to hazardous materials incidents at the proposed facility with an adequate response time.

INTRODUCTION

Worker safety and fire protection is regulated through laws, ordinances, regulations, and standards (LORS), at the federal, state, and local levels. Industrial workers at the facility operate equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to eliminate or reduce these hazards or to minimize the risk through special training, protective equipment, and procedural controls.

The purpose of this Staff Assessment (SA) is to assess the worker safety and fire protection measures proposed by the Almond 2 Power Plant (A2PP) and to determine whether the applicant has proposed adequate measures to:

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

WORKER SAFETY AND FIRE PROTECTION Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
29 U.S. Code § 651 et seq (Occupational Safety and Health Act of 1970)	This act mandates safety requirements in the workplace with the purpose of "[assuring] so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources" (29 USC § 651).
29 CFR sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations)	These sections define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector.
29 CFR sections 1952.170 to 1952.175	These sections provide federal approval of California's plan for enforcement of its own safety and health requirements, in lieu of most of the federal requirements found in 29 CFR §§1910.1 to 1910.1500.
State	
8 CCR all applicable sections (Cal/OSHA regulations)	Requires that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to safety matters during construction, commissioning, and operations of power plants, as well as safety around electrical components; fire safety; and hazardous materials use, storage, and handling.
24 CCR section 3, et seq.	Incorporates the current addition of the Uniform Building Code. Enforced by the Ceres Emergency Services – Fire Division (CFD).
Health and Safety Code section 25500, et seq.	Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at a facility.
Health and Safety Code sections 25500 to 25541	Requires a Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at a facility.
Local (or locally enforced)	
Specific Hazardous Material Handling Requirements	Provide response agencies with necessary information to address emergencies.
Emergency Response Plan	Allows response agency to integrate A2PP emergency response activities into any response actions.
Business Plan	Provides response agency with overview of A2PP purpose and operations.
RMP (Certified Unified Program Agency [CUPA], Administered by the County)	Provides response agency with detailed review of risks and hazards located at the A2PP and mitigation implemented to control risks or hazards. The CUPA for this project is the Stanislaus Environmental Resources Department – Hazardous Materials Division (SERD-HMD).
2007 California Fire Code	Contains general provisions for fire safety, including requirements for proper storage and handling of hazardous materials and listing of the information needed by emergency response personnel. Enforced by the Ceres Emergency Services – Fire Division (CFD).

SETTING

The proposed facility would be located immediately adjacent to but on the grounds of the existing Almond Power Plant in an industrial/agricultural area within the limits of the City of Ceres, California. Fire support services to the site would be under the jurisdiction of the Ceres Emergency Services – Fire Division (CFD). There are a total of four fire stations in the CFD system. The closest station to the A2PP site would be Station #3, located at 420 East Service Road (approximately 0.3 miles away) with a response time of 2 to 4 minutes (TID2009a, Section 5.16.2.4). The next closest station would be Station #1, located in downtown Ceres about 2.5 miles away. Their response time would be 4-5 minutes (CFD 2009). Backup support if necessary would be provided by the City of Modesto Fire Department and the Westport Fire Protection Division through mutual aid agreements (TID2009a, Section 5.16.2.4).

The CFD Station #3 would also be the first responder to hazardous materials incidents with backup support provided by other CFD stations and the City of Modesto Fire Department. Both CFD Station #3 and the City of Modesto fire department have trained personnel and equipment for an initial hazardous materials response. In the event of a large spill, the Stanislaus County Environmental Resources - Hazardous Materials Division, Hazardous Materials Response Team, would provide a full hazmat response (TID2009a, Section 5.5.2.5). The County's Hazmat Team is located at the Department of Environmental Resources on Cornucopia Way, about 0.5 miles from the A2PP site. Their response time would be 10-15 minutes (CFD 2009). Staff finds that these hazardous materials response teams are capable of handling any incident at the proposed facility in a timely manner.

WORKER SAFETY AND FIRE PROTECTION Table 2
Response Capabilities of the CFD*

CFD Station	Total Response Time**	Distance to A2PP	EMS/HazMat Capability***
Station #3	2 -4 min.	0.3 miles	Yes/Yes
Station #1	4-5 min	2.5 miles	Yes/Yes

*Source: Personal communications with the CFD (CFD 2009).
**Total response times are estimated from the moment a 911 call is made to arrival at the site and are dependent upon traffic conditions and other variables.
***All personnel are trained to EMT-1 level and as first responders for hazardous materials incidents. The department also has five paramedics and several trained hazmat technicians and specialists.

In addition to construction and operations worker safety issues, the potential exists for exposure to contaminated soil during site preparation. The Phase I Environmental Site Assessment (ESA) conducted for this site in 2009 identified no "Recognized Environmental Conditions" per the American Society for Testing and Materials Standards (ASTM) definition. That is, there was no evidence or record of any use, spillage or disposal of hazardous substances on the site, nor any other environmental condition that would require remedial action.

The Phase I ESA did however identify two areas of possible concern: potentially high levels of nitrates in groundwater and potential soil contamination of the site's fill material due to historical pesticide use. Based on the recommendations of the Phase I ESA, a Phase II ESA was conducted for the site to test soil for pesticide contamination. The

project does not intend to use ground water beyond using water for fire-fighting purposes from an existing well on the APP site although the project may have fresh water trucked to the A2PP site from the TID irrigation canal to the south. Therefore, no water testing was performed. The soil testing results indicate that the site does not have organochlorine pesticides above the detectable limit, nor is the soil contaminated with metals or arsenic above expected background levels (TID2009a, Section 5.14.1.1.1). In the event that any unexpected contamination is encountered during construction of the A2PP, proposed Conditions of Certification **Waste-1** and **Waste-2** require a registered professional engineer or geologist to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil. See the staff assessment section on **Waste Management** for a more detailed analysis of this topic.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Two issues are assessed in Worker Safety-Fire Protection:

1. The potential for impacts on the safety of workers during demolition, construction, and operations activities and

2. Fire prevention/protection, emergency medical response, and hazardous materials spill response during demolition, construction, and operations.

Worker safety issues are thoroughly addressed by California Division of Occupational Safety and Health (Cal-OSHA) regulations. If all LORS are followed, workers will be adequately protected. Thus, the standard for staff's review and determination of significant impacts on workers is whether or not the applicant has demonstrated adequate knowledge about and dedication to implementing all pertinent and relevant Cal-OSHA standards.

Regarding fire prevention matters, staff reviews and evaluates the on-site fire-fighting systems proposed by the applicant and the time needed for off-site local fire departments to respond to a fire, medical, or hazardous material emergency at the proposed power plant site. If on-site systems do not follow established codes and industry standards, staff recommends additional measures. Staff reviews and evaluates the local fire department capabilities and response time in each area and interviews the local fire officials to determine if they feel adequately trained, manned, and equipped to respond to the needs of a power plant. Staff then determines if the presence of the power plant would cause a significant impact on a local fire department. If it would, staff will recommend that the applicant mitigate this impact by providing increased resources to the fire department.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Worker Safety

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed A2PP project would 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 A2PP project to have well-defined policies and procedures, training, and hazard recognition and control at its facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation. The existing Almond Power Plant already has an operations safety and health plan and since the proposed A2 facility would be located within the site boundaries of the existing power plant, staff proposes that the project owner revise and update the existing operations plan. 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

A2PP encompasses construction and operation of a natural gas-fired facility. Workers will be exposed to hazards typical of construction and operation of a gas-fired simple cycle facility.

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

- Construction Injury and Illness Prevention Program (8 CCR § 1509)
- Construction Fire Prevention Plan (8 CCR § 1920)
- Personal Protective Equipment Program (8 CCR §§ 1514 to 1522)
- Emergency Action Program and Plan

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

- Electrical Safety Program,
- Motor Vehicle and Heavy Equipment Safety Program,
- Forklift Operation Program,
- Excavation/Trenching Program,
- Fall Protection Program,
- Scaffolding/Ladder Safety Program,
- Articulating Boom Platforms Program,
- Crane and Material Handling Program,

- Housekeeping and Material Handling and Storage Program,
- Respiratory Protection Program,
- Employee Exposure Monitoring Program,
- Hand and Portable Power Tool Safety Program,
- Hearing Conservation Program,
- Back Injury Prevention Program,
- Hazard Communication Program,
- Heat and Cold Stress Monitoring and Control Program,
- Pressure Vessel and Pipeline Safety Program,
- Hazardous Waste Program,
- Hot Work Safety Program, and
- Permit-Required Confined Space Entry Program.

The Application for Certification (AFC) includes an adequate outline of the Construction Health & Safety Program (TID2009a, Section 5.16.2.3.1). Staff proposes that prior to the start of construction of A2PP, detailed programs and plans be provided to the California Energy Commission Compliance Project Manager (CPM) and to the CFD pursuant to the Condition of Certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Prior to the start of operations at A2PP, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

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

In addition, the requirements under General Industry Safety Orders (8 CCR §§ 3200 to 6184), Electrical Safety Orders (8 CCR §§ 2299 to 2974), and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 to 544) will be applicable to the project. Written safety programs for A2PP, which the applicant will develop, will ensure compliance with the above-mentioned requirements.

The AFC includes adequate outlines of the Injury and Illness Prevention Program, Personal Protective Equipment Program, Emergency Action Plan, and Fire Protection and Prevention Program (TID2009a, Section 5.16.2.3.2). Staff proposes that the existing operations plans be revised and updated and that prior to operation of A2PP, all detailed programs and plans be provided to the CPM and CFD pursuant to Condition of Certification **WORKER SAFETY-2**.

Safety and Health Program Elements

As mentioned above, the applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operations Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both safety and health programs are as follows:

Injury and Illness Prevention Program

The Injury and Illness Prevention Program (IIPP) will include the following components as presented in the AFC (TID2009a, Section 5.16.2.3.2):

- identity of person(s) with authority and responsibility for implementing the program;
- establish a safety and health policy;
- establish work rules and safe work practices;
- system for ensuring that employees comply with safe and healthy work practices;
- system for facilitating employer-employee communications;
- procedures for identifying and evaluating workplace hazards and developing necessary program(s);
- methods for correcting unhealthy/unsafe conditions in a timely manner;
- specific safety procedures; and
- training and instruction.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The AFC outlines a proposed Fire Protection and Prevention Program which is acceptable to staff (TID2009a, Section 5.16.2.3.2). The plan would include the following:

- general requirements;
- fire hazard inventory, including ignition sources and mitigation;
- housekeeping practices and proper materials storage;
- employee alarm/communication system;
- portable fire extinguishers;
- fixed firefighting equipment;
- fire control;
- flammable and combustible liquid storage;
- use of flammable and combustible liquids;
- dispensing and disposal of liquids;
- training; and
- personnel to contact for information on plan contents.

Staff proposes that the applicant submit a final Fire Prevention Plan to the CPM for review and approval and to the CFD for review and comment to satisfy proposed Conditions of Certification **WORKER SAFETY-1** and **WORKER SAFETY-2**.

Personal Protective Equipment Program

California regulations require personal protective equipment 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 to 3400). The A2PP operational environment will require personal protective equipment. The Personal Protective Equipment Program ensures that employers comply with the applicable requirements for the program and provides employees with the information and training necessary to protect them from potential workplace hazards.

All safety equipment must meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and will carry markings, numbers, or certificates of approval. Respirators must meet NIOSH and Cal/OSHA standards. Each employee must be provided with the following information pertaining to the protective clothing and equipment:

- proper use, maintenance, and storage;
- when to use the protective clothing and equipment;
- benefits and limitations; and
- when and how to replace the protective clothing and equipment.

In addition, each employee must be checked for proper fit and for their medical capability of wearing the equipment.

Emergency Action Plan

California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (TID2009a, Section 5.16.2.3.2).

The Emergency Action Plan will address the following:

- emergency escape procedures and emergency escape route for the facility;
- procedures to be followed by employees who remain to operate critical plant components;
- procedures to account for all employees after evacuation has been completed;
- rescue and medical duties;
- fire and emergency reporting procedures;
- alarm and communication system;
- personnel to contact for information on plan contents;
- response procedures for ammonia release; and

- training requirements.

Written Safety Program

In addition to the specific plans listed above, additional LORS called “safe work practices” apply to the project. Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs include, but are not limited to, the programs found under the heading Construction Safety and Health Program earlier in this staff assessment.

Safety Training Programs

Employees will be trained in the safe work practices described in the above-referenced safety programs.

Additional Mitigation Measures

Protecting construction workers from injury and disease is among the greatest challenges in occupational safety and health. The following facts are reported by the National Institute for Occupational Safety and Health (NIOSH):

- More than 7 million persons work in the construction industry, representing 6 percent of the labor force. Approximately 1.5 million of these workers are self-employed.
- Of approximately 600,000 construction companies, 90 percent employ fewer than 20 workers. Few have formal safety and health programs.
- From 1980 to 1993, an average of 1,079 construction workers were killed on the job each year, totaling more fatal injuries than in any other industry.
- Falls caused 3,859 construction worker fatalities (25.6 percent) between 1980 and 1993.
- Construction injuries account for 15 percent of workers' compensation costs.
- Assuring safety and health in construction is complex, involving short-term work sites, changing hazards, and multiple operations and crews working in close proximity.
- In 1990, Congress directed NIOSH to undertake research and training to reduce diseases and injuries among construction workers in the United States. Under this mandate, NIOSH funds both intramural and extramural research projects.

The hazards associated with the construction industry are thus well-documented. These hazards increase in complexity in the multi-employer work sites typical of large complex industrial-type projects such as the construction of gas-fired power plants. In order to reduce and/or eliminate these hazards, it has become standard industry practice to hire a Construction Safety Supervisor to ensure a safe and healthful environment for all personnel. This has been evident in the audits of power plants under construction recently conducted by the staff. The federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers,

and other professional designations. The goal of these partnerships is to encourage construction subcontractors to improve their safety and health performance; to assist them in striving for the elimination of the four hazards (falls, electrical, caught in/between and struck-by hazards), which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections; to prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and to recognize those subcontractors with exemplary safety and health programs.

To date, there are no OSHA or Cal/OSHA requirements that an employer hire or provide for a Construction Safety Officer. OSHA and Cal/OSHA regulations do, however, require that safety be provided by an employer and the term “Competent Person” is used in many OSHA and Ca/-OSHA standards, documents, and directives. A “Competent Person” is usually defined by OSHA as an individual who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Therefore, in order to meet the intent of the OSHA standard to provide for a safe workplace during power plant construction, staff proposes Condition of Certification **WORKER SAFETY-3,** which would require the applicant/project owner to designate and provide for a power plant site Construction Safety Supervisor. This condition has been a standard requirement for all power plants licensed by the Energy Commission since 2005.

As discussed above, the hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer work sites typical of large complex industrial-type projects such as the construction of gas-fired power plants.

Accidents, fires, and a worker death have occurred at Energy Commission-certified power plants in the recent past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by Energy Commission staff in safety audits conducted in 2005 at several power plants under construction. The findings of the audit staff include, but are not limited to, such safety oversights as:

- lack of posted confined space warning placards/signs;
- confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to commissioning team and then to operations;
- dangerous placement of hydraulic elevated platforms under each other;
- inappropriate placement of fire extinguishers near hotwork;
- dangerous placement of numerous power cords in standing water on the site, thus increasing the risk of electrocution;
- construction of an unsafe aqueous ammonia unloading pad;

- inappropriate and unsecure placement of above-ground natural gas pipelines inside the facility but too close to the perimeter fence; and
- lack of adequate employee or contractor written training programs addressing proper procedures to follow in the event of finding suspicious packages or objects either on or off site.

In order to reduce and/or eliminate these hazards, it is necessary for the Energy Commission to have a professional Safety Monitor on site to track compliance with Cal/OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand over to operational status. These requirements are outlined in proposed Condition of Certification **WORKER SAFETY-4**. A Safety Monitor, hired by the project owner yet reporting to the Chief Building Official and CPM, would serve as an extra set of eyes to ensure that safety procedures and practices are fully implemented at all power plants certified by the Energy Commission. During the audits conducted by staff, most site safety professionals welcomed the audit team and actively engaged the team in questions about its findings and recommendations. These safety professionals recognized that safety requires continuous vigilance and that the presence of an independent audit team provided a fresh perspective of the site. As with **WORKER SAFETY-3,** this condition has been a standard requirement for all power plants licensed by the Energy Commission since 2005.

Fire Hazards

During construction and operation of the proposed A2PP project, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas, hydraulic fluid, mineral oil, or insulating fluid at the power plant switchyard; or flammable liquids, explosions, and over-heated equipment may cause small fires. Major structural fires in areas without automatic fire detection and suppression systems are unlikely to develop at power plants. Fires and explosions of natural gas or other flammable gasses or liquids are rare. Compliance with all LORS will be adequate to assure protection from all fire hazards.

Staff reviewed the information provided in the AFC and corresponded with representatives of the Ceres Emergency Services – Fire Division (CFD) 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. The project will rely on both on-site fire protection systems and local fire protection services. The on-site 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 CFD (TID2009a Section 5.16.2.4 and CFD 2009).

Construction

During construction, the permanent fire suppression system for the A2PP site would be installed as soon as practical, and until then hose extensions would be added to the existing Almond Power Plant (APP) hydrants so that they could reach the A2PP construction site (CH2MHILL2009f, Data Response #81). In addition, portable fire

extinguishers would be placed throughout the site at appropriate intervals and safety procedures and training would be implemented according to the guidelines of the Construction Fire Protection and Prevention Program (TID2009a, Section 5.16.2.3.1).

Operation

The information in the AFC indicates that the project intends to meet the fire protection and suppression requirements of the California Fire Code, all applicable recommended NFPA standards (including Standard 850 addressing fire protection at electric generating plants), and all Cal/OSHA requirements. Access to the project site would be provided via two gated access roads, one equipped with a remote, card-activated gate for primary access and the other equipped with a manual lock for emergency vehicle access. The secondary access would be located about 200 feet east of the primary access gate at the southern fenceline (CH2MHILL2009f, Data Response #83). Having two access points is sound fire safety procedure and allows for fire department vehicles and personal to access the site should the main gate be blocked.

Fire suppression elements in the proposed plant will include both fixed and portable fire extinguishing systems. Fire water will be supplied by a well located on the site of the existing APP and stored in an existing fire water storage tank at the APP with a dedicated firefighting supply of 250,000 gallons. The fire water would feed an underground fire loop piping system that would be expanded to service the proposed A2PP, with water pressure maintained by one electric jockey pump and one diesel-driven backup pump (CH2MHILL2009f, Data Response #80). The fire water loop will supply both fire hydrants and the fixed suppression systems and would be designed to provide two hours of protection for a single worst-case fire (TID2009a, Section 2.1.11). The applicant indicated that the dedicated firewater supply would last for three hours of fire protection with one fire hydrant and one transformer deluge system (the largest user) operating at 500 gpm and 750 gpm, respectively (CH2MHILL2009f, Date Response #82).

A fixed water sprinkler system would be installed in areas of risk including administrative, control, warehouse, and maintenance buildings and the water treatment building in accordance with NFPA requirements and local codes. A carbon dioxide and dry chemical fire protection system would be provided for each of the combustion turbine generators and accessory equipment. The system would have fire detection sensors that would trigger alarms and turn off ventilation, close ventilation openings, and automatically actuate the protection system (TID2009a, Sections 2.1.11 and 2.2.1.1.2).

In addition to the fixed fire protection system, the appropriate class of service portable extinguishers would be located throughout the facility at code-approved intervals (TID2009a, Section 2.1.11). These systems are standard requirement by the NFPA and the Uniform Fire Code, and staff has determined that they will ensure adequate fire protection. The applicant would be required by proposed Conditions of Certification **WORKER SAFETY-1** and **-2** to provide the final Fire Protection and Prevention Program to staff and to the CFD prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures.

Emergency Medical Services Response

Staff conducted a statewide survey to determine the frequency of emergency medical services (EMS) response and off-site fire-fighter response for natural gas-fired power plants in California. The purpose of the analysis was to determine what impact, if any, power plants may have on local emergency services. Staff has concluded that incidents at power plants that require fire or EMS response are infrequent and represent an insignificant impact on the local fire departments, except for rare instances where a rural fire department has mostly volunteer firefighting staff. However, staff has determined that the potential for both work-related and nonwork-related heart attacks exists at power plants. In fact, staff's research on the frequency of EMS response to gas-fired power plants shows that many of the responses for cardiac emergencies involved nonwork-related incidences, including those involving visitors.

The need for prompt response within a few minutes is well documented in the medical literature. Staff believes that the quickest medical intervention can only be achieved with the use of an on-site automatic external defibrillator (AED); the response from an off-site provider would take longer regardless of the provider location. This fact is also well documented and serves as the basis for the maintenance of on-site cardiac defibrillation devices at many private and public locations (e.g., airports, factories, government buildings). Therefore, staff concludes that, with the advent of modern cost-effective cardiac defibrillation devices, it is proper in a power plant environment to maintain such a device on site to address cardiac arrythmias resulting from industrial accidents or other nonwork-related causes.

Therefore, staff proposes a Condition of Certification **WORKER SAFETY-5** which would require that a portable AED be located on site, that all power plant employees on site during operations be trained in its use, and that a representative number of workers on site during construction and commissioning also be trained in its use.

CUMULATIVE IMPACTS AND MITIGATION

Staff reviewed the potential for the construction and operation of the proposed A2PP project combined with existing and expected new facilities in the area to result in impacts on the fire and emergency service capabilities of the CFD. The CFD stated that they don't anticipate that the proposed A2PP would have any impact on their capabilities to serve their jurisdiction. Fire Marshall Bryan Nicholes could not recall ever receiving an emergency call from the existing APP, and therefore he does not expect the A2PP to add a burden to the fire department (CFD 2009).

Given 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.

CONCLUSIONS

Staff concludes that if the applicant for the proposed A2PP project provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program as required by Conditions of Certification **WORKER**

SAFETY -1, and **-2** and fulfils the requirements of Conditions of Certification **WORKER SAFETY-3** through **-5**, the project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. Staff also concludes that incidents at power plants that require fire or EMS response are infrequent and thus will represent an insignificant impact on the local fire department.

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:

1. a Construction Personal Protective Equipment Program;
2. a Construction Exposure Monitoring Program;
3. a Construction Injury and Illness Prevention Program;
4. a Construction Emergency Action Plan; and
5. a Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring Program, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the programs with all applicable Safety Orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the Ceres Emergency Services – Fire Division (CFD) for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the CFD stating the Fire Department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of a revised and updated Project Operations and Maintenance Safety and Health Program containing the following:

1. an Operation Injury and Illness Prevention Plan;
2. an Emergency Action Plan;
3. a Hazardous Materials Management Program;
4. an Operation Fire Prevention Program (8 CCR § 3221); and
5. a Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the programs with all applicable Safety Orders. The Operation Fire Prevention Plan, the Hazardous Materials Management Program, and the Emergency Action Plan shall also be submitted to the CFD for review and comment.

Verification: At least 30 days prior to the start of first-fire or commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the CFD stating the Fire Department's comments on the Operations Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards; is capable of identifying workplace hazards relating to the construction activities; and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

1. have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;

2. assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;

3. assure that all construction and commissioning workers and supervisors receive adequate safety training;

4. complete accident and safety-related incident investigations and emergency response reports for injuries and inform the CPM of safety-related incidents; and

5. assure that all the plans identified in Conditions of Certification Worker Safety-1 and -2 are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement (CSS) shall be submitted to the CPM within one business day.

The CSS shall submit in the Monthly Compliance Report a monthly safety inspection report to include:

- record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- summary report of safety management actions and safety-related incidents that occurred during the month;

- report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO and will be responsible for verifying that the Construction Safety Supervisor, as required in Condition of Certification **WORKER SAFETY-3**, implements all appropriate Cal/OSHA and Energy Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: Prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable automatic external defibrillator (AED) is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in use of the AED and shall be on site whenever the workers that they supervise are on site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all shift foremen. During operations, all power plant employees shall be trained in use of the AED. The training program shall be submitted to the CPM for review and approval.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM proof that a portable automatic external defibrillator (AED) exists on site and a copy of the training and maintenance program for review and approval.

REFERENCES

CFD (Ceres Emergency Services – Fire Division) 2009 – Personal communications with Fire Marshall/Fire Chief Bryan Nicholes, August 20.

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.

CH2MHILL2009f – CH2MHILL/ S. Madams (tn: 53225). Data Response Set 1A, Response to CEC Staff Request 1-84 & Staff Query 1. Dated 9/14/09. Submitted to CEC/Docket Unit on 9/14/09.

TID2009a –Turlock Irrigation District/ R. Baysinger (tn: 51502). Application for Certification, Volume 1& 2. Dated 5/11/09. Submitted to CEC/Docket Unit on 5/11/09.

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.

U.S. OSHA (United States Occupational Safety and Health Administration). 1993 – Process Safety Management / Process Safety Management Guidelines for Compliance. U.S. Department of Labor, Washington, D.C.

ENGINEERING ASSESSMENT

FACILITY DESIGN

Testimony of Erin Bright

SUMMARY OF CONCLUSIONS

The California Energy Commission staff concludes that the design, construction, and eventual closure of the Almond 2 Power Plant (A2PP) and its linear facilities would likely comply with applicable engineering laws, ordinances, regulations, and standards. The proposed conditions of certification, below, would ensure compliance with these laws, ordinances, regulations, and standards.

INTRODUCTION

Facility design encompasses the civil, structural, mechanical, and electrical engineering design of the A2PP. The purpose of this analysis is to:

- verify that the laws, ordinances, regulations, and standards (LORS) that apply to the engineering design and construction of the project have been identified;
- verify that both the project and its ancillary facilities are sufficiently described, including proposed design criteria and analysis methods, in order to provide reasonable assurance that the project will be designed and constructed in accordance with all applicable engineering LORS, in a manner that also ensures the public health and safety;
- determine whether special design features should be considered during final design to address conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish the conditions of certification used to monitor and ensure compliance with the engineering LORS, in addition to any special design requirements.

Subjects discussed in this analysis include:

- identification of the engineering LORS that apply to facility design;
- evaluation of the applicant's proposed design criteria, including identification of criteria essential to public health and safety;
- proposed modifications and additions to the application for certification (AFC) necessary for compliance with applicable engineering LORS; and
- conditions of certification proposed by staff to ensure that the project will be designed and constructed to ensure public health and safety and comply with all applicable engineering LORS.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical, and electrical) are described in the AFC (TID 2009a). Key LORS are listed in **FACILITY DESIGN Table 1** below.

FACILITY DESIGN Table 1
Key Engineering Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards
State	2007 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
Local	Stanislaus County regulations and ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

SETTING

A2PP will be located on approximately 4.6 acres adjacent to the existing 48 MW Almond Power Plant within the city limits of Ceres in Stanislaus County (TID 2009a, AFC §§ 1.1, 2.0, 2.1). The site lies in Seismic Risk Zone D (TID 2009a, AFC § 2.2.1.1.1). For more information on the site and related project description, please see the **Project Description** section of this document. Additional engineering design details are contained in the AFC (TID 2009a, AFC Appendix 2B).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The purpose of this analysis is to ensure that the project would be built to applicable engineering codes and ensure public health and life safety. This analysis further verifies that applicable engineering LORS have been identified and that the project and its ancillary facilities have been described in adequate detail. It also evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. These conditions allow both the California Energy Commission (Energy Commission) compliance project manager (CPM) and the applicant to adopt a compliance monitoring scheme that will verify compliance with these LORS.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access, in addition to the criteria for designing and constructing linear support facilities such as natural gas and electric transmission interconnections. The applicant proposes the use of accepted industry standards (see

the AFC, §§ 2.2.1 and 2.2.1.1.1 and Appendix 2B) for a representative list of applicable industry standards), design practices, and construction methods in preparing and developing the site. Staff concludes that this project, including its linear facilities, would most likely comply with all applicable site preparation LORS and proposes conditions of certification (see below and the **Geology and Paleontology** section of this document) to ensure that compliance.

MAJOR STRUCTURES, SYSTEMS, AND EQUIPMENT

Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. See condition of certification (**GEN-2)**, below.

A2PP shall be designed and constructed to the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect when the design and construction of the project actually begin. If the initial designs are submitted to the chief building official (CBO) for review and approval after the update to the 2007 CBSC takes effect, the 2007 CBSC provisions shall be replaced with the updated 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 according to their appropriate lateral force procedure, staff has included Condition of Certification **STRUC-1**, below, which, in part, requires the project CBO's review and approval of the owner's proposed lateral force procedures before construction begins.

PROJECT QUALITY PROCEDURES

The project would be designed and built in conformance with a quality program intended to ensure that its systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with all appropriate power plant technical codes and standards. Compliance with design requirements will be verified through specific inspections and audits. Implementation of this quality assurance/quality control (QA/QC) program will ensure that A2PP is actually designed, procured, fabricated, and installed as described in this analysis (TID 2009a, AFC § 2.2.2.5).

COMPLIANCE MONITORING

Under Section 104.1 in Appendix Chapter 1 of the CBC, the CBO is authorized and directed to enforce all provisions of the CBC. The Energy Commission itself serves as the building official and has the responsibility to enforce the code for all of the energy

facilities it certifies. In addition, the Energy Commission has the power to interpret the CBC and adopt and enforce both rules and supplemental regulations that clarify application of the CBC's provisions.

The Energy Commission's design review and construction inspection process conforms to CBC requirements and ensures that all facility design conditions of certification are met. As provided by section 103.3 in Appendix Chapter 1 of the CBC, the Energy Commission appoints experts to perform design review and construction inspections and act as delegate CBOs on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise that is not provided by the local official alone. The applicant, through permit fees provided by the CBC, section 108 in Appendix Chapter 1, pays the cost of these reviews and inspections. While building permits in addition to Energy Commission certification are not required for this project, the applicant, consistent with CBC section 108, pays in lieu of CBC permit fees to cover the costs of these reviews and inspections.

Engineering and compliance staff will invite Stanislaus County, the City of Ceres or a third-party engineering consultant to act as delegate CBO for this project. When an entity has been assigned CBO duties, Energy Commission staff will complete a memorandum of understanding (MOU) with that entity to outline both 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 engineers who will design and build the proposed project (Conditions of Certification **GEN-1** through **GEN-8**). These engineers must be registered in California and sign and stamp every submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that every element of the project's construction (subject to CBO review and approval) be approved by the CBO before it is performed. They also require that qualified special inspectors perform or oversee special inspections required by all applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written so that no element of construction (of permanent facilities subject to CBO review and approval) that could be difficult to reverse or correct can proceed without prior CBO approval. Elements of construction that are not difficult to reverse may proceed without approval of the plans. The applicant bears the responsibility to fully modify construction elements in order to comply with all design changes resulting from the CBO's subsequent plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service (decommissioning) when it reaches the end of its useful life ranges from "mothballing" to the removal of all equipment and appurtenant facilities and subsequent restoration of the site. Future conditions that could affect decommissioning are largely unknown at this time.

In order to ensure that decommissioning will be completed in a manner that is environmentally sound, safe, and protects the public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval before the project's decommissioning begins. The plan shall include a discussion of:

- proposed decommissioning activities for the project and all appurtenant facilities that were constructed as part of the project;
- all applicable LORS and local/regional plans and proof of adherence to those 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.

Satisfying the above requirements should serve as adequate protection, even in the unlikely event that the project is abandoned. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure Plan.

CONCLUSIONS AND RECOMMENDATIONS

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents directly apply 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 likely comply with applicable engineering LORS.

3. The proposed conditions of certification will ensure that A2PP is designed and constructed in accordance with applicable engineering LORS. This will be accomplished through design review, plan checking, and field inspections that will be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.

4. Though future conditions that could 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** section of this document prior to decommissioning, decommissioning procedures will comply with all applicable engineering LORS.

Energy Commission staff recommends that:

1. The proposed conditions of certification be adopted to ensure that the project is designed and constructed in a manner that protects the public health and safety and complies with all applicable engineering LORS;

2. The project be designed and built to the 2007 CBSC (or successor standards, if in effect when initial project engineering designs are submitted for review); and

3. The CBO reviews the final designs, checks plans, and performs field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering laws, ordinances, regulations and standards (LORS) in effect at the time initial design plans are submitted to the chief building official (CBO) for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility (2007 CBC, Appendix Chapter 1, § 101.2, Scope). All transmission facilities (lines, switchyards, switching stations, and substations) are covered in the 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 the successor to the 2007 CBSC is in effect, the 2007 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the compliance project manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO (2007 CBC, Appendix Chapter 1, § 110, Certificate of Occupancy).

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that

requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawings and master specifications list. The master drawings and master specifications list shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures, systems, and equipment. Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. The schedule shall contain the date of each submittal to the CBO. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 60 days (or a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, and the master drawings and 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, systems, and equipment defined above in Condition of Certification **GEN-2**. Major structures and equipment shall be added to or deleted from the list only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, 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 2007 CBC (2007 CBC, Appendix Chapter 1, § 108, Fees; Chapter 1, Section 108.4, Permits, Fees, Applications and Inspections), 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 otherwise agreed upon 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 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 the resident engineer in charge of the project (2007 California Administrative Code, § 4-209, Designation of Responsibilities). All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the conditions of certification in the **Transmission System Engineering** section of this document.

The resident engineer 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 that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The resident engineer shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;

2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;

3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;

4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets 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 when they do not conform to approved plans and specifications.

The resident engineer shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the resident engineer 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 within a project owner- and CBO-approved alternative time frame) 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 resident engineer and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the resident engineer and other delegated engineer(s) within five days of the approval.

If the resident engineer or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days 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 civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and 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: 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; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require 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 the 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 (for example, 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 (2007 CBC, Appendix Chapter 1, § 104, Duties and Powers 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, geotechnical, or soils reports 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 the design of), 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; and 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 resident engineer during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to 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, geotechnical or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement, or collapse when saturated under load (2007 CBC, Appendix J, § J104.3, Soils Report; Chapter 18, § 1802.2, Foundation and Soils Investigations);

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2007 CBC, Appendix J, section J105, Inspections, and the 2007 California Administrative Code, section 4-211, Observation and Inspection of Construction (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and

4. Recommend field changes to the civil engineer and resident engineer.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations (2007 CBC, Appendix Chapter 1, § 114, Stop Orders).

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a 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 2007 California Administrative Code, section 4-211, Observation and Inspection of Construction (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;

2. Provide consultation to the resident engineer 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 to 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 within a project owner- and CBO-approved alternative time frame) 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 within a project owner- and CBO-approved alternative time frame) 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 2007 CBC, Chapter 17, Section 1704, Special Inspections; Chapter 17A, Section 1704A, Special Inspections; and Appendix Chapter 1, Section 109, Inspections. All transmission facilities (lines, switchyards, switching stations, and substations)

are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on site requiring special inspection (including structural, piping, tanks, and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. Observe the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and resident engineer. All discrepancies shall be brought to the immediate attention of the resident engineer for correction, then, if uncorrected, to the CBO and the CPM for corrective action (2007 CBC, Chapter 17, § 1704.1.2, Report Requirements); and

4. Submit a final signed report to the resident engineer, 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, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or within a project owner- and CBO-approved alternative time frame) 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 required corrective actions (2007 CBC, Appendix Chapter 1, § 109.6, Approval Required; Chapter 17, § 1704.1.2, Report Requirements). 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, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at an alternative site approved by the CPM during the operating life of the project (2007 CBC, Appendix Chapter 1, § 106.3.1, Approval of Construction Documents). Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next monthly compliance report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the CBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" files (Adobe .pdf 6.0), with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, or foundation investigation reports required by the 2007 CBC, Appendix J, section J104.3, Soils Report, and Chapter 18, section 1802.2, Foundation and Soils Investigation.

Verification: At least 15 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area (2007 CBC, Appendix Chapter 1, § 114, Stop Work 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 2007 CBC, Appendix Chapter 1, section 109, Inspections, and Chapter 17, section 1704, Special Inspections. 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 (2007 CBC, Chapter 17, § 1704.1.2, Report Requirements). The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans (2007 CBC, Chapter 17, § 1703.2, Written Approval).

Verification: Within 30 days (or within a project owner- and CBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans and that the facilities are adequate for their intended purposes, along with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit plans, calculations and other supporting documentation to the CBO for design review and acceptance for all project structures and equipment identified in the CBO-approved master drawing and master specifications lists. The design plans and calculations shall include the lateral force procedures and details as well as vertical calculations.

Construction of any structure or component shall not begin 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 (for example, 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 (2007 CBC, Appendix Chapter 1, § 109.6, Approval Required);

3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation (2007 California Administrative Code, § 4-210, Plans, Specifications, Computations and Other Data);

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 (2007 CBC, Appendix Chapter 1, § 106.3.4, Design Professional in Responsible Charge); and

5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS (2007 CBC, Appendix Chapter 1, § 106.3.4, Design Professional in Responsible Charge).

Verification: At least 60 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in the CBO-approved master drawing and master specifications list, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in 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 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 2007 CBC, Chapter 17, section 1704, Special Inspections, and section 1709.1, Structural Observations.

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 (2007 CBC, Chapter 17, § 1704.1.2, Report Requirements). 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 necessary to obtain the CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2007 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing (2007 CBC, Appendix Chapter 1, § 106.1, Submittal Documents; § 106.4, Amended Construction Documents; 2007 California Administrative Code, § 4-215, Changes in Approved Drawings and Specifications).

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 the 2007 CBC, Chapter 3, Table 307.1(2), shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or within a project owner- and CBO-approved alternate time frame) 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 the CBO-approved master drawing and master specifications list. 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 that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations, and industry standards (2007 CBC, Appendix Chapter 1, § 106.3.4, Design Professional in Responsible Charge), which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI/NFPA Z223.1 (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);
- Stanislaus County codes; and
- City of Ceres codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency (2007 CBC, Appendix Chapter 1, § 103.3, Deputies).

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in the CBO-approved master drawing and master specifications list, 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 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 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 that installation (2007 CBC, Appendix Chapter 1, § 109.5, 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 within a project owner- and CBO-approved alternative time frame) 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 that 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 (2007 CBC, Appendix Chapter 1, § 109.3.7, Energy Efficiency Inspections; § 106.3.4, Design Professionals in Responsible Charge).

Verification: At least 30 days (or within a project owner- and CBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations (2007 CBC, Appendix Chapter 1, § 106.1, 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 (2007 CBC, Appendix Chapter 1, § 109.6, Approval Required; § 109.5, Inspection Requests). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans shall include:

1. one-line diagrams for the 13.8 kV, 4.16 kV, and 480 V systems; and

2. system grounding drawings.

B. Final plant calculations must establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers, and protective relay settings for the 13.8 kV, 4.16 kV, and 480 V systems;
6. system grounding requirements; and
7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the monthly compliance report:

1. Receipt or delay of major electrical equipment;
2. Testing or energization of major electrical equipment; and
3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or within a project owner- and CBO-approved alternative time frame) 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

TID2009a –Turlock Irrigation District/ R. Baysinger (tn: 51502). Application for Certification, Volume 1& 2. Dated 5/11/09. Submitted to CEC/Docket Unit on 5/11/09.

GEOLOGY AND PALEONTOLOGY

Testimony of Dal Hunter, Ph.D., C.E.G.

SUMMARY OF CONCLUSIONS

The proposed Turlock Irrigation District Almond 2 Power Plant (A2PP) site is located in the Great Valley physiographic province approximately 30 miles east of the boundary between the Coast Ranges and the Great Valley physiographic provinces. The project site would be located in Stanislaus County approximately 5 miles south of the City of Modesto and 2 miles east of the City of Ceres, California. Potential geologic hazards include strong earthquake-related ground shaking due to the site's geologic setting; liquefaction and associated lateral spreading of loose and submerged granular soils; excessive consolidation settlement of native fine grain soils; and expansive clay soils. The possible impact of these geologic hazards on the proposed facility would have to be mitigated, to the extent practical, through structural designs required by the 2007 California Building Code (CBC). In addition, the design-level geotechnical investigation, required for the project by proposed **Facility Design** Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1**, must present geotechnical engineering design recommendations that would also mitigate these potential geologic hazards to a less than significant level.

There are no known viable geologic or mineralogical resources at the proposed A2PP project site. Known paleontological sites are present within close proximity of the proposed project site and its linears. The artificial fill and Quaternary age sediments which make up the near-surface formation are unlikely to host scientifically significant fossils, but Pleistocene sediments which underlie the fill layer have yielded significant fossils. Potential impacts to paleontological resources due to construction activities would be mitigated through worker training and monitoring by qualified paleontologists, as required by Conditions of Certification **PAL-1** through **PAL-7**.

Based on its independent research and review, the California Energy Commission (Energy Commission) believes that the potential is low for significant adverse cumulative impacts to the project from geologic hazards during its design life, and to potential geologic, mineralogic, and paleontologic resources from the construction, operation, and closure of the proposed project. It is staff's opinion that the A2PP project will be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards (LORS) and in a manner that both protects environmental quality and assures public safety..

INTRODUCTION

In this section, Energy Commission staff discusses the potential impacts of geologic hazards on the proposed A2PP project as well as the project's impact on geologic, mineralogic, and paleontologic resources. Staff's objective is to ensure that there would be no consequential adverse impacts to significant geological and paleontological resources during the project construction, operation, and closure and that operation of the plant would not expose occupants to high-probability geologic hazards. A brief geological and paleontological overview is provided. The section concludes with staff's proposed monitoring and mitigation measures for geologic hazards and geologic,

mineralogic, and paleontologic resources, with the proposed conditions of certification. Conditions of certification are conditions with respect to design and/or construction, mandated of the applicant by the Energy Commission as a part of its approval, which outline required procedures to mitigate impacts to potential resources and potential impacts to the facility from geologic hazards.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Applicable laws, ordinances, regulations, and standards (LORS) are listed in the application for certification (AFC) (TID 2009). The following briefly describes the current LORS for both geologic hazards and resources and mineralogic and paleontologic resources.

Geology and Paleontology Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	The proposed A2PP project is not located on federal land. There are no federal LORS for geologic hazards and resources for this site.
State	
California Building Code (2007)	The CBC (2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control). The CBC has adopted provisions in the International Building Code (ICC 2006).
Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code (PRC), sections 2621–2630	The Act mitigates against surface fault rupture of known active faults beneath occupied structures. Requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings. The project site is not located within a designated Alquist-Priolo Fault Zone.
The Seismic Hazards Mapping Act, PRC sections 2690–2699	Areas are identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches.
PRC sections 5097.5 and 30244	The code regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.
Warren-Alquist Act, PRC, section 25527	The Warren-Alquist Act requires the Energy Commission to “give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical, archaeological, and cultural sites.” With respect to paleontologic resources, the Energy Commission relies on guidelines from the Society for Vertebrate Paleontology (SVP), as indicated below.
California Environmental Quality Act (CEQA), PRC sections 21000 et seq.; CEQA Guidelines, Title 14, sections 15000 et seq., Appendix G	The Act and guidelines mandate that public and private entities identify the potential impacts on the environment during proposed activities. Appendix G outlines the requirements for compliance with CEQA and provides a definition of significant impacts on a fossil site.
Society for Vertebrate Paleontology (SVP), 1995	The “Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures” is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 by the SVP, a national organization of professional scientists.

Applicable Law	Description
Local	
2007 California Building Code	These codes, which are adopted at the county level, address excavation, grading, and earthwork construction, and are not limited to construction relating to earthquake safety and seismic activity hazards.
County of Stanislaus General Plan (2008),	Requires compliance with the safety element of the county general plan with regard to geologic hazards.
City of Ceres (1997)	Requires compliance with the safety element of the county general plan with regard to geologic hazards.

SETTING

The proposed A2PP project would involve construction of a 174-megawatt (MW) natural gas fired turbine generator power plant. The project would be located on approximately 4.6 acres adjacent to the existing 48 MW Turlock Irrigation District Almond Power Plant at 4500 Crows Landing Road in the City of Ceres, California. Construction would require installation of three natural gas fired turbine generators, a storm water retention basin, and a new natural gas pipeline. Three new above-ground transmission lines would transmit power to the grid via an existing substation. A 115kV line would be about 10 miles long and paralleled by a new 0.8-mile-long 69kV line near the existing Grayson substation. The third new transmission line, also 69kV, would extend north from the substation to the existing TID Almond Power Plant (STRC 2009). The new natural gas supply line would be nearly 12 miles along extending south from the site. Currently, a number of alternate routes are under consideration. The applicant has addressed these alignments in response to Energy Commission Data Requests 18, 77, 78, and 79 in what is, essentially, an addendum to the AFC (TID 2009; CH2M Hill 2009). Most ancillary facilities such as an anhydrous ammonia system, fire protection system, process water supply, and administration building already exist at the Almond Power Plant and would not be duplicated.

REGIONAL SETTING

The proposed A2PP site is located in central Stanislaus County, California approximately 30 miles east of the boundary between the Coast Ranges and the Great Valley (Central Valley) physiographic provinces. The Great Valley is approximately 400 miles long and 60 miles wide, bounded on the north by low-lying hills; on the northeast by the volcanic plateau of the Cascade Range; on the west by the Coast Ranges; on the east by the Sierra Nevada; and on the south by the Coast Ranges and the Tehachapi Mountains. The northern third of the valley is known as the Sacramento Valley, while the southern two-thirds are known as the San Joaquin Valley. The Great Valley is characterized by dissected uplands and relatively undeformed low alluvial plains and fans, river flood plains and channels, and lake bottoms. In the late Cenozoic era, much of the San Joaquin Valley was occupied by shallow brackish and freshwater lakes which left behind fine grained lakebed deposits surrounded by coarser sediments of fluvial and alluvial origin derived from the surrounding highlands. Much of the valley fill alluvium is underlain by marine and non-marine sedimentary rocks and crystalline basement that have undergone anticlinal and synclinal folding and faulting related to regional tectonism (USGS 1985). This tectonism has been uplifting and tilting the coast ranges since the middle Jurassic period (USGS 1991).

PROJECT SITE DESCRIPTION

The A2PP project would be located in Section 21, Township 4 South, Range 9 East of Mount Diablo Meridian at approximately 37.57 degrees north latitude by 120.99 degrees west longitude with a site elevation of approximately 80 feet above mean sea level (msl). The site slopes down to the west at an approximate grade of less than1%.

The site surface is composed of 6 or more feet of engineered fill which was imported to replace native soil removed during construction of an adjacent commercial building (TID 2009). Native soil in the project area consists of an unknown thickness of arkosic alluvial sand with silt and gravel associated with terraces and fan deposits of the Tuolumne River, and has been tentatively designated the m2-1 unit of the Pleistocene Modesto Formation (USGS 1980).

Based on previous geotechnical studies in the proposed site area, the ground water level beneath the site is expected to be approximately 20 feet (Kleinfelder 1993).

Several active and potentially active faults related to regional strike-slip faulting and compressional tectonics are present within 62 miles (100 kilometers) of the proposed A2PP site, and EQFAULT™ Version 3.00 was used to model these potential seismic sources (Blake 2006). The various faults are listed in **Geology and Paleontology Table 2**, along with the type, orientation (strike), maximum earthquake magnitude, and distance from the project site. The peak acceleration, fault type, and fault class for each fault is also given. The fault locations can be found on the California Division of Mines and Geology Fault Activity Map of California (CDMG 1994) and United States Geological Survey Fault Maps (USGS 2008b). The sense of movement and fault class were derived from the California Department of Conservation Fault Parameters (CDC 2002).

Geology and Paleontology Table 2
Active Faults Relative to the Proposed Almond 2 Power Plant Site

Fault Name	Distance from Site (miles)	Maximum Earthquake Magnitude (Mw)	Estimated Peak Site Acceleration (g)	Fault Type and Strike[1]	Fault Class
Great Valley 7	12.3	6.7	0.232	Reverse	B
Great Valley 8	13.2	6.6	0.209	Reverse	B
Ortigalita	26.1	7.1	0.134	Right lateral – Strike slip	B
Foothill Fault System 1	30.0	6.5	0.107	Normal - Right lateral – Oblique slip	C
Greenville (GS + GN)	30.5	6.9	0.109	Right lateral – Strike slip	B
Great Valley 9	32.3	6.6	0.106	Reverse	B
Greenville (GN)	37.7	6.7	0.080	Right lateral – Strike slip	B
Foothill Fault System 2	39.6	6.5	0.086	Normal - Right lateral – Oblique slip	C
Calaveras (CS + CC + CN)	42.3	6.9	0.085	Right lateral – Strike slip	B
Mount Diablo	44.3	6.7	0.086	Reverse	B
Calaveras (CN)	45.5	6.8	0.074	Right lateral – Strike slip	B
Foothill Fault System 3	46.2	6.5	0.077	Normal - Right lateral – Oblique slip	C
Hayward (HS + HN + RC)	47.7	7.3	0.092	Right lateral – Strike slip	A
Calaveras (CS)	47.9	5.8	0.042	Right lateral – Strike slip	B
Quien Sabe	49.0	6.4	0.057	Right lateral – Strike slip	B
Monte Vista – Shannon	52.6	6.7	0.077	Reverse - North	B
Great Valley 5	54.4	6.5	0.067	Reverse	B
Great Valley 10	54.8	6.4	0.064	Reverse	B
San Andreas (SAS + SAP + SAN + SAO)	57.2	7.9	0.112	Right lateral – Strike slip	A
Concord/GV (CON + GVS + GVN)	59.2	6.7	0.058	Right lateral – Strike slip	B
San Andreas (CREEPING)	59.3	6.2	0.044	Right lateral – Strike slip	A
Zayante – Vergeles	59.7	7.0	0.067	Right lateral – Strike slip - Reverse	B
San Andreas (SAP + SAN + SAO)	61.8	7.8	0.101	Right lateral – Strike slip	A

[1]All faults strike northwest unless otherwise noted.

MITIGATION

This section considers two types of impacts. The first is geologic hazards, which could impact the proper functioning of the proposed facility and create life/safety concerns. The second is the potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

No federal LORS concerning geologic hazards and geologic and mineralogic resources apply to this project. The California Building Standards Code (CBSC) and CBC (2007) provide geotechnical and geological investigation and design guidelines, which engineers must follow when designing a facility. As a result, the criteria used to assess the significance of a geologic hazard include evaluating each hazard's potential impact on the design and construction of the proposed facility. Geologic hazards include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, ubsidence, expansive soils, landslides, tsunamis, seiches, and others as may be dictated by site-specific conditions.

The California Environmental Quality Act (CEQA) guidelines, Appendix G, provide a checklist of questions that lead agencies typically address.

- Section (V) (c) includes guidelines that determine if a project will either directly or indirectly destroy a unique paleontological resource or site or a unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) focus on whether the project would expose persons or structures to geologic hazards.
- Sections (X) (a) and (b) concern the project's effects on mineral resources.

Staff has reviewed geologic and mineral resource maps for the surrounding area, as well as site-specific information provided by the applicant, to determine if geologic and mineralogic resources exist in the area and to determine if plant operations could adversely affect any such resources.

Staff reviewed existing paleontologic information and requested records searches from the University of California Museum of Paleontology (at Berkeley) for the area surrounding the site. Site-specific information generated by the applicant for the proposed A2PP site was also reviewed. All research was conducted in accordance with accepted assessment protocol (SVP 1995) to determine whether any known paleontologic resources exist in the general area. If such resources are present or likely to be present, conditions of certification outline required procedures to mitigate impacts to potential resources and are proposed as part of the project's approval.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Ground shaking, foundation settlement and expansive clay soils represent the main geologic hazards for this project. These potential hazards can be effectively mitigated through facility design by incorporating recommendations contained in a project-specific geotechnical report, as required by the CBC (2007). The requirements of the proposed **Facility Design** Conditions of Certification **GEN-1, GEN-5,** and **CIVIL-1** in the **Facility Design** section should also aid in mitigating these impacts to a less than significant level.

Near-surface geologic units at the proposed project site reportedly consist of at least 6 feet of imported fill overlying native clean to silty sand. These sands, in turn, overlie fine grained silty and clayey soils interbedded with silty and clayey sands and clean sands. The geologic units at the proposed site are widespread throughout the northwestern part of the San Joaquin Valley and, as such, are not unique in terms of recreational, commercial, or scientific value. In addition, the project area is not within an area of significant geologic resources according to the Stanislaus County General Plan (2008). Finally, staff reviewed existing documentation that outlines aggregate, oil, geothermal, and natural gas production in the area (CDOGGR 2008). The information provided by the applicant, and the independent documentation reviewed, indicate that the project should not impact, directly or indirectly, available geologic resources.

Paleontological collection sites including, one which yielded a fragment of mammoth tusk, are present in close proximity to the proposed A2PP site (UCMP 2009). Disturbed sediments and artificial fill, which form the surface at the site and are present along the

majority of the proposed linears, hold no potential to yield scientifically important fossils as they would be out of natural context from their environment of deposition. Proposed Conditions of Certification **PAL-1** through **PAL-7** are designed to mitigate direct impacts to potential paleontological resources below the disturbed zone, as discussed above, to less-than-significant levels. These conditions essentially require a worker education program in conjunction with the monitoring of earthwork activities by a qualified professional paleontologist (a paleontologic resource specialist, or PRS).

The proposed conditions of certification allow the Energy Commission's compliance project manager (CPM) and the applicant to adopt a compliance monitoring scheme ensuring compliance with LORS applicable to geologic hazards and the protection of geologic, mineralogic, and paleontologic resources.

Based on the information below, it is staff's opinion that the potential for significant adverse direct or indirect impacts to the project from geologic hazards and to potential geologic, mineralogic, and paleontologic resources from the proposed project is low, assuming the proposed conditions of certification are adopted and enforced.

GEOLOGICAL HAZARDS

The AFC (TID 2009) provides documentation of potential geologic hazards at the proposed plant site. Review of the AFC, coupled with staff's independent research, indicates that the possibility of geologic hazards impacting the plant site during its practical design life is low. Geologic hazards, such as strong ground shaking, expansive clay soils, liquefaction, and settlement due to loading compressible soils must be addressed in the project geotechnical report per CBC (2007) requirements.

Staff's independent research included the review of available geologic maps, reports, and related data of the proposed A2PP plant site. Geological information was available from the California Geological Survey (CGS), the California Division of Mines and Geology (CDMG), the United States Geological Survey (USGS), and other government organizations. Since 2002, the CDMG has been known as the CGS.

Faulting and Seismicity

Type A faults have slip-rates of ≥5 millimeters per year (mm/year) and are capable of producing an earthquake of magnitude 7.0 or greater. Type B faults have slip-rates of 2 to 5 mm per year and are capable of producing an earthquake of magnitude 6.5 to 7.0. Two Type A, 9 Type B faults, and 1 Type C faults and fault zones have been identified within 62 miles (100 kilometers) of the proposed A2PP Site. The fault type, potential magnitude, and distance from the site were summarized previously in **Geology and Paleontology Table 2**.

The Alquist-Priolo Act of 1973 and subsequent California state law (California Code of Regulations 2007) require that all occupied structures be set back 50 feet or more from the surface trace of an active fault. Since no active faults have been documented within or near the LEC site, setbacks from occupied structures would not be required.

Energy Commission staff reviewed the CDMG publication *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions*

(1994) and Alquist-Priolo Special Studies Zone mapping and reports (CDMG 2003; CGS 2002; and Hart and Bryant 1999). No active faults are shown on published maps as crossing the boundary of new construction at the proposed A2PP site or its proposed transmission routes. The nearest major active fault is the Segment 7 of the Great Valley Fault system located approximately 12 miles west of the project site (**Geology and Paleontology Table 2**). None of the proposed linears required by the project cross the Great Valley fault or other known faults.

Segment 7 of the Great Valley Fault has been mapped approximately 12 miles west of the proposed site and represents the highest potential for seismic impact to the site (**Geology and Paleontology Table 2**). This fault has been identified as a Type B reverse fault with 15 degree west dip and a slip rate of approximately 1.5 mm/year. The closest Type A fault from the site, the Hayward Fault, is mapped as being more than 47 miles west of the site and as having a slip rate of as much as 9.0 mm/year (CDC 2002).

Based on the geotechnical investigation performed for the adjacent Almond Power Plant project (Kleinfelder 1993), the site soil class is Class C. The estimated peak horizontal ground acceleration for the proposed A2PP site is 0.39 times the acceleration of gravity (0.39g) for a bedrock acceleration based on 2% probability of exceedence in 50 years and 2007 CBC criteria (USGS 2008a).

Liquefaction

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. The surficial fill layer at the proposed A2PP site is anticipated to be underlain by unsaturated clean sand which overlies bedded stiff to hard clay and silt soils interbedded with sand-dominated layers (Kleinfelder 1993). Standard penetration testing (SPT) conducted at the site indicate the subsurface formation is generally medium dense to very dense such that seismic shaking would be unlikely to cause widespread loss of shear strength (Kleinfelder 1993). However, loose sand layers are present which coupled with a shallow ground water table, could liquefy when subjected to strong earthquake shaking.

Based on the above information, the site and proposed linear alignments can be characterized as having some potential for liquefaction during a large earthquake; however, this potential impact can be mitigated to less than significant through facility design as required by the CBC (2007) proposed Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section.

Lateral Spreading

Lateral spreading of the ground surface can occur within liquefiable beds during seismic events. Lateral spreading generally requires an abrupt change in slope, such as a nearby steep hillside or deeply eroded stream bank, but can also occur on gentle slopes. Other factors such as distance from the epicenter, magnitude of the seismic event, and thickness and depth of liquefiable layers also affect the amount of lateral spreading. Although the proposed A2PP site and proposed linears may be subject to liquefaction, the potential for lateral spreading during seismic events is considered negligible since the proposed area is essentially flat.

Dynamic Compaction

Dynamic compaction of soils can occur 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. Loose sand layers which may underlie the proposed site could be subject to dynamic compaction during a large earthquake. The project-specific geotechnical report required by the CBC (2007) and proposed Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section will evaluate the dynamic compaction potential for the project, and provide recommendations to mitigate the effects of such conditions, if determined to be present, to a less than significant level.

Hydrocompaction

Hydrocompaction (also known as hydro-collapse) is generally limited to young soils that were deposited rapidly in a saturated state, most commonly by a flash flood. The soils dry quickly, leaving an unconsolidated, low density deposit with a high percentage of voids. Foundations built on these types of compressible materials can settle excessively, particularly when landscaping irrigation dissolves the weak cementation that is preventing the immediate collapse of the soil structure. Based on the density of the silt soils present beneath the proposed A2PP site, the site's agriculture history, and historic ground water elevations, the potential for hydrocompaction is considered to be negligible. The hydrocompaction potential along proposed project linears is not known but is expected to be minimal for the planned types of improvements.

Subsidence

Local subsidence or settlement may occur when areas containing compressible soils are subjected to foundation loads. Regional subsidence could occur due to future changes in ground water pumping or development of hydrocarbon reserves. No known subsidence problems exist in the proposed project area per the Stanislaus County General Plan (Stanislaus County 2008), and localized subsidence would likely only result from foundation loading during construction due to the presence of potentially compressible fine grain soils at depth across the site. Recommendations for mitigating the effects of subsidence due to foundation loads (settlement) must be provided in the project-specific geotechnical report as required by the CBC (2007) and proposed **Facility Design** Conditions of Certification **GEN-1**, **GEN-5,** and **CIVIL-1**. When necessary, mitigation is normally accomplished by over-excavation and replacement of the compressible soils for lightly loaded foundations. For heavily loaded foundations, deep foundations are commonly used to support the loads.

Expansive Soils

Expansive soils contain specific clay minerals with an affinity for water. When these soils are at a water content below their plastic limit, the addition of moisture from irrigation, precipitation, capillary tension, water line breaks, etc. causes the clay to absorb water molecules into their structure. This, in turn, causes an increase in the overall volume of the soil. This increase in volume can correspond to excessive movement (heave) of overlying structural improvements or settlement if the clay then

dries out. Plasticity index tests, which are an indicator of the expansive potential and clay content in soils, have not been performed on representative samples of the surficial clay soils at this site. Therefore, recommendations for mitigating the effects of expansive clays soils, if they are exposed during construction, must be provided in the project-specific geotechnical report as required by CBC (2007) requirements and proposed **Facility Design** Conditions of Certification **GEN-1**, **GEN-5,** and **CIVIL-1**. When necessary, mitigation is normally accomplished by over-excavation and replacement of the expansive soils beneath structural improvements, although deep foundations are commonly used where clays are thick and highly expansive. Lime treatment of the expansive soils is standard practice beneath pavements.

Landslides

The proposed A2PP site and surrounding area is relatively flat, exhibiting an approximate slope of 1% to the west. The flat-lying nature and the absence of topographically high ground within or immediately upgradient from the site suggest it is not susceptible to landslide activity.

Flooding

The Federal Emergency Management Agency (FEMA) has identified the proposed A2PP site as lying in an unshaded Zone X, or an area outside the 0.2% annual chance flood plain (FEMA 2008).

Tsunamis and Seiches

Tsunamis are large-scale, seismic sea waves caused by offshore earthquakes, landslides, and/or volcanic activity. Since the proposed A2PP site lies inland more than 100 miles from the Pacific Ocean, potential impacts to the site due to tsunamis are negligible. No large inland surface water bodies capable of producing seiches are located near the proposed plant site. Therefore, the potential for impacts to the proposed A2PP project due to seiche activity is negligible.

GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES

Based on mapping information developed by the CDC, the proposed A2PP site and associated linears lies within designated Mineral Resource Zone (MRZ) MRZ-3a$^{sg(C)}$ defined as “areas which may prove suitable for future sources of construction aggregate” (CDC 1993). Energy Commission staff has also reviewed applicable geologic maps and reports for this area (CDC 2006; CDC 1993; Stanislaus County 2008).

Exploration on the adjacent Almond Power Plant site did not indicate significant potential for aggregate or other economic mineral deposits (Kleinfelder 1993). Given the widespread availability of construction aggregate in Stanislaus County, there is little chance that construction of the proposed A2PP project would make important aggregate deposits unavailable for development. No natural gas, petroleum, or geothermal wells are reported within 5 miles of the proposed A2PP site (CDOGGR 2008).

Energy Commission staff has reviewed the paleontological resources assessment contained in the AFC (TID 2009). Staff has also conducted an independent search within the on-line records database maintained by the UCMP (2009). Paleontological collection sites have been recorded within close proximity of the proposed power plant. The 6 feet or more of fill, which forms the site surface, holds very little promise for production of scientifically significant fossil remains. Pleistocene sediments which underlie the fill have produced numerous fossils in the site vicinity. As a result, the potential to encounter paleontological resources during construction of the proposed project is high if excavations penetrate the full thickness of the fill. Potential impacts to such resources can be effectively mitigated through the Conditions of Certification **PAL-1** through **PAL-7**.

Construction Impacts and Mitigation

The design-level geotechnical investigation required for the proposed project by the CBC (2007) and proposed **Facility Design** Condition of Certification **GEN-1** will evaluate and provide standard engineering design recommendations for mitigation of liquefaction, dynamic compaction, excessive settlement due to compressible soils, and expansive clay soils, where appropriate.

No viable geologic or mineralogic resources are known to be present at the proposed plant site and are not expected to be present along the proposed transmission line or natural gas supply line routes. Fill materials have a negligible paleontological sensitivity. Construction of the proposed project will include grading, excavation, and utility trenching. Staff considers the probability of encountering paleontological resources to be high in excavations which penetrate through the surficial fill materials and encounter native Quaternary sediments. The potential for encountering fossils will increase with the depth of excavation/trenching.

Proposed Conditions of Certification **PAL-1** through **PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less-than-significant level. Essentially, these conditions require a worker education program in conjunction with monitoring of earthwork activities by qualified professional paleontologists (paleontologic resource specialists, or PRS). Earthwork is halted any time potential fossils are recognized by either the paleontologist or the worker. When properly implemented, the conditions of certification yield a net gain to the science of paleontology since fossils that would not otherwise have been discovered can be collected, identified, studied, and properly curated. The project owner retains a paleontological resource specialist to produce a monitoring and mitigation plan, conduct the worker training, and provide the on-site monitoring. During the monitoring, the PRS can and often does petition the Energy Commission for a change in the monitoring protocol. Most commonly, this is a request for reduced monitoring frequency after sufficient monitoring has been performed to ascertain that there is little chance of finding significant fossils. In other cases, the PRS can propose increased monitoring due to unexpected fossil discoveries or in response to repeated out-of-compliance incidents by the earthwork contractor.

Based upon the literature and archives search, and field surveys performed for the proposed A2PP project, the applicant has proposed monitoring and mitigation measures

to be followed during the construction of the project. Energy Commission staff believes that the facility, including the necessary linears, can be designed and constructed to minimize the effect of geologic hazards at the site during the project life and that impacts to any significant fossils encountered during construction of the power plant and associated linears would be mitigated to an acceptable level.

Operation Impacts and Mitigation

Operation of the proposed plant facilities should not have any adverse impact on geologic, mineralogic, or paleontologic resources. Potential geologic hazards, including strong ground shaking, dynamic compaction, expansive soils, and foundation settlement due to compressible soils can be effectively mitigated through facility design (see proposed Conditions of Certification **GEN-1, GEN-5,** and **CIVIL-1** in the **Facility Design** section) to the degree that these potential hazards should not affect operation of the facility.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts correspond to a proposed project's potential incremental effect, together with other closely related past, present, and reasonably foreseeable future projects whose impacts on geologic, mineralogic, and paleontologic resources may compound or increase the incremental effect of the proposed project on such resources.

Potential cumulative effects, as they pertain to geologic hazards, are essentially limited to regional subsidence due to ground water withdrawal. As this project would not involve pumping of large volumes of ground water, it would not contribute to any increase of this potential hazard.

No viable geologic resources have been identified in the vicinity of the project site (TID 2009).

Significant paleontological resources have been identified within close proximity to the proposed project site and its linears (UCMP 2009). Because the value of paleontological resources is associated with their discovery within a specific geologic host unit, the existing 6± feet of fill holds little prospect for production of scientifically significant fossil remains. Similarly, soils disturbed by plowing (the top 18 inches±), existing utility trenches or fills along proposed linears, would not yield significant fossils. The potential impacts to paleontological resources due to construction activities would be mitigated, as required by proposed Conditions of Certification **PAL-1** through **PAL-7**. Implementation of these conditions should result in a net gain to the science of paleontology by allowing fossils to be recovered, identified, studied, and preserved that would otherwise not have been discovered.

Based on the above discussion, staff believes that the potential for significant adverse cumulative impacts to the proposed project from geologic hazards during the project's design life is low and that the potential for impacts to geologic, mineralogic, and paleontologic resources is also low.

Based upon the literature and archives search, and field surveys performed for the proposed project, the applicant proposes monitoring and mitigation measures for

construction of the project. Energy Commission staff agrees with the applicant that the project can be designed and constructed to minimize the effects of geologic hazards at the site and that impacts to scientifically significant vertebrate and invertebrate fossils encountered during construction would be mitigated to acceptable levels.

The proposed conditions of certification allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme ensuring compliance with applicable LORS for geologic hazards and geologic, mineralogic, and paleontologic resources.

FACILITY CLOSURE

Facility closure activities are not expected to impact geologic or mineralogic resources since no such resources are known to exist at either the project location or along its proposed linears. In addition, the decommissioning and closure of the project should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed during plant decommissioning and closure would have been already disturbed, and mitigated as required, during construction and operation of the facility.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any agency or public comments regarding geologic hazards, mineral resources, or paleontology at this time.

CONCLUSIONS

The project will comply with applicable LORS, provided that the proposed conditions of certification are adopted and enforced. The design and construction of the project should have no adverse impact with respect to geologic, mineralogic, and paleontologic resources. Staff proposes to ensure compliance with applicable LORS through the adoption of the proposed conditions of certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

General conditions of certification with respect to engineering geology are proposed under Conditions of Certification **GEN-1, GEN-5,** and **CIVIL-1** in the **Facility Design** section. Proposed paleontological conditions of certification follow in **PAL-1** through **PAL-7**. It is staff's opinion that the likelihood of encountering paleontologic resources during plant and project linear construction is low. The upper 6 feet or more of the plant site is, reportedly, overlain by fill with almost no potential to bear significant fossils. Depending on finished pad grade, it is possible that most on-site structures will not penetrate the fill. The underlying native soils become increasingly more sensitive with depth. Native soils will likely be excavated for project linears and may be encountered in deeper plant site excavations or in areas of the plant site where fill may be thinner than 6 feet. Staff will consider reducing monitoring intensity, at the recommendation of the project PRS, following examination of the project grading plan or sufficient, representative, excavations to fully understand site stratigraphy.

PAL-1 The project owner shall provide the Compliance Project Manager (CPM) with the resume and qualifications of its Paleontological Resource Specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified Paleontological Resource Monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. institutional affiliations, appropriate credentials, and college degree;
2. ability to recognize and collect fossils in the field;
3. local geological and biostratigraphic expertise;
4. proficiency in identifying vertebrate and invertebrate fossils; and
5. at least three years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontologic Resource Monitors (PRMs) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or
- enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: (1) At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

(2) At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project, stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the

project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor's beginning on-site duties.

(3) Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction laydown areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and plan and profile drawings for the utility lines are appropriate for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or its linear facilities change, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following week and until ground disturbance is completed.

Verification: (1) At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.

(2) If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

(3) If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a paleontological resources monitoring and mitigation plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities, and may be modified with CPM approval. This document shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall reside

with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP 1995) and shall include, but not be limited to, the following:

1. assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;
2. identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the conditions of certification;
3. a thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. an explanation of why, how, and how much sampling is expected to take place and in what units, including descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;
5. a discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;
6. a discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;
7. a discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
8. procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;
9. identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation, and how they will be met, and the name and phone number of the contact person at the institution; and
10. a copy of the paleontological conditions of certification.

Verification: At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for the following workers: project managers, construction supervisors, forepersons and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of a CPM-approved video or in-person presentation. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontologic sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A WEAP certification of completion form signed by each worker indicating that he/she has received the training; and
7. A sticker that shall be placed on each worker's hard hat indicating that environmental training has been completed.

Verification: (1) At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP, including the brochure, with the set of reporting procedures for workers to follow.

(2) At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning to use a video for interim training.

(3) If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

(4) In the monthly compliance report (MCR), the project owner shall provide copies of the WEAP certification of completion forms with the names of those trained and the trainer or type of training (in-person or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.
2. The project owner shall ensure that the PRM(s) keeps a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or on the morning of the following business day in the case of a weekend or holiday event where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary will include the name(s) of PRS or PRM(s) active during the month; general descriptions of training and monitored construction activities; and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of

identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

Verification: The project owner shall maintain in his/her compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after project completion and approval of the CPM-approved paleontological resource report (see **PAL-7**). The project owner shall be responsible for paying any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submit it to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of ground-disturbing activities, including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

Certification of Completion
Worker Environmental Awareness Program
Almond 2 Power Plant (09-AFC-2)

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on cultural, paleontological, and biological resources for all personnel (such as construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
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Cultural Trainer: _____ Signature:_____ Date: ___/___/____

PaleoTrainer: _____ Signature:_____ Date: ___/___/____

Biological Trainer: _____Signature:_____ Date:___/___/_____

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POWER PLANT EFFICIENCY

Testimony of Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The TID Almond 2 Power Plant (A2PP), if constructed and operated as proposed, would generate a nominal 174 MW of peak electric power. While the project would consume substantial amounts of energy, with an overall project fuel efficiency of approximately 39% lower heating value (LHV) at nominal design load, it would do so in the most efficient manner practicable. The project would not require additional sources of energy supply, would not consume energy in a wasteful or inefficient manner, and would not create significant adverse impacts on energy supplies or resources.

INTRODUCTION

The Energy Commission makes findings as to whether energy use by A2PP would result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that A2PP's consumption of energy would create a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- examine whether the facility will likely present any adverse impacts upon energy resources;
- examine whether these adverse impacts are significant; and if so,
- examine whether feasible mitigation measures exist that would eliminate the adverse impacts or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

No federal, state or local/county laws, ordinances, regulations, and standards apply to the efficiency of this project.

SETTING

The Turlock Irrigation District (TID) proposes to construct a 174 MW (nominal net output) natural gas fired simple cycle electrical generating facility in Ceres, California. A2PP would provide electricity within the TID service territory.

The applicant intends to operate the plant's three GE LM6000PG SPRINT combustion turbine generators approximately 5,000 engine hours per year (total for all three combustion turbine generators), or an average of approximately 19% of the year per combustion turbine generator (TID 2009a, AFC § 2.1.7). Each combustion turbine

generator would utilize an inlet air evaporative cooler to maintain maximum output and efficiency at escalated temperatures. Natural gas would be transmitted to the plant via a new 11.6-mile long natural gas supply pipeline constructed and owned by PG&E to be connected to Pacific Gas & Electric Company (PG&E) Line #215 (TID 2009a, AFC §§ 1.1.1, 2.1, 2.1.4, 2.1.6)

ASSESSMENT OF IMPACTS

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE OF ENERGY RESOURCES

CEQA Guidelines state that the environmental analysis "…shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4[a][1]). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient, and unnecessary consumption of energy (Cal. Code Regs., tit. 14, § 15000 et seq., Appendix F).

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient, and unnecessary consumption of fuel or energy.

PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY

The natural gas requirement during base load operation at the annual average ambient temperature would be approximately 1,405 million British thermal units per hour (MMBtu/hr) LHV (TID 2009a, AFC § 2.1.6). This is a substantial rate of energy consumption and could potentially impact energy supplies (see below in **Additional Energy Supply Requirements**). Under expected project conditions, electricity would be generated at a thermal efficiency of approximately 39% LHV at full load operation (TID 2009a, AFC § Figure 2.1-3).

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

The applicant has described its sources of supply of natural gas for the project in the AFC (TID 2009a, AFC §§ 1.1.1, 2.1, 2.1.6). Natural gas for the A2PP would be supplied by a new 8- to 16-inch diameter natural gas transmission pipeline to be constructed, owned, operated and maintained by PG&E. The PG&E natural gas supply represents an adequate source for a project of this size; it is highly unlikely that the project could pose a significant adverse impact on natural gas supplies in California.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel would be supplied to the project by a new PG&E 8-in diameter high pressure pipeline (TID 2009a, AFC §§ 1.1.1, 2.1, 2.1.6). PG&E is a resource with adequate delivery capacity for a project of this size. There is no real likelihood that the A2PP would require the development of additional energy supply capacity.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the A2PP or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT, AND UNNECESSARY ENERGY CONSUMPTION

The A2PP could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient, or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

Project Configuration

The project objective is to provide additional peak electricity generation to the TID service territory to meet projected summer load. The applicant expects that the A2PP would mostly operate to meet peak demand and provide local reliability service. A simple cycle configuration is consistent with and supports this expectation due to its operating flexibility.

The A2PP would be configured as three simple cycle power trains in parallel, in which electricity is generated by one natural gas-fired turbine generator per train. This configuration, with its short start-up time and fast ramping[1] capability, is well suited to providing peaking power. Further, when reduced output is required, one or more of the turbine generators can be shut down, allowing the remaining machines to produce a percentage of the full power at optimum efficiency, rather than operating a single, larger machine at an inefficient part load output.

The applicant intends for this facility to operate in peaking duty up to a total of approximately 5000 engine hours for the three combustion turbine generators (an average of approximately 1,670 hours per turbine operating at full load). This is equivalent to each of the three turbines operating approximately 19% of the year (TID 2009a, AFC § 2.1.7).

Equipment Selection

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The applicant would employ three General Electric LM6000PG SPRINT (spray inter-cooling) gas turbine generators (TID 2009a, AFC § 1.1.1, 2.1). The LM6000PG SPRINT gas turbine to be employed in the A2PP represents one of the

[1] "Ramping" is increasing and decreasing electrical output to meet fluctuating load requirements.

most modern and efficient such machines now available. The SPRINT version of this machine is nominally rated at 53.5 MW and 39.8% efficiency LHV at ISO[2] conditions (GTW 2009). This rating slightly differs from the projected efficiency for the A2PP of 39% LHV because of efficiency losses from parasitic loads and increased flow losses due to the selective catalytic reduction units.

Efficiency of Alternatives to the Project

Alternative Generating Technologies

Alternative generating technologies for the A2PP are considered in the AFC (TID 2009a, AFC § 6.6). Fossil fuels (oil and coal), biomass, geothermal, hydroelectric, solar, and wind technologies are all considered. Biomass and fossil fuels other than natural gas cannot meet air quality limitations. Renewable technologies require larger physical areas and are not always available when peaking power is needed (see the **Project Alternatives** section of this document). Given the project objectives, location, and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel-efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of gas turbines, incorporating technological advances made in the development of aircraft (jet) engines, combined with the cost advantages of assembly-line manufacturing, has made available machines that not only offer the lowest available fuel costs, but at the same time sell for the lowest per-kilowatt capital cost.

The applicant plans to employ three General Electric LM6000PG SPRINT gas turbine generators (TID 2009a, AFC § 1.1, 2.1). The SPRINT version of this machine is nominally rated at 53.5 MW and 39.8% efficiency LHV at ISO[3] conditions (GTW 2009). (Staff compares alternative machines' ISO ratings as a common baseline, since project-specific ratings are not available for the alternative machines.) Alternative machines that can meet the project's objectives are the SGT-800 and FT8 TwinPac adapted from Siemens Power Generation and Pratt & Whitney aircraft engines, respectively.

The Siemens SGT-800 gas turbine generator in a simple cycle configuration is nominally rated at 47 MW and 37.5% LHV at ISO conditions (GTW 2009).

[2] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60% relative humidity, and one atmosphere of pressure (equivalent to sea level).

[3] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60% relative humidity, and one atmosphere of pressure (equivalent to sea level).

The Pratt & Whitney FT8 TwinPac gas turbine generator in a simple cycle configuration is nominally rated at 51.4 MW and 38.4% LHV at ISO conditions (GTW 2009).

Machine	Generating Capacity (MW)	ISO Efficiency (LHV)
GE LM6000PG SPRINT	**53.5**	**39.8 %**
Siemens SGT-800	47	37.5 %
P & W FT8 TwinPac	51.4	38.4 %

Source: GTW 2009

The LM6000PG SPRINT is further enhanced by the incorporation of spray intercooling (thus the name, SPRay INTercooling, or SPRINT). This takes advantage of the aeroderivative machine's two-stage compressor.[4] By spraying water into the airstream between the two compressor stages, the partially compressed air is cooled, reducing the amount of work that must be performed by the second stage compressor. This reduces the power consumed by the compressor, yielding greater net power output and higher fuel efficiency. The benefits in generating capacity and fuel efficiency increase with rising ambient air temperatures (GTW 2000).

While the LM6000 enjoys a slight advantage in fuel efficiency over the alternative machines, any differences among the three in actual operating efficiency would be relatively insignificant. Other factors such as generating capacity and ability to meet air pollution limitations are some of the factors considered in selecting the turbine model.

Inlet Air Cooling

A further choice of alternatives involves the selection of gas turbine inlet air-cooling methods.[5] The two commonly used techniques are the evaporative cooler, or fogger, and the chiller (mechanical or absorption); both techniques increase power output by cooling the gas turbine inlet air. In general terms, a mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler or a fogger boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ an evaporative cooler (TID 2009a, AFC §§ 1.1.1, 2.1, 2.1.4). Given the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach would yield no significant adverse energy impacts.

In conclusion, the project configuration (simple cycle) and generating equipment chosen appear to represent the most efficient feasible combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

[4] The larger industrial type gas turbines typically are single-shaft machines, with single-stage compressor and turbine. Aeroderivatives are two-shaft (or, in some cases, three-shaft) machines, with two-stage (or three-stage) compressors and turbines.

[5] A gas turbine's power output decreases as ambient air temperatures rise. The LM6000 SPRINT produces peak power at 50°F; this peak output can be maintained in much hotter weather by cooling the inlet air.

CUMULATIVE IMPACTS

No nearby projects have been identified that could potentially combine with the A2PP project to create cumulative impacts on natural gas resources. The PG&E natural gas supply system draws from extensive supplies originating in the Rocky Mountains, in the southwest, and in Canada, and is capable of delivering the required amount of gas to both of these projects. Therefore, staff believes the PG&E system is adequate to supply the A2PP without adversely impacting its other customers.

NOTEWORTHY PROJECT BENEFITS

The applicant expects the A2PP to help meet local electricity generation resource adequacy requirements in the TID service territory. By doing so in a fuel-efficient manner with GE LM6000 SPRINT gas turbines, one of the most modern and efficient such machines now available, the project would benefit electric consumers in California.

CONCLUSIONS

The project, if constructed and operated as proposed, would generate a nominal 174 MW of peaking electric power, at an overall project fuel efficiency of approximately 39% LHV at nominal design load. While it would consume substantial amounts of energy, it would do so in the most efficient manner practicable. It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the project would present no significant adverse impacts upon energy resources. No cumulative impacts on energy resources are likely.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

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POWER PLANT RELIABILITY

Testimony of Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The applicant predicts an equivalent availability factor of 92-98%, which staff believes is achievable. Based on a review of the proposal, staff concludes that the TID Almond 2 Power Plant (Almond 2) would be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No conditions of certification are proposed.

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability issues of the proposed Almond 2 to determine if the power plant is likely to be built in accordance with applicable laws, ordinances, regulations, and standards (LORS) and 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 the “Setting” subsection 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 applicable LORS and with typical industry norms for reliability of power generation. While Turlock Irrigation District (TID) has predicted an equivalent availability factor of 92-98% for Almond 2 (see below), staff uses typical industry norms as a benchmark, rather than TID’s projection, to evaluate the project’s reliability.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Although no federal, state, or local/county LORS apply to the reliability of this project, recently adopted laws and regulations influence the project’s operational requirements (see “Setting,” below).

SETTING

In the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the state’s control area operators, such as the California Independent System Operator (California ISO), that purchase, dispatch, and sell electric power throughout the state. Determining how the California ISO and other control area operators would ensure system reliability has been an ongoing process; protocols have been developed and put in place that allow sufficient reliability to be maintained under

the competitive market system. “Must-run” power purchase agreements and “participating generator” agreements, for example, are two mechanisms that have been employed to ensure an adequate supply of reliable power.

In September 2005, California AB 380 (Núñez, Chapter 367, Statutes of 2005) became law. This modification to the Public Utilities Code requires the California Public Utilities Commission to consult with the California ISO to establish resource adequacy requirements for all load-serving entities (basically, public and privately owned utility companies). These requirements include maintaining a minimum reserve margin (extra generating capacity to serve in times of equipment failure or unexpected demand) and maintaining sufficient local generating resources to satisfy the load-serving entity’s peak demand and operating reserve requirements.

In order to fulfill this mandate, the California ISO has begun to establish specific criteria for each load-serving entity under its jurisdiction. These criteria guide each load-serving entity in deciding how much generating capacity and ancillary services to build or purchase, after which the load-serving entity issues power purchase agreements to satisfy these needs. TID, as a load-serving entity, is obligated to satisfy these criteria which include increasing local generation to reduce reliance on imported power (TID 2009a, AFC § 1.1.1).

The California ISO’s mechanisms to ensure adequate power plant reliability apparently were devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there has been valid cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants were to exhibit individual reliability sufficiently lower than this historical level, the assumptions used by California ISO to ensure system reliability would prove invalid, with potentially disappointing results. Accordingly, staff has recommended that power plant owners continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

As part of its plan to provide needed reliability, the applicant proposes to operate a 174-MW (nominal output) simple cycle peaking load power plant, providing power to support local demand in the TID service territory (TID 2009a, AFC §§ 1.1.1, 1.4). Almond 2 is expected to achieve an equivalent availability factor of 92-98% (TID 2009a, AFC § 2.2.2.1). The project will be dispatched to serve peak loads at times of high demand, to provide local generation, and to achieve the TID’s required reserve margin.

ASSESSMENT OF IMPACTS

METHOD FOR DETERMINING RELIABILITY

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.

The equivalent availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability. Measures of power plant reliability are based on its actual ability to generate power when it is considered available and are affected by 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 (TID 2009a, AFC § 2.2.2.1), Almond 2 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 power plant will be as reliable as other power plants on the electric system and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction, and operation of the plant and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

The applicant describes a quality assurance/quality control program (TID 2009a, AFC §§ 2.2.2.5, 2.1.12.3) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs, and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the **Facility Design** section of this document.

PLANT MAINTAINABILITY

Equipment Redundancy

A peaking generating facility commonly offers adequate opportunity for maintenance work during its downtime; the applicant expects to operate Almond 2 approximately 5,000 machine-hours per year, or 19% of the year per machine (TID 2009a, AFC § 2.1.7). During periods of extended dispatch, however, as could occur if other major generating or transmission assets were disabled, the facility may be required to operate for extended periods. A typical approach for achieving reliability in such circumstances is to provide redundant examples of those pieces of equipment most likely to require service or repair.

The applicant plans to provide appropriate redundancy of function for the project. The fact that the project consists of three combustion turbine-generator sets operating in parallel as independent equipment trains provides inherent reliability. A single equipment failure cannot disable more than one train, thus allowing the plant to continue to generate (at reduced output). In addition, all plant ancillary systems are also designed with adequate redundancy to ensure continued operation in the face of equipment failure (TID 2009a, AFC § 2.2.2.2; Table 2.2-1). Staff believes that equipment redundancy will be sufficient for a project such as this.

Maintenance Program

The applicant proposes to establish a preventive plant maintenance program typical of the industry (TID 2009a, AFC §§ 2.2.2, 2.2.2.5.2). 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

Almond 2 will burn natural gas supplied by Pacific Gas & Electric Company (PG&E). Fuel will be delivered via a new 11.6-mile-long natural gas pipeline that will connect to PG&E's Line #215 south of the project site. PG&E has confirmed that its system has enough capacity to supply Almond 2 from this location (TID 2009a, AFC §§ 2.1.6, 2.2.2.3). A will serve letter from PG&E, confirming this, is included as Appendix 2C of the AFC. The PG&E natural gas system represents a resource of considerable capacity and offers access to adequate supplies of gas. Staff agrees with the applicant's prediction (TID 2009a, AFC § 2.2.2.3) that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

Almond 2 would obtain water for plant use from the City of Ceres Waste Water Treatment Plant (WWTP) via an existing 6-inch diameter pipeline. Water would be pumped from an extraction well located beneath the WWTP percolation ponds approximately 35 to 65 feet below ground level. Potable water will be provided by a drinking water delivery service (TID 2009a, AFC §§ 2.1.7.1, 5.15.1.4.1).
A will-serve letter from the City of Ceres WWTP is included in Appendix 2 A of the AFC. Staff believes this source yields sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see the **Soil and Water Resources** section of this document.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves), and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but seismic shaking (earthquake) and flooding may present credible threats to reliable operation.

Seismic Shaking

There is potential for seismic ground shaking to affect the project site and linear facilities in the event of a large-magnitude earthquake occurring on fault segments near the project. The project site and linear facilities, however, are not located within an Alquist-Priolo Earthquake Fault Zone or within the trace of any known active fault. (For more information, see the **Geology and Paleontology** section of this document.) The project will be designed and constructed to the seismic requirements of the latest appropriate LORS (TID 2009a, AFC § 5.4.6).

Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see the **Facility Design** section of this document. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

Flooding

The site lies within Zone X floodplain as defined by the Federal Emergency Management Agency, which is outside of the 100-year flood plain(TID 2009a, AFC § 5.15.1.3). With proper plant design (ensured by adherence to the proposed **Facility Design** conditions of certification), staff believes there should be no significant concerns with power plant functional reliability due to flooding. For further discussion, see the **Soil and Water Resources** and **Geology and Paleontology** sections of this document.

COMPARISON WITH EXISTING FACILITIES

The North American Electric Reliability Corporation (NERC) keeps industry statistics for availability factors (as well as many other related reliability data). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System and periodically summarizes and publishes the statistics on the Internet (http://www.nerc.com). NERC reports the following summary generating unit statistics for the years 2002 through 2006 (NERC 2007):

- for Gas Turbine units (50 MW and larger):

  Equivalent Availability Factor = 91.82%

The gas turbines that will be employed in the project have been on the market for several years; General Electric has documented typical annual availability for this machine of 97.8%. The applicant's prediction of an annual availability factor approaching 92-98% (TID 2009a, AFC § 2.2.2.1) appears reasonable compared to General Electric's experience. In fact, these new machines can well be expected to outperform the fleet of various (mostly older) gas turbines that make up the NERC statistics. Further, since the plant will consist of three parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures. 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 follow industry norms, and staff believes they are likely to yield an adequately reliable plant.

NOTEWORTHY PROJECT BENEFITS

The applicant would provide peaking power and intermediate duty generation to serve the needs of the TID, to provide additional local generating capacity and to offer ancillary services to the CAISO (TID 2009a, AFC § 2.1.15). The fact that the project consists of three combustion turbine generators configured as independent equipment trains provides inherent reliability. A single equipment failure cannot disable more than one train, thus allowing the plant to continue to generate (at reduced output). In light of this and the additional reliability-enhancing features of the project described above, the applicant's prediction of an equivalent availability factor approaching 92-98% appears achievable. Staff believes this should provide an adequate level of reliability.

CONCLUSION

TID predicts an equivalent availability factor approaching 92-98%, which staff believes is achievable. Based on a review of the proposal, staff concludes that the plant would be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No conditions of certification are proposed.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

TID 2009a –Turlock Irrigation District/ R. Baysinger (tn: 51502). Application for Certification, Volume 1& 2. Dated 5/11/09. Submitted to CEC/Docket Unit on 5/11/09.

McGraw-Hill 1994 - McGraw-Hill Energy Information Services Group. Operational Experience in Competitive Electric Generation, an Executive Report, 1994.

NERC 2007 - North American Electric Reliability Corporation. 2002–2006 Generating Availability Report, November 8, 2007.

TRANSMISSION SYSTEM ENGINEERING

Testimony of Laiping Ng and Mark Hesters

SUMMARY OF CONCLUSIONS

The proposed Almond 2 Power Plant (A2PP) project outlet transmission lines and terminations are acceptable and would comply with all applicable laws, ordinances, regulations, and standards (LORS). The project interconnection to the grid would not require additional downstream transmission facilities (other than those proposed by the applicant) that require California Environmental Quality Act (CEQA) review.

- The A2PP will not cause any new transmission line overloads under normal or contingency conditions. Pre-project transmission line overloads under contingency conditions would be mitigated by Turlock Irrigation District (TID) operation procedures. Therefore, there are no adverse impacts to the transmission system that require mitigation as a result of integrating the A2PP project into the TID system.
- Three 69 kV circuit breakers may need to be replaced to accommodate A2PP. The rest of the existing breakers are adequate to withstand the post project incremental fault currents described in the Short Circuit Study.
- The proposed interconnecting facilities between the new generator and the proposed TID Grayson Substation, including the step-up transformer, the 115 kV overhead transmission line, and terminations are adequate, and planned in accordance with good utility practices, and acceptable to staff in accordance with engineering LORS.

INTRODUCTION

STAFF ANALYSIS

This Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conform to all applicable LORS required for safe and reliable electric power transmission. Additionally, under the 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 Regs, tit 14, §15378). Therefore, the Energy Commission must identify the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are required for interconnection and that represent the "whole of the action."

Energy Commission staff relies on the interconnecting authority, in this case the TID, for the analysis of impacts on the transmission grid from the proposed interconnection as well as the identification and approval of new or modified downstream facilities that may be required as mitigation measures. The proposed A2PP would connect to the TID transmission network and requires analysis and approval by TID.

Because TID is not part of the California Independent System Operator (California ISO) grid, the California ISO is not directly responsible for ensuring electric system reliability

for the generator interconnection and does not plan to provide analysis and testimony for this project. The staff therefore has increased responsibility to evaluate the system reliability impacts of the project and provide conclusions and recommendations to the Energy Commission.

Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant.

ROLE OF TURLOCK IRRIGATION DISTRICT

TID is responsible for ensuring electric system reliability in its system for addition of the proposed transmission modifications and determines both the standards necessary to achieve reliability and whether the proposed transmission modifications conform to those standards.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

California Public Utilities Commission General Order 95, *Rules for Overhead Electric Line Construction*, formulates uniform requirements for construction of overhead transmission lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, and operation or use of overhead electric lines and to the public in general.

California Public Utilities Commission General Order 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 Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Corporation (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority, and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage, and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on section I. A. of the standards, entitled *NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table,* and on section I. D., entitled *NERC and WECC Standards for Voltage Support and Reactive Power*. These standards require that the results of power flow and stability simulations verify defined

performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage, and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, its uncontrolled loss is not permitted (WECC 2002).

NERC Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles, and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. While these reliability standards are similar to NERC/WECC standards, certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards with regard to power flow and stability simulations for transmission system contingency performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).

PROJECT DESCRIPTION AND INTERCONNECTION FACILITIES

The Almond 2 Power Plant is a simple-cycle power generating facility that would be located in City of Ceres, Stanislaus County, California. A total of three combustion turbine generators (CTG), expected to generate 174 MW, would be interconnected to the TID's new Grayson Substation. The proposed commercial operation date for the facility is the fourth quarter of 2011.

Each combustion turbine generator is rated at 68 MVA with a power factor of 0.85. The CTG would connect through a 4,000 Amps generator circuit breaker and 15 kV underground cable to the low side of its dedicated 50/67/83 MVA generator step-up (13.8/115 kV) transformer. The high side of the transformer would be connected through a 1200 Amps disconnect switch to the project switchyard (TID2009a, section 1.3, section 2.0, Figure 3.1-3A).

SWITCHYARDS AND INTERCONNECTION FACILITIES

In a ring bus configuration, the project switchyard consists of five 1,200 A circuit breakers and ten 1,200 A disconnect switches. Two 115 kV overhead generator tie-lines connecting from the project switchyard to the new TID Grayson Substation will be 0.9 mile and 1.2 miles in length, respectively. The proposed conductor size is 954 kcmil aluminum alloy. The proposed Grayson Substation consists of 12 kV, 69 kV, and 115 kV buses. The originally designed 115 kV bus would need to be expanded to accommodate A2PP's two generator tie-lines. Generator tie-line 1 would connect to the expanded 115 kV bus, and generator tie-line 2 would connect to the originally designed 115 kV bus. The generator tie-lines would be supported by single and double wood or steel pole structures. Power would be distributed to the grid via transmission lines from the Grayson Substation (TID2009a, section 3.2, Figure 3.1-3B, Figure 3.1-4A). Conditions of Certification TSE-5 ensure these facilities comply with LORS.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility and control area operator, TID in this case, is responsible for ensuring grid reliability. The entity determines the transmission system impacts of the proposed project, and any mitigation measures needed to ensure system conformance with performance levels required by utility reliability criteria, NERC planning standards, and WECC reliability criteria. The System Impact Study (SIS) is used to determine the impacts of the proposed project on the transmission grid. Staff relies on this study to determine the project's effect on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards.

The SIS analyzes the grid with and without the proposed project under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which grid reliability is determined. The study must analyze the impact of the project for the first year of operation and thus are based on a forecast of loads, generation, and transmission. Load forecasts are developed by the interconnecting utility and the California ISO. Generation and transmission forecasts are established by an interconnection queue. The 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.

If the SIS shows that the interconnection of the project causes the grid to be out of compliance with reliability standards, then the studies will identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. If the mitigation identified by the interconnecting utility includes transmission modifications or additions that require CEQA review as part of the "whole of the action," the Energy Commission must analyze the environmental impacts of these modifications or additions.

SYSTEM IMPACT STUDY

The System Impact Study was performed to identify the transmission system impacts caused by the A2PP project on TID and the neighboring utilities including Modesto Irrigation District (MID), Merced Irrigation District (MeID), Sacramento Municipal Utility District (SMUD), Pacific Gas and Electric Company (PG&E), and Western Area Power Administration (WAPA) transmission systems. The SIS includes Power Flow analysis, Transient Stability analysis, Voltage Stability analysis, and Short Circuit analysis. The study modeled the A2PP for a maximum net output of 174 MW. The base cases included planned generating facilities in TID, PG&E, MID, and MeID, and SMUD service territories, whose on-line schedules are concurrent with or precede the A2PP project. The detailed study assumptions have been described in the SIS. The Power Flow analysis was conducted with and without the A2PP connected to the TID transmission system at the new Grayson Substation using full loop-base cases modeling projected 2012 summer peak, 2012 summer off-peak, and 2012 spring peak conditions in Central Valley area. The Power Flow analysis assessed the project's impact on thermal loading and voltage deviation of the transmission lines and equipment. Transient Stability

analysis was conducted with the A2PP using the projected 2012 summer peak full loop base case to determine whether the A2PP would create instability in the system following certain selected outages. Voltage Stability analysis was conducted to determine the voltage drop caused by selected outages and how close the system is from collapse for selected contingencies based on reactive limit. Short Circuit analysis was conducted with and without the A2PP to determine if the A2PP would result in overstressing existing substation facilities (CH2MHILL2009i**,** System Impact Study).

Power Flow Study Results and Mitigation Measures

Power Flow

The SIS concluded that after the 2.9 mile-long Almond-Crows Landing 69 kV single circuit transmission line has been re-rated from the 2 feet per second wind speed to 4 feet per second wind speed, the Power Flow analysis identified no project overload criteria violations under 2012 summer peak, 2012 summer off-peak, and 2012 spring peak normal operation conditions. Marginal transmission line overloads under contingency conditions would be mitigated by operation procedures. No mitigation is required for the A2PP.

Under Normal (Category A) conditions:

- The Power Flow Study indicated the addition of the A2PP would not cause any new overloads or exacerbate any existing overloads under normal operating conditions. No mitigation is required for the A2PP.

Under N-1 (Category B) contingency conditions:

- Walnut – WEC 115 kV line #1: This line is loaded to 90% before the addition of the A2PP. Addition of the A2PP will increase the line loading to 100.68% under Category B contingency condition.

  Mitigation:

  - No mitigation is required for this line overload. This overload occurs only during summer off-peak conditions and with the Almond CT turned on. Once the Almond CT was modeled off line, as the unit is expected to operate during peak load condition only, this marginal line overload did not appear as shown in Table V-3 of the System Impact Study. No mitigation is required for the A2PP.

Under N-2 (Category C) contingency conditions:

- Walnut – WEC 115 kV line #1: This line is loaded to 90% before the addition of the A2PP. Addition of the A2PP will increase the line loading to 102.68% under Category C contingency conditions.

  Mitigation:

  - No mitigation is required for this line overload. This overload occurs only during summer off-peak conditions and with the Almond CT turned on. Once the Almond CT was modeled off line, this marginal line overload did not appear as shown in Table V-3 of the System Impact Study. No mitigation is required for the A2PP.

- Grayson – Westport 69 kV line: This line is loaded to 90% before the addition of the A2PP. Addition of the A2PP will increase the line loading to 105.09% under Category C contingency conditions.

  Mitigation:

  - No mitigation is required for this line overload. This overload occurs only during summer off-peak conditions and with the Almond CT turned on. Once the Almond CT was modeled off line, this marginal line overload did not appear as shown in Table V-3 of the System Impact Study. No mitigation is required for the A2PP.

The System Impact Study also identified some pre-project transmission line overloads under N-2 contingency conditions in the 2012 summer peak case when the McClure generation unit was modeled off. However, the McClure generation unit is normally on during summer peak. Once the McClure generation unit is on, no pre-project or post-project overloads occurred as shown in Table V-5.

Appendix 8 of the System Impact Study lists Power Flow thermal analysis output for all the study cases including 2012 Spring Peak, 2012 Summer Peak, 2012 Summer Off-Peak, and 2012 Summer Off-Peak Sensitivity. The Power Flow thermal analysis concluded that the addition of the A2PP to the TID grid would not cause adverse impacts to the transmission system.

Voltage Stability

Voltage Stability analysis was performed using the 2012 Spring Peak, 2012 Summer Peak, and 2012 Summer Off-Peak cases. The study results indicated that the interconnection of the A2PP would not cause adverse impacts to the existing TID transmission system. Adding the A2PP to the TID system would improve the TID's reactive margin by 32 Mvar and would increase the load handling capability by 214 MW.

Transient Stability Analysis Results and Mitigation Measures

Transient Stability analysis for A2PP was conducted using the projected 2012 summer peak full-loop base case to determine if the A2PP would create any adverse impacts on the stable operation of the transmission grid following selected N-1 and N-2 outages. The results indicate there are no adverse impacts on the stable operation of the transmission system following the selected disturbances, as outlined in the SIS for integration of the A2PP (CH2MHILL2009i,System Impact Study).

Short Circuit Analysis Results and Mitigation Measures

Short Circuit analysis was conducted to determine the degree to which the addition of the A2PP project increases fault duties at TID's substations, adjacent utility substations, and other 500 kV, 230 kV, 115 kV, and 69 kV busses within the study area. The analysis simulated faults at selected busses. The maximum three phase and single line-to-ground fault currents, with and without the project, and breaker duty information for each of these busses are summarized in Appendix 13 of the SIS (Short Circuit Analysis Output). The Short Circuit analysis indicated that with the A2PP, three circuit breakers CB 510, CB 530, and CB 550 at the Walnut 69 kV Substation exceeded the 27,000 Ampere interrupting capability in the single line-to-ground fault analysis. These three

circuit breakers may require upgrade. The applicant has provided the Short Circuit analysis to PG&E, MID and WAPA to review the study results. No comments have been received to date. Additional circuit breaker upgrades are not anticipated.
The existing breakers are adequate enough to withstand any post project incremental fault currents identified in the Short Circuit analysis (CH2MHILL2009i, System Impact Study, Appendix 13).

CUMULATIVE IMPACTS

The TSE analysis focuses on whether or not a proposed project will meet required codes and standards. At all times the transmission grid must remain in compliance with reliability standards, whether one project or many projects interconnect. Potential cumulative impacts on the transmission network are identified through the utility generator interconnection process. This process analyzes not only the impacts of the proposed project but also all other projects ahead of the studied project in the generation interconnection queue. In cases where a significant number of proposed generation projects could affect a particular portion of the transmission grid, the interconnecting utility can study the cluster of projects in order to identify the most efficient means to interconnect all the proposed projects. It is apparent from the System Impact Study results that impacts of other projects in the generation queue require mitigation and that the interconnection of the A2PP does not require significant mitigation beyond that needed for other projects.

COMPLIANCE WITH LORS

The System Impact Study indicates that the project interconnection would comply with NERC/WECC planning standards. The applicant will design, build, and operate the proposed 115 kV overhead transmission line. The proposed modifications to the Grayson Substation would be done by TID. Staff concludes that with implementation of the proposed conditions of certification, the project will meet all applicable LORS.

CONCLUSIONS AND RECOMMENDATIONS

The proposed A2PP project outlet transmission lines and terminations are acceptable and would comply with all applicable LORS. The project interconnection to the grid would not require additional downstream transmission facilities (other than those proposed by the applicant) that require CEQA review.

- The A2PP will not cause any new transmission line overloads under normal or contingency conditions. Pre-project transmission line overloads under contingency conditions would be mitigated by TID operation procedures. Therefore, there are no adverse impacts to the transmission system that require mitigation as a result of integrating the A2PP project into the TID system.
- Three 69 kV circuit breakers may need to be replaced to accommodate A2PP. The rest of the existing breakers are adequate to withstand the post project incremental fault currents described in the Short Circuit Study.

- The proposed interconnecting facilities between the new generator and the proposed TID Grayson Substation, including the step-up transformer, the 115 kV overhead transmission line, and terminations are adequate, and planned in accordance with good utility practices, and acceptable to staff in accordance with engineering LORS.

PROPOSED CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall furnish to the Compliance Project Manager (CPM) and to the Chief Building Official (CBO) a schedule of transmission facility design submittals, a master drawing list, a master specifications list, and a major equipment and structure list. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a master drawing list, and a master specifications list to the CBO and 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 **TRANSMISSION SYSTEM ENGINEERING Table 1** 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.

TRANSMISSION SYSTEM ENGINEERING 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 civil engineer;
- a geotechnical engineer, or a civil engineer experienced and knowledgeable in the practice of soils engineering;

- 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
- 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 of CERTIFICATION GEN-5**, may be responsible for design and review of the TSE (Transmission System Engineering) facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. be responsible for the electrical design of the power plant switchyard, outlet, and termination facilities; and

2. sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action (pursuant to 2001 California Building Code, chapter 1, section 108.4; chapter 17, section 1701.3; appendix chapter 33, section 3317.7). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line, and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable laws, ordinances, regulations, and standards (LORS). The following activities shall be reported in the monthly compliance report:

- receipt or delay of major electrical equipment;
- testing or energizing of major electrical equipment; and
- the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of 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 shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

1. The A2PP project will be interconnected to the new TID Grayson Substation via two new 115 kV overhead transmission lines, approximately 0.9 mile and 1.2 miles in length, respectively with 954 kcmil aluminum alloy, Magnolia conductor or conductors with higher ratings.
2. The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of California Public Utilities

Commission General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code of Regulations; articles 35, 36 and 37 of the High-Voltage Electric Safety Orders; National Electric Code (NEC); and related industry standards.

3. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
4. 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.
5. The project conductors shall be sized to accommodate the full output from the project.
6. Termination facilities shall comply with applicable TID interconnection standards.
7. A request for minor changes to the facilities described in this condition may be allowed if the project owner informs the CBO and CPM and receives approval for the proposed change. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agreed to by the project owner and CBO), the project owner shall submit the following to the CBO for approval.

1. The project owner shall submit design drawings, specifications and calculations conforming with California Public Utilities Commission General Order 95 or National Electric Safety Code; Title 8 of the California Code of Regulations; articles 35, 36, and 37 of the High Voltage Electric Safety Orders; National Electric Code; and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment.
2. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on worst-case conditions,[1] and a statement signed and sealed by the registered engineer in charge, or other acceptable alternative verification, that the transmission element(s) will conform with California Public Utilities Commission General Order 95 or National Electric Safety Code; Title 8 of the California Code of Regulations, articles 35, 36, and 37 of the High-Voltage Electric Safety Orders; National Electric Code and related industry standards.
3. The project owner shall submit electrical one-line diagrams signed and sealed by the registered professional electrical engineer in charge, a route map, an engineering description of equipment, and the configurations covered by requirements 1 through 7 in **CONDITION OF CERTIFICATION TSE-5** above.

[1] Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

4. Letters from PG&E, MID, and WAPA stating that the TID Short Circuit Study had been reviewed for existing interrupting capability with the integration of the A2PP.

   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 that may not conform to the facilities described in this condition, and shall request approval to implement such changes.

TSE-6 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 California Public Utilities Commission General Order 95 or National Electric Safety Code, Title 8 of the California Code of Regulations, articles 35, 36, and 37 of the High Voltage Electric Safety Orders, National Electric Code and related industry standards. In case of nonconformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such nonconformance, and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

1. "As built" engineering description(s) and one-line drawings of the electrical portion of the transmission facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with California Public Utilities Commission General Order 95 or National Electric Safety Code; Title 8 of the California Code of Regulations; articles 35, 36, and 37 of the High Voltage Electric Safety Orders; National Electric Code Standards; and related industry standards;
2. an "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portions 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"; and
3. a summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

REFERENCES

CH2MHILL2009i – CH2MHILL/S. Madams (tn: 53901). Data Response Set 1C – Responses to CEC Staff Data Requests 61b, 68 & 72. Dated 10/30/09. Submitted to CEC/Docket Unit on 10/30/09.

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WECC (Western Electricity Coordinating Council). 2002. NERC/WECC Planning Standards, August 2002.

DEFINITION OF TERMS

AAC — All aluminum conductor.

ACSR — Aluminum conductor steel-reinforced.

ACSS — Aluminum conductor steel-supported.

Ampacity — Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.

Ampere — The unit of current flowing in a conductor.

Bundled — Two wires, 18 inches apart.

Bus — Conductors that serve as a common connection for two or more circuits.

Conductor — The part of the transmission line (the wire) that carries the current.

Congestion management — A scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.

Double–contingency condition — Also known as emergency or N-2 condition, a forced outage of two system elements usually (but not exclusively) caused by one single event. Examples of an N-2 contingency include loss of two transmission circuits on a single tower line or loss of two elements connected by a common circuit breaker due to the failure of that common breaker.

Emergency overload — See single–contingency condition. This is also called an N-1 condition.

kcmil — One-thousand circular mil. A unit of the conductor's cross-sectional area divided by 1,273 to obtain the area in square inches.

Kilovolt (kV) — A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.

Loop — An electrical cul-de-sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection, and returns it back to the interrupted circuit, thus forming a loop or cul-de-sac.

Megavar — One megavolt ampere reactive.

Megavars — Mega-volt-ampere-reactive. One million volt-ampere-reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA)
: A unit of apparent power equal to the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW)
: A unit of power equivalent to 1,341 horsepower.

N-0 condition
: See normal operation/normal overload.

Normal operation/normal overload (N-0)
: When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 condition
: See single–contingency condition.

N-2 condition
: See double–contingency condition.

Outlet — Transmission facilities (e.g., circuit, transformer, circuit breaker) linking generation facilities to the main grid.

Power flow analysis
: A power flow analysis is a forward-looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers, and other equipment and system voltage levels.

Reactive power
: Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial action scheme (RAS)
: A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6 — Sulfur hexafluoride is an insulating medium.

Single–contingency condition
: Also known as emergency or N-1 condition, occurs when one major transmission element (e.g., circuit, transformer, circuit breaker) or one generator is out of service.

Solid dielectric cable
: Copper or aluminum conductors that are insulated by solid polyethylene-type insulation and covered by a metallic shield and outer polyethylene jacket.

Special protection scheme/system (SPS)
: An SPS detects a transmission outage (either a single or credible multiple contingency) or an overloaded transmission facility and then trips or runs back generation output to avoid potential overloaded facilities or other criteria violations.

Switchyard
: A power plant switchyard is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating
: See ampacity.

TSE
: Transmission System Engineering.

Tap
: A transmission configuration creating an interconnection through a sort single circuit to a small- or medium-sized load or generator. The new single circuit line is inserted into an existing circuit by using breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing
: A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild
: A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Testimony of Suzanne Phinney, D.Env.

SUMMARY OF CONCLUSIONS

In the analysis of the Almond 2 Power Plant (A2PP), no significant environmental issues were identified. As the A2PP would be sited adjacent to the existing 48-MW Almond Power Plant on industrial land (brownfield) and would capitalize on shared facilities, an analysis of alternative sites is not required under the Warren-Alquist Act. However, staff determined that an evaluation of alternative sites would provide comparative information. Three alternative project sites were examined. The alternative sites in the vicinity have disadvantages (e.g. longer gas and transmission interconnections, non-disturbed locations, greater visual presence, closer to receptors) and no advantages over the proposed site.

Staff does not believe that alternative technologies such as solar, wind, geothermal, biomass, tidal, and wave present feasible alternatives to the proposed project. The alternative linear routes are feasible but present no clear advantage. With no significant issues at this time, staff does not recommend an alternative over the project as proposed.

Staff also believes that the “no project” alternative is not superior to the proposed project. The “no project” scenario could lead to increased operation of existing plants (and reliance on older, more polluting technology) or development of new plants on undeveloped (greenfield) land. In addition, conservation and demand side management programs would likely not meet the state’s growing electricity needs that could be served by the A2PP.

Therefore, as the A2PP would not have any significant impacts, staff does not recommend an alternative site, generation technology, or configuration over the project proposed by Turlock Irrigation District.

INTRODUCTION

This section considers potential alternatives to the construction and operation of the proposed Almond 2 Power Plant (A2PP). The purpose of this alternatives analysis is to provide an analysis of a reasonable range of feasible alternatives which 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). Although staff has not identified any potentially significant impacts of the proposed project, this section analyzes different technologies and alternative sites that may reduce or avoid concerns raised by interested parties during the siting process. Staff has also analyzed the impacts that may be created by locating the project at alternative sites.

The Energy Commission does not have the authority to approve an alternative or require Turlock Irrigation District (TID) to move the proposed project to another location,

even if it identifies an alternative site that meets the project objectives and avoids or substantially lessens one or more of any significant effects of the project. Implementation of an alternative site would require that the Applicant submit a new Application for Certification (AFC), including revised engineering and environmental analysis; this more rigorous AFC-level analysis of any of the alternative sites could reveal environmental impacts, non-conformity with laws, ordinances, regulations, and standards; or potential mitigation requirements that were not identified during the more general alternatives analysis presented herein.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

TID proposes to site the A2PP adjacent to the existing Almond Power Plant (A1PP). As specified in the Warren-Alquist Act, sections 25523 and 25525, the California Energy Commission must find that a project complies with all applicable laws, ordinances, regulations, and standards (LORS). In addition, the Energy Commission generally acts the Lead Agency under the California Environmental Quality Act (CEQA) for purposes of licensing thermal power plants.

CEQA

Energy Commission staff is required by agency regulations to examine the "feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment." (Cal. Code Regs., tit. 20, § 1765).

The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations, section 15126.6(a), requires 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, subd. (e).) The analysis should identify and compare the impacts of the various alternatives, but analysis of alternatives need not be in as much detail as the analysis of the proposed project.

The range of alternatives is governed by the "rule of reason," which requires consideration only of those alternatives necessary to permit informed decision making and public participation. CEQA states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative. (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(3).) However, if the range of alternatives is defined too narrowly, the analysis may be inadequate. (City of Santee v. County of San Diego (4th District 1989) 214 Cal. App.3d 1438.)

WARREN-ALQUIST ACT

The Warren-Alquist Act provides clarification as to when it may not be reasonable to require an applicant to analyze alternative sites for a project. An alternative site analysis

is not required as part of an AFC when a natural gas-fired thermal power plant is (1) proposed for development at an existing industrial site, and (2) “the project has a strong relationship to the existing industrial site and therefore it is reasonable not to analyze alternative sites for the project.” (Pub, Res. Code § 25540.6, subd. (b).) Staff believes that the A2PP site –located at an existing industrial site and sharing facilities with the A1PP – satisfies both criteria. However, staff determined that an evaluation of alternative sites would provide comparative information to interested parties.

PROJECT DESCRIPTION AND SETTING

TID proposes a 174 MW natural gas-fired simple-cycle peaking facility in Stanislaus County within the city limits of Ceres. The A2PP would consist of three 58-MW General Electric LM6000PG SPRINT combustion turbine generators (CTGs) and associated equipment, including selective catalytic reduction (SCR) and oxidation catalyst emission control systems.

The A2PP would be situated on a 4.6-acre parcel adjacent to the existing A1PP. The site is bordered by the A1PP to the south, a WinCo distribution warehouse to the west, a farm supply facility to the north, and various industrial facilities to the east. The TID Lower Lateral 2, an irrigation canal, and adjacent transmission lines are south of the A1PP. The site is located 2 miles south of the Ceres city center, and approximately 0.3 miles south of the nearest residential uses. The site is zoned for industrial use and there are several tall industrial structures nearby. The project site was previously used as a borrow pit and was filled and graded in 2008.

The A2PP would interconnect to the TID system via two 115-kilovolt (kV) lines (Corridor 1, 0.9 miles long, and Corridor 2, 1.2 miles long) to the proposed Grayson Substation. Natural gas would be provided via an approximately 11.6-mile-long gas pipeline that runs south along Carpenter Road. The line would connect to Pacific Gas and Electric (PG&E) Line #215. A 1.8-mile-long reinforcement segment of Line #215 would also be required, for a 13.4-mile-long total gas pipeline requirement.

The A2PP would require about 293 acre-feet of water per year (AFY) to be supplied by process water provided by the City of Ceres Wastewater Treatment Plant (WWTP). The water will be accessed through an existing pipeline in the utility corridor connecting the A1PP and the WWTP. Service water for domestic use would be provided by an existing well on the A1PP site. Potable drinking water would be delivered to the site. Project wastewater would be collected in a sump and pumped to the existing wastewater tank on the A1PP site and from there returned to the WWTP through an existing pipeline (TID2009a, Section 2.0).

Shared infrastructure with the A1PP would include the following:

- Anhydrous ammonia system, including 12,000 gallon tank
- Fire protection system, including fire water storage tank
- Well water for service water and emergency shower/eyewash
- Water treatment system

- Recycled water supply and wastewater discharge systems
- Process water system
- Instrument and service air systems
- Oil/water separator
- Demineralized and reverse osmosis water storage tanks
- Administration building

DETERMINING THE SCOPE OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternative analysis is to determine the potential significant impacts of the A2PP and then focus on alternatives that are capable of reducing or avoiding these impacts.

To prepare this alternative analysis, staff used the methodology summarized below:

- Describe the basic objectives of the project.
- Identify any potential significant environmental impacts of the project.
- Identify and evaluate alternative locations or sites to determine whether the environmental impacts of the alternatives are the same, better, or worse than the proposed project.
- Identify and evaluate technology alternatives to the project which would mitigate impacts.
- Evaluate the impacts of not constructing the project to determine whether the "no project" alternative is superior to the project as proposed.

In considering site alternatives, staff determined a reasonable geographical area. Since alternatives must consider the underlying objectives of the proposed project, staff confined the geographic area for site alternatives to the TID service area and within reasonable proximity of transmission lines and reclaimed water. These location alternatives are generally consistent with TID's objectives and siting criteria:

- Location within TID service territory and consistency with general plans and zoning ordinances;
- Proximity to reclaimed water service, transmission, and gas connections; and
- Ability to have no significant impact on the environment.

Alternative generation technologies, as discussed in this analysis, include both methods to reduce the demand for electricity and alternative methods to generate electricity.

BASIC OBJECTIVES OF THE PROJECT

After studying TID's AFC (TID2009a, p. 6-2), Energy Commission staff has determined the A2PP objectives to be:

- Providing fast starting, load-following peaking generation to meet TID's current operating and reliability needs, to firm intermittent renewable resources and to meet future load growth.
- Installing new generating capacity at site that can use existing TID assets and power plant infrastructure.
- Generating electric power at a location that enhances the economic base within TID territory and reduces regional dependence on imported power.
- Safely producing electricity without creating significant environmental impacts.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT

Staff has not identified any potential significant environmental impacts associated with the construction of the A2PP.

SITE ALTERNATIVES TO THE PROJECT

This section evaluates the alternatives sites identified by TID. Staff has determined that the applicant-identified sites provide a range of reasonable alternative locations and therefore staff has not identified additional sites.

Staff considered the following criteria in reviewing potential alternative sites:

1. Avoid or substantially lessen one or more of the potential significant effects of the project; and
2. Satisfy the following criteria:
    a. Site suitability. Approximately 5 acres are required for the site at its proposed location. Additional acreage (1-2 acres) would be required if the project was not able to share existing infrastructure. The shape of the site also affects its usability;
    b. Availability of infrastructure. The site should be within a reasonable distance of transmission, natural gas, and water connections. Lengthy infrastructure would increase the potential for environmental impacts;
    c. Brownfield or already developed site;
    d. Compliance with general plan designation and zoning district; and
    e. Availability of the site.

SITES IDENTIFIED FOR FURTHER EVALUATION

In the AFC (TID2009a, p. 6-7), the Applicant identified three sites within the TID service territory. For all sites, acquisition would be required, as TID does not have ownership. Staff used aerial imagery, property information, and the AFC and data responses (TID2009a, Section 6.3.2; CH2MHILL 2009k), and conducted a drive-by of parcels on January 13, 2010 to analyze the alternative sites.

The alternative sites are shown on **Alternatives Figure 1**. Since proximity to transmission lines and reclaimed water are important considerations for assessing alternative sites, these are also shown on the figure.

TID Alternative Site 1

TID Alternative Site 1 (TID Alt. #1) is located southwest of Ceres, 100 yards to the southwest of Fulkerth and Vivian roads. The approximately 8-acre site is on undeveloped land owned by the City of Modesto. Surrounding uses are alfalfa fields to the south and west, and the Modesto WWTP to the northeast. The site is zoned for agriculture; a power plant would be consistent with the zoning but would require a use permit. The closest noise receptors (residences) are approximately 0.25 miles to the north.

Water for a project at this site would be provided from the Modesto (Jennings) WWTP via a new 1.0 mile pipeline. Wastewater would be returned to the Modesto WWTP or treated through a zero-liquid discharge (ZLD) system. The site would require two new 9-mile transmission line interconnections to the Walnut Substation. Installation of a new 6-mile-long pipeline would be required in order to connect with PG&E's Line #215 located along Bradbury Road.

A comparison of the TID Alt. #1 site with the A2PP site follows:

- **Linears.** TID Alt. #1 would require 8-mile longer transmission lines, a 7.4-mile shorter gas pipeline, and a 1-mile longer water pipeline.
- **Air Quality.** TID Alt. #1 is located within the same air basin (San Joaquin Valley Air Basin) and the type and quantity of air emissions would be similar to the A2PP. However, the need for an emergency diesel fire pump (versus sharing a pump with the A1PP) could slightly increase emissions. Receptors would be closer at this site.
- **Biological Resources.** Biological impacts would be overall greater at this site because of the close proximity of wetland and riparian habitat to the south, east, and west, which leads directly to the San Joaquin River. The soils onsite however are whitish and alkaline and the site supports little natural biological habitat.
- **Cultural Resources.** A records search of the Central California Information Center, California Historical Resources Information System (CHRIS) did not identify any known/recorded cultural resources within a 0.5 mile radius of the A2PP or any of the alternative sites. Although the TID Alt. #1 site has not been surveyed, cultural resource impacts would likely be greater given the site's proximity to the San Joaquin River and location above the flood plain.
- **Geological Resources and Hazards.** Effects of the project on geological resources and hazards are expected to be minimal and would be similar to the A2PP site.
- **Hazardous Materials.** Hazardous material handling would be similar. However, locating the project adjacent to the A1PP would reduce the number of deliveries of anhydrous ammonia in the general area. The 2-lane roads leading to site could increase the potential for truck accidents.
- **Land Use and Agriculture.** The TID Alt. #1 site is designated and zoned for agriculture and would have to meet the requirements of a use permit in order to

locate a power plant at this site. The site does not have a Williamson Act contract nor is it on prime agricultural land. Although the soils at the site are too alkaline to support farming, adjacent soils are classified as Prime.

- **Noise.** A project located at the TID Alt. #1 location would be about 280 feet closer to the nearest residence. Because of its rural agricultural setting, a power plant would add a dominant noise source.
- **Paleontology.** Paleontological resources are not likely to be impacted at the A2PP site and any of the alternative sites.
- **Public Health.** Public health impacts could be greater at this site due to the need for a diesel fire pump and the additional deliveries of anhydrous ammonia on 2-lane roads.
- **Socioeconomics.** Local socioeconomic impacts to the region would be similar, although locating a project at TID Alt. #1 would result in a few more jobs since the A2PP would share staffing resources with the A1PP.
- **Soils.** Impacts to soil resources are expected to be similar to the A2PP site.
- **Traffic and Transportation.** The A2PP site and the alternative sites are all accessible from Highway 99 and Interstate 5. However, the TID Alt. #1 site is not directly off collector boulevards and would require more travel on 2-lane roads.
- **Visual Resources.** The TID Alt. #1 site would create greater visual impacts due to its agricultural setting. An 8-mile longer transmission line, adjacent to predominately agricultural land, would also be more visible. In contrast, the A2PP is within an industrial area and is screened from view by adjacent facilities.
- **Water Resources.** The TID Alt. #1 site would require delivery of recycled water from the Modesto WWTP via a new 1-mile pipeline (running east along Monte Vista Avenue and south on Vivian Road to the site). Additional water treatment or design changes (e.g., ZLD system) may be required at this site if concentrations of total dissolved solids (TDS) or nitrates were too high. If the Modesto WWTP did not accept process wastewater from the plant, onsite treatment and offsite disposal may be required.
- **Waste Management.** Similar quantities of waste would be generated at all the alternative sites in comparison to the A2PP. However, if additional water treatment is required at the TID Alt. #1 site, the quantity of waste requiring offsite disposal would increase.
- **Worker Safety.** No differences are expected with respect to worker safety at the A2PP site and the alternative sites.

TID Alternative Site 2

This 40-acre site is located on the western edge of Turlock, on the west side of Washington Road and just south of West Main Avenue. TID's 49.9 MW Walnut peaking plant is located just to the north, and the 250 MW Walnut Energy Center is located approximately 0.25 miles to the east. The site is zoned for agricultural use and is currently farmed. Industrial land with several tall structures is nearby. The nearest residences are located on the 40-acre site, approximately 800 feet west of the project.

Water for a project at this site would be provided from the Turlock WWTP via a new 2.0 mile pipeline. Wastewater would be treated through a ZLD system. Transmission interconnection would be less than 0.1 mile. Installation of a new 3.7-mile-long pipeline would be required in order to connect with PG&E's Line #215 located along Bradbury Road.

A comparison of the TID Alt. #2 site with the A2PP site follows:

- **Linears.** TID Alt. #2 would require 1-mile longer transmission lines, a 9.7-mile shorter gas pipeline, and a 2-mile longer water pipeline.
- **Air Quality.** TID Alt. #2 is located within the same air basin (San Joaquin Valley Air Basin) and the type and quantity of air emissions would be similar to the A2PP. However, the need for an emergency diesel fire pump (versus sharing a pump with the A1PP) could slightly increase emissions. Receptors would be closer at this site.
- **Biological Resources.** Biological impacts would be similar at this site since it is actively farmed and supports little natural biological habitat.
- **Cultural Resources.** A CHRIS records search did not identify any known/recorded cultural resources within a 0.5 mile radius of the A2PP or any of the alternative sites. Cultural resource impacts would be similar at this site since it is actively farmed and surface soils have been graded, harrowed, and planted.
- **Geological Resources and Hazards.** Effects of the project on geological resources and hazards are expected to be minimal and would be similar to the A2PP site.
- **Hazardous Materials.** Hazardous material handling would be similar. However, locating the project adjacent to the A1PP would reduce the number of deliveries of anhydrous ammonia in the general area.
- **Land Use and Agriculture.** The TID Alt. #2 site is zoned for agriculture. It is designated as Prime Farmland but does not have a Williamson Act contract. Locating a power plant at the TID Alt. #2 site would require rezoning.
- **Noise.** A project located at the TID Alt. #2 would be about 780 feet closer to the nearest residences. Although this site is in a rural agricultural-industrial setting, a power plant would increase noise levels to nearby receptors.
- **Paleontology.** Paleontological resources are not likely to be impacted at the A2PP site and any of the alternative sites.
- **Public Health.** Public health impacts could be greater at this site due to the need for a diesel fire pump and the additional deliveries of anhydrous ammonia.
- **Socioeconomics.** Local socioeconomic impacts to the region would be similar although locating a project at TID Alt. #2 would result in a few more jobs since the A2PP would share staffing resources with the A1PP.
- **Soils.** Impacts to soil resources are expected to be similar to the A2PP site.
- **Traffic and Transportation.** The A2PP site and the alternative sites are all accessible from Highway 99 and Interstate 5. Traffic accessing the TID Alt. #2 site would require crossing the Tidewater Southern Railroad line; however, the spur is used infrequently and has crossing arms.

- **Visual Resources.** The TID Alt. #2 site would have slightly greater visual impacts than the A2PP due to its visibility to travelers along Washington Road and West Main Avenue and its proximity to residences. Only a very short (200 foot) transmission interconnection would be required, further limiting visual impacts.
- **Water Resources.** The TID Alt. #2 site would require delivery of recycled water from the Turlock WWTP via a new 2-mile pipeline. The use of a ZLD system would be required, which would increase waste production as compared to the A2PP.
- **Waste Management.** Similar quantities of waste would be generated at all the alternative sites in comparison to the A2PP. However, additional water treatment required at the TID Alt. #2 site would increase the quantity of waste requiring offsite disposal.
- **Worker Safety.** No differences are expected with respect to worker safety at the A2PP site and the alternative sites.

TID Alternative Site 3

This 18.7-acre site is located in Ceres, northeast of the junction of Morgan Road and East Whitmore Avenue. The site is bordered by a storage yard to the north, vacant industrial-designated land to the east, a residential subdivision to the south, and unincorporated agricultural land to the west. The majority of the site, which is vacant land, is designated General Industrial. A portion of the site adjacent to Whitmore Avenue is addressed by a specific plan (PC-29). The nearest residence is located about 300 feet to the south.

Water for a project at this site would be provided from the Ceres WWTP via a new 2.0 mile pipeline. Wastewater would be treated through a ZLD system. Interconnection would be less than 0.1 mile. Installation of a new 3.7-mile-long pipeline would be required in order to connect with PG&E's Line #215 located along Bradbury Road.

A comparison of the TID Alt. #3 site with the A2PP site follows:

- **Linears.** TID Alt. #3 would require 2-mile longer transmission lines, a 1.9-mile shorter gas pipeline, and a 1.5-mile longer water pipeline.
- **Air Quality.** TID Alt. #3 is located within the same air basin (San Joaquin Valley Air Basin) and the type and quantity of air emissions would be similar to the A2PP. However, the need for an emergency diesel fire pump (versus sharing a pump with the A1PP) could slightly increase emissions. Receptors would be much closer at this site.
- **Biological Resources.** The TID Alt. #3 site is located in close proximity to industrial, residential, and agricultural development which would limit impacts to biological resources. However, as identified in the AFC (TID2009a, page 6-10), a preliminary site assessment identified California ground squirrels at this alternative site, which could indicate the presence of burrowing owl.
- **Cultural Resources.** A CHRIS records search did not identify any known/recorded cultural resources within a 0.5 mile radius of the A2PP or any of the alternative sites. Cultural resource impacts would be similar at this site, since it is in a predominately industrial area with residential development occurring within the past 20 years.

- **Geological Resources and Hazards.** Effects of the project on geological resources and hazards are expected to be minimal and would be similar to the A2PP site.
- **Hazardous Materials.** Hazardous material handling would be similar. However, locating the project adjacent to the A1PP would reduce the number of deliveries of anhydrous ammonia in the general area.
- **Land Use and Agriculture.** The TID Alt. #3 site is zoned for general industrial development and includes a specific plan for the portion of the site adjacent to Whitmore Avenue. The site is disturbed due to surrounding land uses and while vacant, is essentially a weedy, fallow field. Impacts would be similar to the A2PP
- **Noise.** A project located at the TID Alt. #3 would be about 1,280 feet closer to the nearest residence (which is located 300 feet to the north). A power plant would add a dominant noise source.
- **Paleontology.** Paleontological resources are not likely to be impacted at the A2PP site and any of the alternative sites.
- **Public Health.** Public health impacts could be greater at this site due to the need for a diesel fire pump and the additional deliveries of anhydrous ammonia. Residences are much closer at this location.
- **Socioeconomics.** Local socioeconomic impacts to the region would be similar although locating a project at TID Alt. #3 would result in a few more jobs since the A2PP would share staffing resources with the A1PP. Both the A2PP site and TID Alt. Site #3 are located in Ceres and would contribute to a small increase in sales tax to the city.
- **Soils.** Impacts to soil resources are expected to be similar to the A2PP site.
- **Traffic and Transportation.** The A2PP site and the alternative sites are all accessible from Highway 99 and Interstate 5. Traffic and transportation impacts would be similar at this site.
- **Visual Resources.** Although the TID Alt. #3 site is bordered on the north and east by industrial uses and by agricultural land to the west, a power plant at this location would be very visible to a residential neighborhood to the south. It would increase the industrial character of the area. The need for 2-mile longer transmission lines would further increase visual resource impacts as compared to the A2PP.
- **Water Resources.** The TID Alt. #3 site would require delivery of recycled water from the Ceres WWTP, similar to the A2PP, although a new 1.5-mile pipeline would be required. Wastewater would be sent back to the Ceres WWTP and thus would avoid the need for a ZLD system, as would the A2PP.
- **Waste Management.** Similar quantities of waste would be generated at all the alternative sites in comparison to the A2PP.
- **Worker Safety.** No differences are expected with respect to worker safety at the A2PP site and the alternative sites.

Alternatives Table 1 compares the approximate lengths of linears (transmission line, gas pipeline and water/sewer lines) required for the proposed and the three alternative sites. The distances to sensitive receptors and schools are also shown.

Alternatives Table 2 shows how the impacts of the three alternative sites compare to impacts of the A2PP site.

ALTERNATIVES Table 1
Comparison of Approximate Length of Linears/Distance to Receptors

	A2PPSite	TID Alternative Site 1	TID Alternative Site 2	TID Alternative Site 3
Transmission Line Length	2 lines, 0.9 miles & 1.2 miles	2 lines, 9 miles long	2 lines, 0.1 mile	2 lines, 3.2 miles
Gas Pipeline Length	13.4 miles	6 miles	3.7 miles	11.5 mile
Water/Sewer Connections	Adjacent	1 mile	2 miles	1.5 miles
Distance to Sensitive Receptors	1,580 feet	1,300 feet	800 feet	300 feet
Distance to Schools	1.4 miles	3.2 miles	1.7 miles	0.44 miles

ALTERNATIVES Table 2
Comparison of Impacts of Alternatives to the Proposed A2PP *

Issue Area	TID Alternative Site 1	TID Alternative Site 2	TID Alternative Site 3
Environmental Assessment			
Air Quality	Slightly greater than proposed site	Slightly greater than proposed site	Greater than proposed site
Biological Resources	Greater than proposed site	Similar to proposed site	Greater than proposed site
Cultural Resources	Greater than proposed site	Similar to proposed site	Similar to proposed site
Hazardous Materials	Greater than proposed site	Slightly greater than proposed site	Slightly greater than proposed site
Land Use and Agriculture	Slightly greater than proposed site	Greater than proposed site	Similar to proposed site
Noise and Vibration	Greater than proposed site	Greater than proposed site	Greater than proposed site
Public Health	Slightly greater than proposed site	Slightly greater than proposed site	Slightly greater than proposed site
Socioeconomic Resources	Similar to proposed site	Similar to proposed site	Similar to proposed site
Soil and Water Resources	Slightly greater than proposed site	Slightly greater than proposed site	Similar to proposed site
Traffic and Transportation	Slightly greater than proposed site	Similar to proposed site	Similar to proposed site

Issue Area	TID Alternative Site 1	TID Alternative Site 2	TID Alternative Site 3
Visual Resources	Greater than proposed site	Similar to proposed site	Greater than proposed site
Waste Management	Slightly greater than proposed site	Slightly greater than proposed site	Similar to proposed site
Worker Safety	Similar to proposed site	Similar to proposed site	Similar to proposed site
Engineering Assessment			
Geology, Mineral Resources, and Paleontology	Similar to proposed site	Similar to proposed site	Similar to proposed site
Transmission System Engineering	Similar to proposed site	Similar to proposed site	Similar to proposed site

*Shaded cells identify impacts greater than the proposed project

GENERATION TECHNOLOGY ALTERNATIVES

CONSERVATION AND DEMAND SIDE MANAGEMENT

Conservation and demand-side management consist of a variety of approaches to reduction of electricity use, including energy efficiency and conservation, building and appliance standards, and load management and fuel substitution. In 2005 the Energy Commission and the California Public Utilities Commission's (CPUC) Energy Action Plan II declared cost-effective energy efficiency as the resource of first choice for meeting California's energy needs. The Energy Commission noted that energy efficiency helped flatten the state's per capita electricity use and saved consumers more than $56 billion since 1978 (CPUC 2008). The investor-owned utilities' 2006-2008 efficiency portfolio marks the single-largest energy efficiency campaign in U.S. history, with a $2 billion investment by California's energy ratepayers (CPUC 2008). However, with population growth, increasing demand for energy, and the need to reduce greenhouse gases, there is an even greater need for energy efficiency.
The CPUC, with support from the Governor's Office, the Energy Commission, and the California Air Resources Board, among others, adopted the California Long-Term Energy Efficiency Strategy Plan for 2009 to 2020 in September 2008 (CPUC 2008). The plan is a framework for all sectors in California including industry, agriculture, large and small businesses, and households. Major goals of the plan include:

- All new residential construction will be zero net energy by 2020;
- All new commercial construction will be zero net energy by 2030;
- Heating, ventilation, and air conditioning industries will be re-shaped to deliver maximum performance systems;
- Eligible low-income customers will be able to participate in the Low Income Energy Efficiency program and will be provided with cost-effective energy efficiency measures in their residences by 2020.

Conservation and demand-side management are important for California's energy future and cost effective energy efficiency is considered as the resource of first choice for meeting California's energy needs. However, with population growth and increasing

demand for energy, conservation and demand-management alone are not sufficient to address all of California's energy needs.

RENEWABLE ENERGY ALTERNATIVES

Staff also considered renewable energy sources. Although viable, these technologies do not have the quick start-up and shut-down capabilities for peaking power needs as does the A2PP. They would not be able to meet TID's reliability needs and operational constraints at other locations limit their effectiveness as alternatives to the A2PP.

- **Solar.** Solar thermal technology – including parabolic trough, power tower, and Stirling engine – converts the sun's energy to heat for utilization by conventional generator equipment. Land requirements can be extensive, and range from 4-5 acres per MW for solar trough to 5-10 acres/MW for power tower. Water use can range from around 10 acre-feet per year (AFY) per 100 MW) to several hundred AFY/100 MW (NRDC and Sierra Club 2008).

  With photovoltaic (PV) technology, semiconductors directly convert sunlight to electricity. Unlike solar thermal, PV does not require water for electricity generation, although some water (2-10 AFY/100 MW) is required to clean panels. Utility-scale PV requires level land on the order of approximately 4 acres/MW of capacity for crystalline silicon, and more acreage for thin film and tracking technologies (NRDC and Sierra Club 2008).

  Solar facilities are suitable in the A2PP general area. Stanislaus County supervisors recently approved negotiating periods for two potential solar facilities in the county: a solar energy farm at the former Greer Road landfill and a solar farm next to the Fink Road landfill (Modesto Bee 2009).

  Rooftop PV is an option to minimize land requirements. For example, in Southern California, Southern California Edison has installed over 3 MW of distributed solar energy on over 1 million square-foot commercial roof using thin film PV technology. This is part of a planned installation of 3.5 million PV panels that would generate 250 MW of capacity (SCE 2009).

  NCI (2007) calculated Stanislaus County's economic potential for retrofitting[1] commercial and residential buildings using state subsidies and new business models favoring PV development. The report identified a total of 1 MW potential by 2010 and 2 MW potential by 2016. These values are in contrast to 61 MW in 2010 and 253 MW in 2016 identified for Los Angeles. Rooftop PV development in the near future in Stanislaus County, even with economic incentives, would be significantly less than the 174MW generation capacity of the proposed project.

- **Wind.** Wind carries kinetic energy that can be utilized to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current (AC) into the utility grid. Wind turbines currently being manufactured have power ratings ranging from 250 watts to 3.0 MW (AWEA 2009). Land use requirements average 5.4 acres/MW (CEC 2008), although the turbine footprints only occupy 2-5% of the area (AWEA 2009). Environmental impacts include bird and bat collisions and visual

[1] Economic potential of new construction was essentially zero.

pollution. Stanislaus County ranks poorly in terms of California wind potential; only 3% of the county is in wind class 2-7 and the total acres in wind class 2-7 (28,750) are 0.1% of the total acreage in the state within wind class 2-7 (24,029,276) (AWEA 2003).

- **Geothermal.** Steam or high-temperature water from geothermal reservoirs is harnessed to drive steam turbine/generators. Geothermal plants range in size from under 1 MW to 110 MW, and require 0.2 to 0.5 acre/MW. Geothermal plants provide highly reliable base-load power, with capacity factors from 90 to 98%. Plants, however, must be built near geothermal reservoir sites, as steam and hot water cannot be transported long distances without significant thermal energy loss. There are no known geothermal resources in Stanislaus County (CEC 2005).
- **Biomass.** Electricity is generated by burning organic fuels in a boiler to produce steam, which then turns a turbine. Biomass can also be converted into a fuel gas such as methane and burned. Major biomass fuels include forestry and mill wastes, agricultural field crop and food processing wastes, and construction and urban wood wastes. Biomass facilities do not require an extensive amount of land, but only produce small amounts of electricity (in the range of 3 to 10 MW). Ongoing truck deliveries would be required to supply the plant with the biomass fuel, which would increase air emissions.
- **Tidal and Wave.** Tidal generation of electricity involves building a dam, known as a barrage, across a bay or estuary. Water retained behind a dam at high tide produces a power head sufficient to generate electricity as the tide ebbs and water released from within the dam turns conventional turbines. A dam across the San Joaquin River would be damaging to fish populations and have other significant environmental impacts. Meanwhile, wave energy technologies - which include terminator devices, point absorbers, attenuators, and overtopping devices – extract energy from surface wave motion or subsurface pressure fluctuations (MMS 2007). Wave energy is applicable to portions of the California coast, but not to inland areas within the TID service territory.

ALTERNATIVE CONFIGURATIONS

The A2PP is located adjacent to the A1PP and the location of plant components would allow the two facilities to share infrastructure. Therefore, staff did not consider alternative configurations of the A2PP.

ALTERNATIVE LINEAR ROUTES AND WATER SUPPLY OPTIONS

The A2PP would require two 115-kv transmission corridors, one approximately 0.9 miles long and one approximately 1.2 miles long. Both lines would connect to the Grayson Substation. The Applicant identified three alternative transmission routes, of varying distances between 0.8 miles to 1.6 miles long. The alternate transmission routes did not pose any advantages over the proposed routes.

Natural gas would be supplied by an approximately 11.1-mile-long gas pipeline connecting to PG&E Line #215. The Applicant identified an alternative natural gas pipeline route of 9.1 miles, also connecting to PG&E Line #215. The alternate natural gas pipeline route does not pose any advantages over the proposed route.

Reclaimed water would be supplied from the Ceres WWTP and would tie in to the water pipeline that currently serves the A1PP. As alternative locations for reclaimed water would be at a significant distance, staff did not consider alternative water supply sources.

THE "NO PROJECT" ALTERNATIVE

The "no project" alternative under CEQA assumes that the 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 decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." (Cal. Code Regs., tit. 14, § 15126.6, subd. (1).) 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, subd. (e)(2).) CEQA Guidelines and Energy Commission regulations require consideration of the "no project" alternative. The no-action alternative is compared to the effects of constructing the proposed project. In short, the impacts associated with the new power plant would not occur at this site if the project does not go forward.

Selection of the "no project" alternative would render all concerns about project impact moot. The "no project" alternative would preclude any construction or operation and, thus, grading of the site or installation of new foundations, piping, or utility connections. If the project were not built, the region would not benefit from the local and efficient source of 174 MW of new generation that this facility would provide nor would jobs be created in support of project construction and operation. The primary advantages of the A2PP project are that it would utilize a previously disturbed site and would capitalize on existing infrastructure at the A1PP site. As noted above, the A2PP project would also increase reliability and compensate for the intermittency of renewable energy sources.

In the absence of the A2PP project, however, other power plants could likely be constructed in the project area or in California to serve the demand that could have been met with the A2PP project. New plants constructed in the area could utilize undeveloped land (greenfield sites), possibly creating significant environmental impacts. New plants would be less efficient since they would not share infrastructure as would the A1PP and A2PP. If no new natural gas plants were constructed, TID may have to rely on older power plants. These plants could consume more fuel and emit more air pollutants per kilowatt-hour generated than the proposed project. In the near term, the more likely result is that existing plants, many of which produce higher level of pollutants, could operate more than they do now. Thus, the "no project" alternative is not environmentally superior to the A2PP project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments pertaining to Alternatives have been received.

CONCLUSIONS AND RECOMMENDATION

As determined by Energy Commission staff in the SA, the A2PP is not likely to cause potentially significant impacts. Located adjacent to the A1PP and sharing existing infrastructure, the proposed site is suitable for the project. The alternative sites in the vicinity have disadvantages (e.g. longer gas and transmission interconnections, non-disturbed locations, greater visual presence, closer to receptors) and no significant advantages over the proposed site.

Staff does not believe that alternative technologies such as solar, wind, geothermal, biomass, tidal, and wave present feasible alternatives to the proposed project. The alternative linear routes are feasible but present no clear advantage. With no significant issues at this time, staff does not recommend an alternative over the project as proposed.

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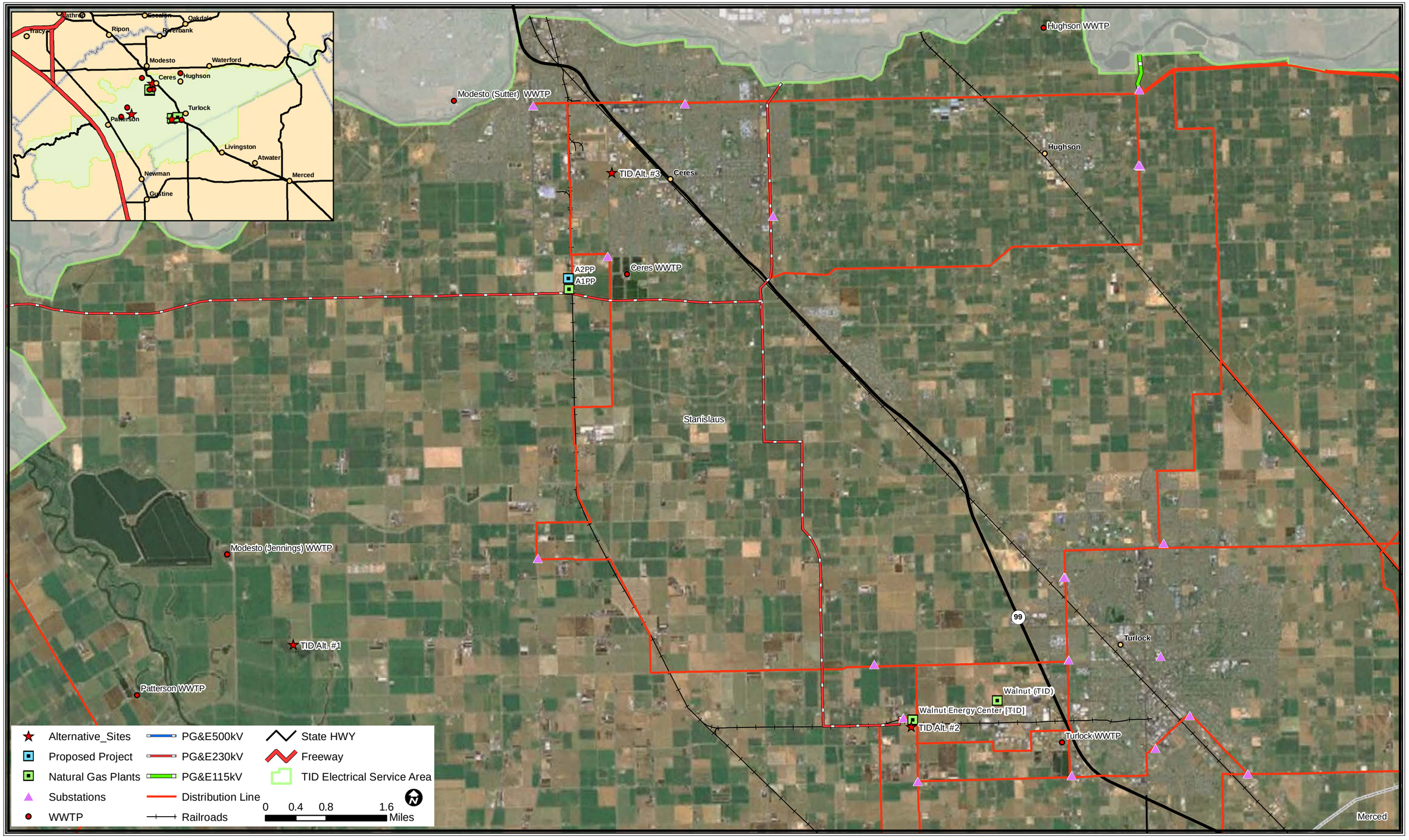
ALTERNATIVES - FIGURE 1

Almond 2 Power Plant



ALTERNATIVES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, FEBRUARY 2010

SOURCE: California Energy Commission, Aspen, NAIP 2005

GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Chris Davis

INTRODUCTION

The project's General Compliance Conditions of Certification, including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated, and closed in compliance with public health and safety, environmental, and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of elements that:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions of certification;
- establish requirements for facility closure plans; and
- specify conditions of certification for each technical area containing the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure below a level of significance. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

DEFINITIONS

The following terms and definitions are used to establish when Conditions of Certification are implemented.

PRE-CONSTRUCTION SITE MOBILIZATION

Site mobilization is limited preconstruction activities at the site to allow for the installation of fencing, construction trailers, construction trailer utilities, and construction trailer parking at the site. Limited ground disturbance, grading, and trenching associated with the above mentioned pre-construction activities is considered part of site mobilization. Walking, driving or parking a passenger vehicle, pickup truck and/or light vehicles is allowable during site mobilization.

CONSTRUCTION

Onsite work to install permanent equipment or structures for any facility.

Ground Disturbance

Construction-related ground disturbance refers to activities that result in the removal of top soil or vegetation at the site beyond site mobilization needs, and for access roads and linear facilities.

Grading, Boring, and Trenching

Construction-related grading, boring, and trenching refers to activities that result in subsurface soil work at the site and for access roads and linear facilities, e.g., alteration of the topographical features such as leveling, removal of hills or high spots, moving of soil from one area to another, and removal of soil.

Notwithstanding the definitions of ground disturbance, grading, boring, and trenching above, construction does **not** include the following:

1. the installation of environmental monitoring equipment;
2. a soil or geological investigation;
3. a topographical survey;
4. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; and
5. any work to provide access to the site for any of the purposes specified in .1, 2, 3, or 4 above.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, “commercial operation” begins after the completion of start-up and commissioning, when the power plant has reached reliable steady-state production of electricity at the rated capacity. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

The Compliance Project Manager (CPM) shall oversee the compliance monitoring and is 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 (petition to amend), and ownership or operational control (petition for change of ownership) (See instructions for filing petitions);
4. Documenting and tracking compliance filings; and
5. Ensuring that compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies, Energy Commission, and staff when handling disputes, complaints, and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, the approval will involve all appropriate Energy Commission staff and management. All submittals must include searchable electronic versions (pdf or MS Word files).

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM usually schedules pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings is to assemble both the Energy Commission's and 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. This is to confirm that all applicable conditions of certification have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain the following documents and information as a public record, in either the Compliance file or Dockets file, for the life of the project (or other period as required):

1. All documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. All monthly and annual compliance reports filed by the project owner;
3. All complaints of noncompliance filed with the Energy Commission; and
4. All petitions for project or condition of certification changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that the compliance conditions of certification and all other conditions of certification that appear in the Commission Decision are satisfied. The compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, conditions of certification, or ownership. Failure to comply with any of the conditions of certification or the compliance conditions may result in reopening of the case and revocation of Energy Commission certification; an administrative fine; or other action as appropriate. A summary of the Compliance Conditions of Certification is included as **Compliance Table 1** at the conclusion of this section.

COMPLIANCE CONDITIONS OF CERTIFICATION

Unrestricted Access (COMPLIANCE-1)

The CPM, responsible Energy Commission staff, and delegated agencies or consultants shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on-site for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

Compliance Record (COMPLIANCE-2)

The project owner shall maintain project files on-site 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, documents submitted as verification for conditions, and other project-related documents.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition.

Compliance Verification Submittals (COMPLIANCE-3)

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by the CPM.

Verification of compliance with the conditions of certification can be accomplished by the following:

1. Monthly and/or annual compliance reports, filed by the project owner or authorized agent, reporting on work done and providing pertinent documentation, as required by the specific conditions of certification;
2. Appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of work, or other evidence that the requirements are satisfied.

Verification lead times 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 project by AFC number, the appropriate condition(s) of certification by condition number(s), and 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 and CEC submittal number.

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 hardcopy submittals shall be addressed as follows:

Chris Davis, CPM
(09-AFC-2C)
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

Those submittals shall be accompanied by a searchable electronic copy, on a CD or by e-mail, as agreed upon by the CPM.

If the project owner desires Energy Commission staff action by a specific date, that request shall be made in the submittal cover letter and shall include a detailed explanation of the effects on the project if that date is not met.

Pre-Construction Matrix and Tasks Prior to Start of Construction (COMPLIANCE-4)

Prior to commencing construction, a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first. It will be submitted in the same format as the compliance matrix described below.

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project development.

If the project owner anticipates commencing project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. Compliance submittals should be completed in advance where the necessary lead time for a required compliance event extends beyond the date anticipated for start of construction. The project owner must understand that the

submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change, based upon the Commission Decision.

Compliance Reporting

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Energy Commission Decision. During construction, the project owner or authorized agent will submit monthly compliance reports. During operation, an annual compliance report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix (COMPLIANCE-5)

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all conditions of certification in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable;
7. the compliance status of each condition, e.g., "not started," "in progress" or "completed" (include the date); and
8. if the condition was amended, the date of the amendment.

Satisfied conditions shall be placed at the end of the matrix.

Monthly Compliance Report (COMPLIANCE-6)

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date upon which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include the AFC number and an initial list of dates for each of the events identified on the **Key Events List.** The Key Events List form is found at the end of these General Conditions.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and an electronic searchable version 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, as well as the conditions they satisfy and submitted as attachments to the monthly compliance report;
3. An initial, and thereafter updated, compliance matrix showing the status of all conditions of certification;
4. A list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;
5. A list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;
6. A cumulative listing of any approved changes to conditions of certification;
7. A listing of any filings submitted to, or permits issued by, other governmental agencies during the month;
8. A projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. A listing of the month's additions to the on-site compliance file; and
10. A listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolution of the resolved actions, and the status of any unresolved actions.

All sections, exhibits, or addendums shall be separated by tabbed dividers or as acceptable by the CPM.

Annual Compliance Report (COMPLIANCE-7)

After construction is complete, the project owner shall submit annual compliance reports instead of monthly compliance reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual compliance reports shall be submitted over the life of the project, unless otherwise specified by the CPM. Each annual compliance report shall include the AFC number, identify the reporting period, and shall contain the following:

1. An updated compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
2. A summary of the current project operating status and an explanation of any significant changes to facility operations during the year;

3. Documents required by specific conditions to be submitted along with the annual compliance report. Each of these items must be identified in the transmittal letter, with the condition it satisfies, and submitted as attachments to the annual compliance report;
4. A cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. An explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. A listing of filings submitted to, or permits issued by, other governmental agencies during the year;
7. A projection of project compliance activities scheduled during the next year;
8. A listing of the year's additions to the on-site compliance file;
9. An evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date (see Compliance Conditions for Facility Closure); and
10. A listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved matters, and the status of any unresolved matters.

Confidential Information (COMPLIANCE-8)

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Executive Director with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501, et. seq.

Annual Energy Facility Compliance Fee (COMPLIANCE-9)

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay an annual compliance fee, which is adjusted annually. Current compliance fee information is available on the Energy Commission's website http://www.energy.ca.gov/siting/filing_fees.html. You may also contact the CPM for the current fee information. The initial payment is due on the date of the Business Meeting at which the Energy Commission adopts the final decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

Reporting of Complaints, Notices, and Citations (COMPLIANCE-10)

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints, or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with a date and time stamp recording. All recorded complaints shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to

passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at: http://www.energy.ca.gov/sitingcases/power_plants_contacts.html

Any changes to the telephone number shall be submitted immediately to the CPM, who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to the CPM of all complaint forms, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations within 10 days of receipt. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations, and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place: planned closure, unplanned temporary closure, and unplanned permanent closure**.**

CLOSURE DEFINITIONS

Planned Closure

A planned closure occurs when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unplanned Temporary Closure

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

Unplanned Permanent Closure

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

COMPLIANCE CONDITIONS FOR FACILITY CLOSURE

Planned Closure (COMPLIANCE-11)

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least 12 months (or other period of time agreed to by the CPM) prior to the commencement of closure activities. The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

Prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

In the event that there are significant issues associated with the proposed facility closure plan's approval, or if the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities until the Energy Commission approves the facility closure plan.

Unplanned Temporary Closure/On-Site Contingency Plan (COMPLIANCE-12)

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that an unplanned temporary closure is likely to be permanent, or for a duration of more than 12 months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

Unplanned Permanent Closure/On-Site Contingency Plan (COMPLIANCE-13)

The on-site contingency plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan, consistent with the requirements for a planned closure, shall be developed and submitted to the CPM within 90 days of the permanent closure or another period of time agreed to by the CPM.

Post Certification Changes to the Energy Commission Decision: Amendments, Ownership Changes, Staff Approved Project Modifications and Verification Changes (COMPLIANCE-14)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility. **It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769.** Implementation of a project modification without first securing Energy Commission, or Energy Commission staff approval, may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for amendments and for staff approved project modifications as specified below. Both shall be filed as a “Petition to Amend.” Staff will determine if the change is significant or insignificant. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the CPM, who will file it with the Energy Commission’s Dockets Unit in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below. They reflect the provisions of Section 1769 at the time this condition was drafted. If the Commission’s rules regarding amendments are amended, the rules in effect at the time an amendment is requested shall apply.

Amendment

The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769(a), when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the final decision, which requires public notice and review of the Energy Commission staff analysis, and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(a). Upon request, the CPM will provide a sample petition to use as a template.

Change of Ownership

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process requires public notice and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(b). Upon request, the CPM will provide a sample petition to use as a template.

Staff Approved Project Modification

Modifications that do not result in deletions or changes to conditions of certification, that are compliant with laws, ordinances, regulations, and standards and will not have significant environmental impacts may be authorized by the CPM as a staff approved project modification pursuant to section 1769(a)(2). This process usually requires minimal time to complete, and requires a 14-day public review of the Notice of Petition to Amend that includes staff's intention to approve the proposed project modification unless substantive objections are filed. These requests must also be submitted in the form of a "petition to amend" as described above.

Verification Change

A verification may be modified by the CPM without requesting an amendment to the decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification.

CBO DELEGATION AND AGENCY COOPERATION

In performing construction and operation monitoring of the project, Energy Commission staff acts as, and has the authority of, the chief building official (CBO). Energy Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Energy Commission staff retains CBO authority when selecting a delegate CBO, including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Energy Commission staff may also seek the cooperation of state, regional, and local agencies that have an interest in environmental protection when conducting project monitoring.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1237, but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current state law and regulations, are described below. They shall be followed unless superseded by future law or regulations.

Informal Dispute Resolution Process

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 an informal dispute resolution process. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents.

This process may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237, but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The process encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be brought before the full Energy Commission for consideration via the complaint and investigation procedure.

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 an 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. Within seven working days of the CPM's request, the project owner shall provide a written report to the CPM of the results of the investigation, including corrective measures proposed or undertaken. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to also provide an initial verbal report, within 48 hours.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures proposed or undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;

2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;

3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner;

4. After the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum that fairly and accurately identifies the positions of all parties and any understandings 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

Any person may file a complaint with the Energy Commission's Dockets Unit alleging noncompliance with a Commission decision adopted pursuant to Public Resources Code section 25500. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1237.

KEY EVENTS LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
Synchronization with Grid and Interconnection	
Complete T/L Construction	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
Complete Gas Pipeline Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-1	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COMPLIANCE-2	Compliance Record	The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COMPLIANCE-3	Compliance Verification Submittals	The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed or the project owner or his agent.
COMPLIANCE-4	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until the all of the following activities/submittals have been completed: • property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns, • a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction, • all pre-construction conditions have been complied with, • the CPM has issued a letter to the project owner authorizing construction.
COMPLIANCE-5	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COMPLIANCE-6	Monthly Compliance Report including a Key Events List	During construction, the project owner shall submit monthly compliance reports (MCRs) which include specific information. The first MCR is due the month following the Energy Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.
COMPLIANCE-7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit annual compliance reports instead of monthly compliance reports.
COMPLIANCE-8	Confidential Information	Any information the project owner deems confidential shall be submitted to the Energy Commission's executive director with a request for confidentiality.
COMPLIANCE-9	Annual fees	Payment of Annual Energy Facility Compliance Fee
COMPLIANCE-10	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM all notices, complaints, and citations.
COMPLIANCE-11	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least 12 months prior to commencement of a planned closure.

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-12	Unplanned Temporary Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COMPLIANCE-13	Unplanned Permanent Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COMPLIANCE-14	Post-certification changes to the Decision	The project owner must petition the Energy Commission to delete or change a condition of certification, modify the project design or operational requirements, and/or transfer ownership of operational control of the facility.

ATTACHMENT A
COMPLAINT REPORT/RESOLUTION FORM

COMPLAINT LOG NUMBER:_____ DOCKET NUMBER:_____

PROJECT NAME:_____

COMPLAINTANT INFORMATION

NAME:_____ PHONE NUMBER:_____

ADDRESS:_____

COMPLAINT

DATE COMPLAINT RECEIVED:_____ TIME COMPLAINT RECEIVED:_____

COMPLAINT RECEIVED BY: ☐ TELEPHONE ☐ IN WRITING (COPY ATTACHED)

DATE OF FIRST OCCURRENCE:_____

DESCRIPTION OF COMPLAINT (INCLUDING DATES, FREQUENCY, AND DURATION):_____

_____

_____

FINDINGS OF INVESTIGATION BY PLANT PERSONNEL:_____

_____

_____

DOES COMPLAINT RELATE TO VIOLATION OF A CEC REQUIREMENT? ☐ YES ☐ NO

DATE COMPLAINTANT CONTACTED TO DISCUSS FINDINGS:_____

DESCRIPTION OF CORECTIVE MEASURES TAKEN OR OTHER COMPLAINT RESOLUTION:_____

_____

_____

DOES COMPLAINTANT AGREE WITH PROPOSED RESOLUTION? ☐ YES ☐ NO

IF NOT, EXPLAIN:_____

_____

CORRECTIVE ACTION

IF CORRECTIVE ACTION NECESSARY, DATE COMPLETED:_____

DATE FIRST LETTER SENT TO COMPLAINTANT (COPY ATTACHED):_____

DATE FINAL LETTER SENT TO COMPLAINTANT (COPY ATTACHED):_____

OTHER RELEVANT INFORMATION:_____

_____

_____

"This information is certified to be correct."

PLANT MANAGER SIGNATURE:_____ DATE:_____

(ATTACH ADDITIONAL PAGES AND ALL SUPPORTING DOCUMENTATION, AS REQUIRED)

PREPARATION TEAM

ALMOND 2 POWER PROJECT
(09-AFC-2)
PREPARATION TEAM

Executive Summary ..... Felicia Miller

Introduction ..... Felicia Miller

Project Description ..... Felicia Miller

Air Quality.....Brewster Birdsall, P.E., QEP and Tao Jiang

Biological Resources.....Dave Bise

Cultural Resources.....Kathleen Forrest and Michael McGuirt

Hazardous Materials Management .....Alvin J. Greenberg, Ph.D. and Rick Tyler

Land Use..... Jeanine Hinde

Noise and Vibration.....Erin Bright

Public Health .....Alvin J. Greenberg, Ph.D.

Socioeconomic Resources.....Kristen Ford

Soils and Water Resources..... Vince Geronimo, P.E. and Rachel Cancienne, EIT

Traffic and Transportation .....Marie McLean

Transmission Line Safety and Nuisance ..... Obed Odoemelam, Ph.D.

Visual Resources .....Marie McLean

Waste Management ..... Ellie Townsend-Hough

Worker Safety and Fire Protection .....Alvin J. Greenberg, Ph.D. and Rick Tyler

Facility Design.....Erin Bright

Geology and Paleontology .....Dal Hunter, Ph.D., C.E.G.

Power Plant Efficiency.....Shahab Khoshmashrab

Power Plant Reliability.....Shahab Khoshmashrab

Transmission System Engineering.....Laiping Ng and Mark Hesters

Alternatives .....Suzanne Phinney, D.Env.

General Conditions.....Chris Davis

Project Assistant .....Hilarie Anderson

DECLARATION OF
Felicia Miller

I, Felicia Miller declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Energy Facilities Siting Division as Project Manager.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared staff testimony on Introduction, Project Description and Executive Summary for the Almond 2 Power Power Plant project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed herein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently hereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/4/10 Signed: Original Signature in Dockets

At: Sacramento, California

Felicia Miller

California Energy Commission
1516 Ninth Street, MS-15
Sacramento, California 95814
(916) 654-4640

Professional Experience

April 2007 to present ***California Energy Commission – Planner III - Siting Project Manager***
Plan, organize, direct and manage the State regulatory process for electric generating plants from application through issuance of permit. Plan, organize and direct the efforts of 23 disciplinary environmental and engineering staff in actions related to the California Environmental Quality Act (CEQA) requirements. Recommend actions, policies and procedures affecting the project and commission program direction. Conduct public workshops and hearings related to proposed projects. I Compile, edit, and issue staff environmental assessments and other CEQA related documents.

2006-2007 ***California State Parks***
Associate Parks & Recreation Specialist – Off Highway Vehicle Division/Prairie City Off-Highway Vehicle Park
Development of resources study to determine watershed and hydrology, soil taxonomy and geology of State park. Lead on assessment and recommendations for watershed remediation and sediment control project. Climate prediction study to determine weather and hydrology patterns of park over a 25-year period. Research analysis for master and general plan update for district off highway vehicle parks.

2005-2006 ***California State Department of Mental Health***
Senior Mental Health Specialist – Program Compliance
Program lead in Fingerprinting Analysis/Criminal Background Checks and Investigations Unit. Coordinated and directed assignments and deadlines for staff. Project lead in development of 2 new database programs used to automate data from fingerprint program and facility investigations. Unit coordinator for compilation, coordination and analysis of sections monthly measures and outcomes report, contributed significantly in eliminating CBC unit backlog. Conducted incident investigations to determine regulatory compliance.

2000-2005 ***California State Parks***
Associate Parks & Recreation Specialist – Grants and Local Services
Administration of park and recreation grants under State and Federal funding to local agencies in over 19 counties statewide and Bureau of Land Management. Provided technical assistance and interpretation of regulations and policy to local agencies, evaluate project status, billing support and documentation, and field inspections to determine compliance with project agreement. Team leader in development of program procedural guides including research of state and federal regulations,

assignments coordination and participation at public hearings and coordinated assignments to meet critical deadlines. Development of program regulations and procedural guide, workshop lead.

1998-2009 ***California State Parks***
Personnel Services Specialist – Human Resources
Personnel and salary transaction functions for a roster of +400 district and HQ employees. Personnel contact with DPR employees for the purpose of responding to questions and dispensing accurate information to HQ and field timekeepers and employees. Contact with outside agencies for purpose of salary and payroll interpretation and processing. Translated bargaining unit contractual information to managers and employees and translated reference guidelines for laws and rules as set forth by DPA, SCO and SPB. Developed and initiated HQ new employee orientation and improved sign up procedures.

1997-1998 ***Department of the Youth Authority***
Public Service and Support Division
Analyzed and reconciled monthly reported from facilities and prepared monthly reimbursement claims to exceed $650K. Compiled data, analyzed and prepared intricate spreadsheets for monthly, quarterly and yearly accounting. Responsible for Mac training and support for division. Chair for United Way campaign.

1994-1997 ***Department of Fish and Game***
Office of Oil Spill Response-Scientific Division
Coordinated and prioritized assignments for division and supervised work of support staff. Coordination of interagency efforts as agency liaison during emergency response efforts during a coastline oil spill. Developed Operations Protocol manual for Incident Command Center and emergency response support team. Facilitated public surveys to determine economic value of recreation and natural resources and determine user trends.

1991-1994 ***John F. Kennedy High School***
Office of Oil Spill Response-Scientific Division
Using district graduation and special education requirements; planned, collected, evaluated and analyzed data from a variety of sources to develop a master schedule for educational programs; critical analysis of all phases of student programs to determine eligibility of curriculum prerequisites and high school graduation eligibility; translated high school graduation requirements and policy from district and inter-district transcripts to make curriculum recommendations, conducted curriculum training program to incoming students and parents, supervised team of student assistants. Program lead for targeted youth.

Education/Credentials

- Bachelor of Arts, Cum Laude, Sacramento State University in Communication Studies, concentration in Rhetorical Criticism
- California Real Estate Sales License, September 1999, license current

DECLARATION OF
James Brewster Birdsall

I, James Brewster Birdsall, declare as follows:

1. I am under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. Under Contract No. 700-08-001, I am serving as an Air Quality Specialist and Project Manager to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program and the Siting, Transmission, and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Air Quality and Greenhouse Gas Emissions** for the Almond 2 Power Plant Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 5, 2010 Signed: Original Signature in Dockets

At: San Francisco, California

Aspen
Environmental Group

BREWSTER BIRDSALL, P.E., QEP
Senior Associate, Air Quality and Engineering

ACADEMIC BACKGROUND
M.S., Civil Engineering, Colorado State University, 1993
B.S., Mechanical Engineering, Lehigh University, 1991

PROFESSIONAL EXPERIENCE

Mr. Birdsall is an environmental scientist who specializes in air quality and noise analyses for land development related projects and air quality risk assessments. He has nine years of consulting experience with expertise in environmental impact assessment under the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and the Clean Air Act. His focus is on air permitting, and air quality and noise-impact modeling, which includes field monitoring for traffic and other community noise sources.

Aspen Environmental Group — 2001 to present

Mr. Birdsall's project experience at Aspen includes the following:

Technical Studies for CEC Contract – Review of Power Plant AFCs. Mr. Birdsall assists the California Energy Commission (CEC) as a technical specialist by reviewing and providing testimony on Applications for Certification (AFC) for new power plants throughout California.

- **Tesla Power Plant.** Lead technical staff for air quality assessment and analyst of visible plumes for new 1,120 MW combined cycle power plant and 11-mile recycled water pipeline in rural eastern Alameda County near Tracy.
- **Inland Empire Energy Center.** Lead technical staff for air quality assessment for new 670 MW combined cycle power plant near Romoland in Riverside County.
- **Palomar Energy.** Lead technical staff for air quality assessment and supporting staff for cooling system studies for new 540 MW combined cycle power plant in northern San Diego County.
- **Kings River Conservation District Peaking Power Plant.** Lead technical staff for air quality assessment of new 97 MW simple cycle power plant in Fresno County.
- **Avenal Energy.** Lead technical staff for air quality assessment and analyst of visible plumes for large new combined cycle power plant near Avenal in Kings County.
- **Blythe Energy Project Phase II.** Lead technical staff for air quality assessment for new 520 MW combined cycle power plant and affiliated 118-mile transmission line, in the Mojave Desert and Coachella Valley of Riverside County.
- **Russell City Energy Center.** Lead technical staff for noise assessment of new 600 MW combined cycle power plant adjacent to shoreline recreational areas in Hayward.
- **Los Esteros Critical Energy Facility.** Lead technical staff for noise assessment and analyst of visible plumes for new 180 MW simple cycle power plant adjacent to recreational areas in San Jose.

- **Environmental Performance Report.** Technical review and editorial assistance for environmental portion of the first Integrated Energy Policy Report for the Governor and Legislature.
- **Air Quality Compliance.** Technical staff for analysis of modifications to permit conditions at the Moss Landing Power Plant. Prepared independent analysis of permit requirements and environmental consequences of increasing the capacity of the Midway-Sunset Cogeneration Project.
- **Alternative Cooling Technology Studies.** Supporting staff for analyses of dry cooling and hybrid cooling alternatives for the Cosumnes Power Plant and Palomar Energy Project. Coordinated and edited documentation from design engineers and other specialists.

For the **California Public Utilities Commission**:

- **San Onofre Nuclear Generating Station and Diablo Canyon Power Plant, Steam Generator Replacement Projects.** Currently serving as Deputy Project Manager for Environmental Impact Reports on the proposed improvements to these controversial nuclear power plants. Preparing certain administrative and technical portions of reports and coordinating the environmental documents with team of analysts.
- **Miguel-Mission 230 kV #2 Transmission Line.** Conducted the air quality and noise review for a system that would reduce transmission constraints between San Diego County and generators within the U.S. and Mexico. Provided oversight of the engineers studying impacts to traffic and transportation and the transmission system design.
- **Jefferson-Martin 230 kV Transmission Line.** Prepared air quality and noise studies for construction and operation of a 27-mile transmission line through urban and rural San Mateo County. The project is proposed to meet the projected electric demand in the Cities of Burlingame, Millbrae, San Bruno, South San Francisco, Brisbane, Colma, Daly City, and San Francisco.
- **Viejo System Transmission Project.** Prepared air quality, noise, and traffic analyses for construction of a controversial transmission improvement project in suburban south Orange County.
- **Looking Glass Networks Telecommunications Project.** Prepared the air quality and noise analyses for this Initial Study/Mitigated Negative Declaration (IS/MND) evaluating proposed fiber optic connections throughout the San Francisco Bay and Los Angeles areas, and developed programmatic mitigation measures for implementation of the metropolitan area network.

Presidio Trust, Presidio of San Francisco. Provided impact analysis for demolition, rehabilitation, and infill construction within the Public Health Service Hospital District, within the Golden Gate National Recreation Area and adjacent to sensitive San Francisco residences. Provided technical support and peer review of noise and vibration analyses related to the Doyle Drive Reconstruction through the Presidio of San Francisco. Involved protecting natural sounds consistent with National Park Service policy.

California State Lands Commission, Monterey Accelerated Research System Cabled Observatory. Providing technical analysis of air quality and noise effects of installing new underwater equipment in Monterey Bay. Supporting efforts of marine biologists with analysis of underwater noise.

California State Lands Commission, Concord-Sacramento Pipeline. Provided technical analysis of air quality and noise effects of constructing a new 20-inch, 70-mile petroleum products pipeline, including upgrades to storage tank facilities in Concord and distribution systems in West Sacramento.

California Department of Water Resources, Piru Creek Erosion Repairs and Bridge Seismic Retrofit Project. Provided assessment of air quality and noise impacts for construction of upgrades.

Ventura County Resource Conservation District, Casitas Springs *Arundo Donax* Removal Demonstration Project. Prepared estimates of community noise impacts and air quality assessment for cutting and removing non-native plants for improving flood control along the Ventura River.

Technical Support for U.S. Army Corps of Engineers. Analyzed construction noise and air quality effects and described applicability of general conformity rule for various flood control improvements in Arizona and Southern California.

Technical Support for Los Angeles Unified School District. Provided technical analysis of air quality and noise effects for school expansion, play area expansion, and temporary classroom projects, including reviews of cumulative, regional air quality consequences of temporary projects.

EIP Associates 1998 to 2001

As a Senior Environmental Scientist at **EIP Associates**, Mr. Birdsall performed comprehensive analyses of air quality and noise impacts for Environmental Impact Reports/Statements and independent studies. His projects at EIP included:

- **Bay Area Rapid Transit District, Oakland Airport Connector EIS/EIR.** Prepared noise impact evaluation and mitigation strategies. Conducted community noise monitoring and assessment according to Federal Transit Administration methodology.
- **Presidio Trust Implementation Plan EIS and Letterman Complex Supplemental EIS.** Prepared community noise impact assessment and traffic noise mitigation strategies. Air quality management policy consistency analysis. The plan was awarded the 2003 Outstanding Land Use Plan from the Association of Environmental Professionals.
- **San Francisco International Airport, Offshore Runway Construction Concepts, AGS Design Team.** Conducted preliminary environmental review of design and construction concepts for runway expansion. Prepared emission control strategies for general conformity rule.
- **Sacramento Metropolitan Airport Master Plan EIS/EIR, Sacramento County Department of Environmental Review and Assessment.** Baseline emission inventory and regulatory constraints.
- **Desert Resorts Regional Airport, Thermal, Riverside County.** Emission inventory and general conformity determination for runway extension and taxiway improvements.
- **San Joaquin Area Flood Control Agency, Stockton Areawide Flood Control Projects.** Reviewed emission inventories and retroactive general conformity rule applicability for construction activities.
- **Alameda County Flood Control and Water Conservation District, Zone 7, Altamont Water Treatment Plant EIR.** Analyzed air quality and community noise effects of three potential water plant sites in remote eastern Alameda County.
- **Santa Clara Valley Water District, Coyote Watershed, Lower Silver Creek Project.** Analyzed air quality and community noise effects for Initial Study/Environmental Assessment of constructing flood control improvements and habitat restoration.
- **University of California, Davis.** Prepared campuswide health risk assessment update, which included toxic air contaminant emission inventory and dispersion modeling using ISC.

- **University of California, Berkeley.** Prepared initial air quality and noise technical studies for Long Range Development Plan Update EIR and analyses for Northeast Quadrant Science and Safety Project (Stanley Hall replacement building) EIR.
- **Merced County, Draft University Community Plan.** Prepared air quality and noise background studies and policy discussion papers for the new Merced Campus of the University of California.
- **Allegro Jack London Square Project, SNK Development.** Provided expert testimony on the pile driving noise impacts to residents in a revitalized, high-density City of Oakland neighborhood. Conducted field surveys with City Staff and evaluated compliance with City noise ordinance.
- **Maranatha High School and Playing Fields Project, City of Sierra Madre.** Prepared the community noise technical study for a new private high school with outdoor amphitheater and athletic facilities. Characterized noise from events to determine impact level on sensitive residential community.
- **State Route 275 Modification Project, City of West Sacramento.** Prepared noise technical studies on the realignment of the State Route 275 Modification Project. Required assessment of new traffic noise impacts caused by rerouting traffic to grade level in close proximity of existing sensitive land uses and identification of feasible measures to insulate lodging uses.
- **City of Mountain View, Whisman Road Transit Oriented Development MND.** Deputy Project Manager for Negative Declaration related to high-density office development at the Middlefield-Ellis-Whisman Superfund Site. Prepared various technical sections, managed traffic subconsultant, and coordinated preparing the environmental documents with the city staff.

Trinity Consultants 1994 to 1998

Mr. Birdsall prepared compliance strategies, evaluated modeled impacts, and negotiated air permits while a Project Supervisor at **Trinity Consultants**, an environmental firm specializing in air quality.

- **Browning-Ferris Gas Services.** Coordinated nationwide Title V program implementation, secured numerous new source and operating permits, supported rollout of federal new source performance standards for municipal solid waste landfills and landfill gas to energy facilities.
- **Newmont Mining Joint Venture, Batu Hijau Project.** Environmental impact studies for open-pit metallic mineral mining facility and independent power production facility. Included noise assessment for "greenfield" power plant and air quality impacts evaluation in complex, coastal terrain.
- **Questar Pipeline, TransColorado Pipeline Project.** Secured new source permits for air quality effects related to construction and operation of major natural gas pipeline including compressor stations.
- **Coastal Field Services, Altamont Gas Plant.** Negotiated Title V operating permits for upstream natural gas processing plant and associated field compressor stations.
- **Solvay Soda Ash Joint Venture.** Developed particulate matter modeling protocol with State agency.
- **Potlatch Corporation.** Facilitywide emission inventory and permitting for a wood products plant. Included regionwide analyses of ambient air quality standards and resolving existing modeled violations.

NOISE IMPACT ASSESSMENT MODELS

- Federal Highway Administration Traffic Noise Model
- California Department of Transportation Traffic Noise Model (SOUND32)
- FTA Transit Noise Assessment and Mitigation Methodology

AIR QUALITY MODELING EXPERTISE

MVEI/EMFAC; URBEMIS; CALINE4; SCREEN; ISC; CTDM; TANKS; Landfill Gas Emissions Model.

ADDITIONAL TRAINING AND COURSES

- Fundamentals of Noise and Vibration for the California Energy Commission
- Expert Witness Training, California Energy Commission
- Co-Instructor, Air Permitting Issues for Municipal Solid Waste Landfills, Trinity Consultants
- Fundamentals of New Source Review Workshop, Air and Waste Management Association
- Title V and Compliance Assurance Monitoring Workshops, Air and Waste Management Association
- NATO Advanced Studies Institute, Wind Climates in Cities

PROFESSIONAL AFFILIATIONS AND AWARDS

- Professional Engineer (Mechanical, California #32565)
- Qualified Environmental Professional, Institute of Professional Environmental Practice (#03030005)
- 2001 Outstanding Performance Award presented by the California Energy Commission
- Air and Waste Management Association since 1994

PUBLICATIONS

Smith, P.J., J.B. Birdsall, and P.E. Delamater. "A Discussion of Air Permitting Issues for Landfill Gas-To-Energy Projects." 88th Annual Meeting and Exhibition of the Air and Waste Management Association, San Antonio, Texas, 1995.

Meroney, R.N., D.E. Neff, and J.B. Birdsall. "Wind-Tunnel Simulation of Infiltration Across Permeable Building Envelopes: Energy and Air Pollution Exchange Rates." 7th International Symposium on Measurement and Modeling of Environmental Flows. International Mechanical Engineering Congress and Exposition, San Francisco, California, 1995.

Birdsall, J.B. and R.N. Meroney. "Model Scale and Numerical Evaluation of Tracer Gas Distribution Due to Wind-Forced Natural Ventilation." 9th International Conference on Wind Engineering, New Delhi, India, 1995.

Birdsall, J.B. Physical and Numerical Simulation of Wind-Forced Natural Ventilation, MS Thesis, Colorado State University, Fort Collins, Colorado, 1993.

DECLARATION OF
Tao Jiang

I, Tao Jiang, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as an Air Resources Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the **Air Quality** for the **Almond 2 Power Plant** project (09-AFC-2) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 14, 2010 Signed: Original signed by T. Jiang

At: Sacramento, California

Tao Jiang, Ph.D.

Professional Experience

Air Resources Engineer ***(Jan. 2009 – Present)***

California Energy Commission, Siting Transmission and Environmental Protection Division

Currently acting as air quality technical staff on Siting projects filed with the Energy Commission including Abengoa Mojave Solar, Ridgecrest Solar Millennium and Almond 2 Power Plant, and compliance projects including 42 power plants in construction and operation. Specific responsibilities include the following:

- Analyze the impacts of the construction and operation of large power generation projects on air quality, Green House Gas and climate change
- Determine the conformance to applicable U.S. EPA, CARB and local air district regulations and standards
- Investigate and recommend appropriate emission mitigation measures
- Prepare air quality staff assessments and technical testimony
- Develop and monitor air quality compliance plans
- Review and evaluate U.S. EPA, CARB, and local air district air quality rules and regulations
- Collect, analyze and evaluate data for the effects of air pollutants and power plant emissions on human health, vegetation, wildlife, water resources and the environment
- Develop, recommend, and implement statewide planning and policy initiatives for the Energy Commission and Governor

Research Assistant ***(Sep. 2004 – Dec. 2008)***

University of California, Riverside, Chemical & Environmental Engineering

- Investigated phase behavior of air colloidal particles
- Study mediated colloidal interactions in the air particle dispersions
- Construct and evaluate models for gas molecules and air particulate matters
- Perform computer simulation and modeling for gas molecules and air particulate matters

Education

PhD Chemical & Environmental Engineering, University of California, Riverside (August, 2008)
ME Materials Science and Engineering, Beijing University of Chemical Technology (June, 2003)
BE Materials Science and Engineering, Beijing University of Chemical Technology (June, 2000)

DECLARATION OF
David Bise

I**, David Bise**, declare as follows:

1. I am presently employed by the California Energy Commission in the **Environmental Protection Office** of the **Energy Facilities Siting Division** as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Biological Resources** for the Almond 2 Project based on my independent analysis of the application and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 5, 2010 Signed: Original Signature in Dockets

At: Sacramento, California

David Bise

Education

University of California at Berkeley
M.S. Wildland Resource Science with emphasis in wildlife management, 1998
Thesis: "Vertebrate-Habitat Relationships in Sierra Nevada Mixed Conifer Forest"

University of California at Davis
B.S. Zoology, Psychology minor, 1992

Relevant Experience

PLANNER II
California Energy Commission, Sacramento, California December 2009 to present
Duties include preparation of biological analyses in power plant siting cases, reviewing environmental compliance, and construction and compliance monitoring on construction sites and during plant operations.

SENIOR BIOLOGIST
Foothill Associates, Rocklin, California March 2004 to December 2009
Duties included conducting biological constraints analyses, project management, budget preparation, focused special-status wildlife and plant surveys, wetland delineations, and tree surveys. Work products that I prepare include biological resource assessments, tree survey reports, tree mitigation monitoring plans, wetland delineations, EIR/EIS biology sections, project mitigation monitoring plans, initial studies, and Section 7 biological assessments. Work area includes Sierras, Bay Area, and greater Sacramento area as well as some project work in southern California. I also prepare summary reports for the U.S. Fish and Wildlife Service for focused survey work that I perform under my survey permits.

As a senior biologist, I mentored 3 biology staff members and peer reviewed biological documentation prepared by junior biologists. Work duties also include budgets, scopes and schedules for new project work, workload management for junior staff, project coordination and scheduling, conducting client, agency, and general public meetings, and various marketing tasks including attending marketing meetings on behalf of the biology division and conducting marketing and proposal interviews.

WILDLIFE BIOLOGIST
Sapphos Environmental Inc., Pasadena, California February 2002 to September 2003
Duties included conducting focused wildlife and plant surveys, performing biological assessments, vegetation community mapping, project management and project budget preparation, and mentoring junior staff. Work products prepared included CEQA/NEPA documents such as EIRs, EISs, BAs, and biological technical reports. I also performed project management and budget preparation for a variety of large and small biological tasks. I also prepared summary reports for focused survey work that I performed under my survey permits. Work area included greater Los Angeles, Riverside, San Bernardino, and San Diego counties.

WILDLIFE BIOLOGIST
EDAW Earth and Environmental, San Diego, California March 2001 to January 2002
Duties included conducting focused special-status wildlife and plant surveys, biological site assessments and constraints analyses, vegetation community mapping, and preparation of environmental documents such as biological assessments, biological constraints analyses, and focused survey reports.

ASSOCIATE BIOLOGIST
Ogden Environmental and Energy Services, San Diego, California April 1999 to March 2001
Duties included endangered species surveys, biological monitoring, construction monitoring, and pre-development surveys. I assisted in writing of biotechnical reports, environmental impact statements, and project proposals. I also performed project management work including preparation of project budgets and project scheduling.

PRIMARY BANDER
Upper Klamath Lake, Oregon September 1998 to October 1998
Duties included performing migration banding of passerine species for the Redwood Sciences Lab of the US Forest Service. Supervised and instructed volunteer banders. Required long hours in the field and some camping overnight for several days at a time. Work products included preparation of banding datasheets and summary banding reports.

WILDLIFE BIOLOGIST
Havasu National Wildlife Refuge Needles, California April 1998 to August 1998
Duties included performing nest searches for federally endangered southwestern willow flycatchers. Job involved extensive nest searching, point counts, banding of adults and juveniles, and vegetation mapping as well as surveying for associated resident and migratory bird species. Work products included survey reports and periodic nest status reports.

FIELD ASSISTANT
Barksdale AFB, Louisiana April 1997 to July 1997
Performed nest searches for resident and neo-tropical migrants in southern pine forests as well as extensive mist netting of resident and migrant birds in northwestern Louisiana. Required prior nest searching and mist-netting experience and ability to identify eastern bird species by sight and sound.

Memberships and Awards

- Member of national and western section of Wildlife Society
- Member of national and western section of International Society of Arboriculture
- USFWS approved biologist for Natomas Basin HCP surveys
- Nevada County, California approved biologist
- El Dorado County, California approved biologist
- Graduated with high honors from UC Davis and UC Berkeley

Special Skills

- Permitted with US Fish and Wildlife Service to survey for vernal pool invertebrates (fairy shrimp), coastal California gnatcatcher, least Bell's vireo, and southwestern willow flycatcher
- International Society of Arboriculture certified arborist
- Completed wetland delineation training course
- Permitted with the federal Bird Banding Laboratory (inactive)
- Attended Wildlife Society red-legged frog workshop
- Attended Desert Tortoise Council training workshop
- Completed Bureau of Land Management flat-tailed horned lizard survey course
- Hold a scientific collecting permit with California Department of Fish and Game
- Completed fairy shrimp identification class
- Completed Arizona Department of Game and Fish willow flycatcher survey course (4/98)

DECLARATION OF
Kathleen Forrest

I, Kathleen Forrest, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as a Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the **Cultural Resources Section** for the **Almond 2** project (09-AFC-2) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/5/10 Signed: Original Signature in Dockets

At: Sacramento, California

Kathleen A. Forrest

PROFESSIONAL EXPERIENCE

Planner II, Siting, Transmission and Environmental Protection Division, California Energy Commission, Sacramento, CA, December 2009-Present
Cultural resource specialist performing technical analyses assessing cultural resources implications of energy resource utilization and electric power generation.

Environmental Review

- Review and analyze applications for adequacy, including identification of cultural resources, project-related impacts, and mitigations
- Negotiate with applicants, consultants and other staff to develop solutions that achieve project objectives
- Prepare and present complex and comprehensive reports and recommendations orally and in writing, including analysis of complex data and working knowledge of the legal requirements protecting cultural resources
- Formulate mitigation techniques to prevent significant impacts to cultural resources
- Testify as subject expert at Energy Commission project certification hearings
- Participate in site visits, public workshops and hearings

Associate Planner, Preservation Office, City of Sacramento, Development Services Department
Sacramento, CA, July 2006-July 2009
Cultural resource specialist in City's Preservation Office responsible for a wide range of complex cultural resources programs, policies and project reviews.

Development Project Application Review & Management

- Interpret the Secretary of the Interior's Standards and negotiate with developers, property owners, design professionals, contractors and other city staff to reach design solutions that achieved development project objectives
- Analyzed 36 development proposals for consistency with the Secretary of the Interior's Standards
- Managed Certified Local Government Program grant-funded survey project, including RFQ and consultant selection process, contract negotiations, schedule, review of consultant work, and reporting requirements to State Office of Historic Preservation
- Led multi-disciplinary Matrix review teams to facilitate a timely, seamless and predictable development review for the applicant through planning and building permit processes
- Worked with City Council members and staff on politically sensitive issues

Environmental Review

- Reviewed and provided comments on adequacy of Cultural Resources sections of CEQA and NEPA documents, including identification of cultural resources, project-related impacts, and mitigations
- Prepared 430 recommendations to the Preservation Director and Planning staff regarding potential cultural resources eligibility for ministerial and discretionary projects

Historic Resource Nomination & Management

- Presentations to the City Council, Preservation Commission, Preservation Director, community groups and staff regarding Landmark and Historic District nominations and preservation programs, including preparation of staff reports, informational handouts and visual presentations
- Managed Preservation Commission's Historic Resources Survey Committee
- Updated and maintained the Sacramento Register of Historic and Cultural Resources

Kathleen A. Forrest

Historic Compliance Coordinator, Presidio Trust, San Francisco, CA, January 2004-July 2006
Monitored and assisted in discharging the agency's responsibilities for historic structures within the Presidio of San Francisco

NEPA and Section 106 Review

- Communicated with Presidio Trust personnel regarding NEPA and Section 106 compliance responsibilities and internal procedures to ensure that the required review & consultation occurred
- Collected, analyzed and interpreted information for all Section 106 documentation (determinations of no effect and no adverse effect by the Federal Preservation Officer) for weekly NHPA/NEPA compliance meeting, including preparation of annual report
- Carried out mitigation monitoring of commercial and residential real estate development projects
- Led organization-wide training and compliance on NHPA the Secretary of the Interior's Standards for the Treatment of Historic Properties
- Represented the Presidio Trust at public and partner agency meetings
- Managed preservation compliance files and database
- Assisted FPO in formal consultation for undertakings outside the Programmatic Agreement

Project Management

- Facilitated a successful relationship with trades crews and technical personnel to affect positive historic preservation projects. Began in non-communicative situation and built trust and open communication with those Operations and Maintenance employees that are essential to preservation projects
- Managed building preservation studies and residential rehabilitation projects
- Visited project sites to advise project managers and trades people during project planning and implementation regarding compliance requirements and mitigations

Special Project: Volunteer Coordinator, California Preservation Foundation Conference Steering Committee, 2004.

- Recruited 80 volunteers to staff the 29th annual California Preservation Foundation Conference (2004) at the Presidio of San Francisco from local and state-wide historical associations, local neighborhood associations, regional parks, and interested individuals. Joined Steering Committee halfway through the planning process with no volunteers in place; recruited most volunteers in history of conference to that date
- Coordinated and trained volunteers based on availability, interest and need

Architectural Conservator, Carey & Co., San Francisco, CA. April 2002-December 2003
Staff architectural conservator conducting laboratory analysis and historic research and documentation.

- Performed conditions assessments of historic structures, including identification of character-defining features, finishes analysis of historic paint samples, and treatment recommendations
- Supervised on-site product testing for effectiveness and consistency with the Secretary of the Interior's Standards
- Conducted historical assessments of prospective development project areas to identify potential historic resources
- Prepared historic structures reports, including historic research, surveys, identification of significant features and characteristics, and treatment recommendations

Bandelier National Monument, Los Alamos, NM. June 2000 and June-September 2001
Architectural conservation intern and seasonal employee. Conducted historical research and documentation of cliff dwellings.

Mesa Verde National Park, Mesa Verde, CO. July 2000
Architectural conservation intern. Carried out documentation and on-site treatment at Cliff Palace site.

RELEVANT EDUCATION AND TRAINING

Graduate Program in Historic Preservation, University of Pennsylvania, Philadelphia, PA
Master of Science, May 2001
Emphasis on conservation of architectural materials, conditions assessment methodology and technological applications in documentation, architectural history and archival and site documentation.

University of Massachusetts, Amherst, MA
Bachelor of Arts, cum laude, May 1999.
Major, History. Minor, Anthropology.
Junior semester abroad, University College London, London, England

Environmental Impact Analysis: CEQA and NEPA, Spring 2007, CSU Sacramento
Review of legislative and judicial requirements for environmental impact analysis.

NEPA Workshop. March 28, 2004. UC Santa Cruz Extension
One-day workshop in NEPA policy.

DECLARATION OF
Michael D. McGuirt

I, **Michael D. McGuirt**, declare as follows:

1. I am presently employed by The California Energy Commission in the **Siting, Transmission, and Environmental Protection Division** as a **Planner III**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped in the preparation of the staff testimony on **Cultural Resources,** for the Almond II Power Plant project, based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 26, 2010 Signed: Original Signature in Dockets

At: Sacramento, California

MICHAEL D. MCGUIRT, MA, RPA

15310 Abierto Drive ◦ Rancho Murieta, California ◦ 95683-9192 ◦ 916.354.1345 ◦ mikeandbeate@netzero.net

OBJECTIVE

To participate in the consultations that guide the management of heritage resources in native, public, and private trusts, to foster public support for heritage resource conservation through archaeological research and public outreach, and to contribute to the formulation of historic preservation policy.

EDUCATION

MASTER OF ARTS in Anthropology ◦ The University of Texas at Austin May 1996

Area concentration in the North American Southwest. Technical concentrations in geoarchaeology, palynology, and ceramic analysis.

BACHELOR OF ARTS in Anthropology and Archaeological Studies ◦ The University of Texas at Austin December 1990

Area concentrations in Mesoamerica and the Andes. Technical concentration in lithic analysis.

PROFESSIONAL EMPLOYMENT

ENERGY PLANNER II ◦ California Energy Commission, Sacramento, California November 2007 to November 2008

Develop environmental impact analyses of the potential effects that the construction and operation of proposed thermal power plants may have on significant cultural resources. Apply applicable Federal, State, and local statutes and regulations, as they relate to the consideration of cultural resources. Design and execute cultural resource impact analyses that are appropriate to the specific regulatory context for each proposed project. Gather and evaluate information on projects and on cultural resources in project areas. Develop and maintain agency and public relationships to acquire the most useful data and to elicit input in the development of California Energy Commission conditions of certification. Succinctly convey, orally in different public forums and in different written technical formats, the results of cultural resource impact analyses and proposed conditions of certifications meant to mitigate adverse impacts to significant cultural resources. Periodic reviews of licensees' actions to ensure compliance with extant conditions of certification. Oversight of consultants' who are preparing cultural resource impact analyses preservation program.

SENIOR STATE ARCHAEOLOGIST ◦ Office of Historic Preservation, California Department of Parks and Recreation (California State Parks), Sacramento, California December 2004 to December 2005

Out-of-class assignment supervising the Project Review Unit for the California State Historic Preservation Officer (SHPO) in the California Office of Historic Preservation (OHP). As the Acting Chief of Project Review, I managed and trained a staff of eight professionals and one clerical assistant to conduct, on behalf of the SHPO, the review of all Federal agency actions in the State of California under 36 CFR Part 800. 36 CFR Part 800 is the Advisory Council on Historic Preservation's implementing regulation for Section 106 of the National Historic Preservation Act of 1966, and the primary Federal historic preservation program.

ASSOCIATE STATE ARCHAEOLOGIST ◦ Office of Historic Preservation, California Department of Parks and Recreation (California State Parks), Sacramento, California May 2001 to November 2007

Project Review Unit archaeologist for the California State Historic Preservation Officer (SHPO). Consulted under 36 CFR Part 800 on the adequacy of federal agency efforts to comply with Section 106 of

the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470f). Served as SHPO contact person for informal federal agency consultation and formal initiation of Section 106 consultation (36 CFR § 800.3). Reviewed documentation of and provide comment on federal agency determinations and findings (36 CFR §§ 800.4 and 800.5). Negotiated, drafted, and reviewed memoranda of agreement and treatment plans to resolve adverse effects to historic properties (36 CFR § 800.6). Negotiated, drafted, and reviewed program alternatives and management plans (36 CFR § 800.14). Administered federal agency efforts to comply with previously executed agreement documents. Developed and delivered public and professional presentations and workshops on the Section 106 regulatory process in California and the role of the SHPO in Section 106 consultation. Helped create initiatives through the National Park Service's Certified Local Government (CLG) program to encourage the development of local community archaeological site preservation plans. Evaluated and recommended proposals for CLG grants and helped administer resultant grants. Reviewed and provided comment on National Register of Historic Places (National Register) property nominations, and prepared and presented staff reports on the nominations to the State Historical Resources Commission. Member of committee to revise the Comprehensive Statewide Historic Preservation Plan for California, and author of the archaeology section of the plan. The Office of Historic Preservation's (OHP) liaison to the Society for California Archaeology (June 2002 to April 2010).

ARCHAEOLOGICAL CONSULTANT ◦ Kaniakapūpū Project, O`ahu, Hawai`i ◦ Department of Anthropology, University of Hawai`i at Mānoa, Honolulu, Hawai`i June 2000

Recorded exposed architectural elements and directed test excavations to reconstruct building sequences of Native Hawaiian stone architecture. Advised on the interpretation of archaeological stratigraphy and on the field application of archaeological mapping methods and techniques.

ENVIRONMENTAL SPECIALIST III ◦ Jones & Stokes, Sacramento, California February 1999 to May 2001

Designed, conducted, and managed short- and long-term archaeological projects in California, Nevada, and New Mexico to comply with Sections 106 and 110 of the NHPA. Prepared proposals. Assisted with client contract negotiations. Conducted archaeological record searches and archival research. Directed Phase I pedestrian inventory surveys and test excavations for Phase II evaluations. Analyzed material culture assemblages. Prepared technical reports and regulatory compliance documents including National Register property and district evaluations, and monitoring and discovery plans. Represented clients in consultations with federal and state agencies, and coordinated and managed clients' compliance with federal cultural resource regulations and the cultural resource regulations of California, Nevada, and New Mexico.

ARCHAEOLOGICAL TECHNICIAN ◦ B.O.A.S., Inc., Seattle, Washington August 1998 to October 1998

Assisted with data recovery excavations on a short-term cultural resource management contract.

ASSISTANT ANTHROPOLOGIST ◦ Bernice Pauahi Bishop Museum, Honolulu, Hawai`i August 1996 to June 1998

Assisted with archaeological project design, preparation of proposals, and client contract negotiations, directed Phase I pedestrian inventory surveys, test excavations for Phase I subsurface inventory surveys, test excavations for property evaluations, and data recovery excavations, and assisted with preparation of technical reports on short-term cultural resource management contracts. Analyzed field records, prepared site reports and synthetic report chapters, and analyzed and prepared reports on lithic assemblages for Phases I–III of a long-term federal highway project (Interstate Route H–3). Conducted research in Hawaiian archaeology, and delivered public and professional presentations of that research. Advised on the integration of geoarchaeological methods and techniques into cultural resource management field efforts, and on geoarchaeological interpretations of extant field records, and designed and conducted geoarchaeological components of fieldwork for short–term cultural resource management contracts.

FIELD DIRECTOR ◦ Chersonesos Project, Ukraine, Eastern Europe ◦ Institute of Classical Archaeology, University of Texas at Austin, Austin, Texas May 1996 to July 1996

Assisted in archaeological project design. Directed a geoarchaeological reconnaissance, a pedestrian inventory survey, archaeological mapping, test excavations, and data recovery excavations in the National Preserve of Tauric Chersonesos. Conducted on-site project presentations for the United States Ambassador to Ukraine, and Ukrainian and Russian archaeological scholars. Assisted in the preparation and implementation of archaeological site preservation plans. Taught archaeological field methods and techniques to graduate students. Prepared portion of requisite field report for Crimean Archaeological Council, Simferopol.

ASSISTANT FIELD DIRECTOR ◦ Chersonesos Project, Ukraine, Eastern Europe ◦ Institute of Classical Archaeology, University of Texas at Austin, Austin, Texas May 1995 to July 1995

Assisted in the direction of data recovery excavations in the National Preserve of Tauric Chersonesos. Taught archaeological field methods and techniques to graduate students. Advised on the interpretation of archaeological stratigraphy.

ARCHEOLOGIST I ◦ Archeology Survey Team ◦ Texas Parks and Wildlife Department, Austin, Texas December 1994 to May 1995

Assisted in the direction of pedestrian inventory surveys, the preparation of cultural resource management plans, and the preparation of state site forms and reports of investigations. Advised on the integration of global positioning system (GPS) technology and the field methods of archaeological survey.

RESEARCH ASSISTANT ◦ Colha Project, Belize, Central America ◦ Department of Anthropology, University of Texas at Austin, Austin, Texas July 1994 to August 1994

Conducted an extensive ground survey to correct the published base map for the Maya site of Colha. Assisted in mapping of surface architectural ruins. Directed a test excavation crew. Assisted in the preparation of the field report.

ARCHAEOLOGIST ◦ Lower Colorado River Authority, Austin, Texas February 1994 to December 1994

Designed and implemented trial mitigation plans for archaeological sites threatened by fluvial and lacustrine erosion. Assisted in pedestrian inventory surveys and test excavations, the preparation of state site forms, the development of the agency's database of its archaeological site inventory, and public education initiatives that included site tours for primary and secondary students, and workshops for primary and secondary teachers.

COLLEGIATE EXPERIENCE

TEACHING ASSISTANT ◦ Archaeological Analysis ◦ Department of Anthropology, University of Texas at Austin, Austin, Texas August 1993 to December 1993

Presented undergraduate lectures on archaeological method and theory. Wrote and graded examinations. Advised students.

TEACHING ASSISTANT ◦ Archaeological Field School, New Mexico ◦ Department of Anthropology, University of Texas at Austin, Austin, Texas May 1993 to July 1993

Taught archaeological field methods and techniques to undergraduate and graduate students.

PROJECT ARCHAEOLOGIST ◦ WS Ranch Project, New Mexico ◦ Department of Anthropology, University of Texas at Austin, Austin, Texas May 1992 to July 1992, May 1993 to July 1993

Designed and prepared proposals for two field seasons. Addressed New Mexico State Historic Preservation Office and United States Forest Service comments on the proposals. Directed test excavations and data recovery excavations for two field seasons. Conducted geoarchaeological, palynological, and material culture analyses. Prepared a report of the research.

VOLUNTEER LITHIC ANALYST ◦ WS Ranch Project, New Mexico ◦ Department of Anthropology, University of Texas at Austin September 1991 to December 1991

Analyzed lithic tool collections from San Francisco and Three Circle phase Mogollon sites on the Gila National Forest.

VOLUNTEER ARCHAEOLOGICAL TECHNICIAN ◦ WS Ranch Project, New Mexico ◦ Department of Anthropology, University of Texas at Austin June 1991

Assisted in test excavations for the Phase II evaluations of San Francisco and Three Circle phase Mogollon sites on the Gila National Forest in advance of the development of an interpretative trail.

VOLUNTEER LITHIC ANALYST ◦ WS Ranch Project, New Mexico ◦ Department of Anthropology, University of Texas at Austin September 1990 to December 1990

Analyzed a lithic tool collection from a Three Circle to Tularosa phase Mogollon site on the Gila National Forest and submitted a report of the analysis.

ARCHAEOLOGICAL TECHNICIAN ◦ Archaeological Research, Inc., Austin, Texas July 1990

Assisted in a Phase I pedestrian inventory survey on the Sitgreaves National Forest, Arizona in advance of a timber sale.

ARCHAEOLOGICAL TECHNICIAN ◦ New World Consultants, Inc., Albuquerque, New Mexico June 1990

Assisted in a Phase I pedestrian inventory survey on the Gila National Forest, New Mexico in advance of a timber sale.

UNDERGRADUATE PARTICIPANT ◦ Archaeological Field School, New Mexico ◦ Department of Anthropology, University of Texas at Austin May 1990 to July 1990

Laid out mapping control networks and assisted in test excavations on a Reserve phase Mogollon site and a Three Circle to Tularosa phase Mogollon site, and assisted in a pedestrian inventory survey of the upper San Francisco River Valley on the Gila National Forest.

TECHNICAL KNOWLEDGE AND SKILLS

CULTURAL RESOURCE AND ENVIRONMENTAL LAW

Expert knowledge of Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470f), as amended, and the regulation that implements Section 106 (36 CFR Part 800). Thorough knowledge of Section 110 of the NHPA and the U.S. Army Corps of Engineers' Appendix C to 33 CFR Part 325. Working knowledge of the Native American Graves Protection and Repatriation Act of 1990, the National Environmental Policy Act of 1969, the Archaeological Resource Protection Act of 1979, the California Environmental Quality Act of 1970, and cultural resource statutes, regulations, and guidelines for the states of California, Hawai`i, Nevada, New Mexico, and Texas.

GEOARCHAEOLOGY

Specialty in geoarchaeology with emphases on processual and historical geomorphology, paleoecology, stratigraphy, pedology, and sedimentology. Strong ability to reconstruct the depositional history and paleoenvironment of archaeological resources at multiple areal scales. Design and implement geoarchaeological data collection strategies. Analyze and interpret resultant data. Analyze and interpret geoarchaeological data from extant field records. Expertise used to provide superior contexts for material culture assemblages and architecture at sites in Hawai`i, Ukraine, and New Mexico.

MAPPING AND SPATIAL ANALYSIS

Five years of professional land surveying experience prior to 1988. Thorough knowledge of principles and techniques of land surveying, of a wide variety of optical instruments, of GPS receivers, and of the integration and manipulation of positional and attribute data from multiple sources in drafting and GIS applications. Expertise used to develop archaeological mapping and GIS programs for projects in California, Ukraine, Belize, Hawai`i, New Mexico, and Texas.

ARCHAEOLOGICAL SURVEY AND EXCAVATION

Archeological survey and excavation experience on sites that represent a wide range of cultures, time periods, and environments. Survey experience in California on nineteenth and twentieth century Karuk sites and late nineteenth to early twentieth century Euroamerican mining sites, in Nevada on Pre-Archaic, Archaic, and Protohistoric Native American sites and mid-nineteenth to early twentieth century railroad, mining, emigrant trail, and homestead sites with European, Euroamerican, and Asian components, in northeastern and southern Texas on Paleoindian, Archaic, Caddoan, and early nineteenth to early twentieth century Euroamerican sites, in western New Mexico and eastern Arizona on Archaic and Mogollon sites, on the Na Pali Coast of Kaua`i, Hawai`i on precontact Native Hawaiian sites and in the southern Crimea, Ukraine on Neolithic, Bronze Age, Greek, Roman, Byzantine, and nineteenth century Russian sites.

Excavation experience in California on late nineteenth to early twentieth century Euroamerican mining sites, early twentieth century Euroamerican homesteads, and a Feather River site with Maidu and Euroamerican components, in western New Mexico on Early Pithouse period, Three Circle, Reserve, and Tularosa phase Mogollon sites, in eastern Belize on the Middle Preclassic to Postclassic Maya site of Colha, on O`ahu, Hawai`i on early postcontact to early twentieth century sites with Native Hawaiian, Chinese, Japanese, European, and Euroamerican components in downtown Honolulu, on the East Loch of Pearl Harbor, and in Nu`uanu Valley, in Washington on an Olcott phase Native American site, and in the southern Crimea, Ukraine on Hellenistic Greek and Roman sites.

Experience in the excavation of adobe and stone architecture, house pits or pithouses, former sites of wooden and grass structures, ancient roadways, hearths, refuse pits, storage pits, and extramural surfaces.

MATERIAL ANALYSES

Experience with a wide range of prehistoric and historic material culture. Analyzed and reported on lithic assemblages from Hawai`i and New Mexico, ceramic assemblages from Ukraine and New Mexico, sediments from Hawai`i, Ukraine, and New Mexico, and fossil pollen from New Mexico. Ability to identify and date archaeological site assemblages with late eighteenth to early twentieth century architectural materials, bottle glass, tin cans, and American, British, Chinese, and Japanese ceramics.

COMPUTER LITERACY

Experience with diverse word processing, spreadsheet, database, drafting, graphics, data processing, and GIS applications on PC (Windows XP) and MacIntosh platforms in networked environments. Word processing applications used include Microsoft Word and WordPerfect. Spreadsheet applications used include Microsoft Excel. Database applications used include Microsoft Access, Quattro Pro, FoxPro, and

MinArk. Drafting applications used include AutoCAD and Surfer. Graphics applications used include CorelDraw. Data processing applications used include PathFinder, SurveyLink, and GeoLink. GIS applications used include ArcView.

Recent Professional Development

Cultural Resource and Environmental Law

ACHP - FHWA Advanced Seminar: Reaching Successful Outcomes in Section 106 Review ◦ Vancouver, Washington ◦ Advisory Council on Historic Preservation, Don Klima and Carol Legard; Federal Highway Administration, Mary Ann Naber October 2007

NEPA Compliance and Cultural Resources ◦ Portland, Oregon ◦ National Preservation Institute, Joe Trnka October 2007

Section 106: How to Negotiate and Write Agreements ◦ Sacramento, California ◦ National Preservation Institute, Claudia Nissley November 2004

Consultation with Indian Tribes on Cultural Resource Issues ◦ Sacramento, California ◦ National Preservation Institute, Thomas F. King and Reba Fuller September 2003

Section 106: How to Negotiate and Write Agreements ◦ The Presidio, San Francisco, California ◦ National Preservation Institute, Thomas F. King May 2002

Introduction to CEQA ◦ Sacramento, California ◦ University of California, Davis, Continuing and Professional Education, Ken Bogdan and Terry Rivasplata July 2000

Technical Archaeology

Introduction to Historic Site Survey, Preliminary Evaluation, and Artifact ID ◦ West Sacramento, California ◦ California Department of Transportation and California Department of Parks and Recreation, Glenn Farris, Larry Felton, Julia Huddleson, Anmarie Medin, Pete Schulz, Judy Tordoff, and Kimberly Wooten September 2006

Principles of Geoarchaeology for Transportation Projects (Course No. 100246). Sacramento, California ◦ California Department of Transportation, Graham Dalldorf, Glenn Gmoser, Jack Meyer, Stephen Norwick, Adrian Praetzellis, and William Silva October 2006

Information Technology and Cultural Resource Management

GIS: Practical Applications for Cultural Resource Projects ◦ Sacramento, California ◦ National Preservation Institute, Deidre McCarthy September 2006

State Government

Introduction to California State Parks ◦ Asilomar, Monterey County, California ◦ California Department of Parks and Recreation and Monterey Peninsula College December 2001

Publications, Reports, Papers, and Workshops

Darcangelo, Jennifer, John Sharp, Michael D. McGuirt, Andrea Galvin, and Clarence Caesar

2004 *Section 106 for Experienced Practitioners: Consulting with the California SHPO (GEV4111).* Course taught on 8 September in Oakland to California Department of Transportation cultural resources personnel and private sector cultural resource consultants (8 hours).

Darcangelo, Jennifer, John Sharp, Michael D. McGuirt, and Andrea Galvin

2005 *How to Consult with the California SHPO*. Workshop presented on 23 April at the 39th Annual Meeting of the Society for California Archaeology, Sacramento, California (6 hours).

Jones & Stokes

1999a *Cultural Resource Inventory Report for Williams Communications, Inc. Fiber Optic Cable System Installation Project, Wendover, Nevada to the California State Line*. Volume 1: Draft Report. July. (JSA 98-358.) Sacramento, California. Prepared for Williams Communications, Inc., Tulsa, Oklahoma.

1999b *Cultural Resources Report for the Williams Communications, Inc. Interstate 80 Fiber Optic Cable System Installation Project*. Volume I. September. (JSA 98-358.) Submitted to Williams Communications, Inc., Tulsa, Oklahoma. On file with the State Historic Preservation Office, Carson City, Nevada.

1999c *Archaeological Site Avoidance and Monitoring Plans for Williams Communications' Fiber Optic Cable Installation In the Union Pacific Railroad Right-of-Way, Doña Ana County to Hidalgo County, New Mexico*. October. (JSA98-379.) Sacramento, California. Prepared for Williams Communications, Inc., Tulsa, Oklahoma.

2001 *Final Phase II Cultural Resource Evaluation for the Kramer Mining District, Edwards AFB, Kern and San Bernardino Counties, California*. Volume I. November. Sacramento, California. On file with the Base Historic Preservation Officer, Edwards AFB, California.

Lebo, Susan A. and Michael D. McGuirt

1997 *Geoarchaeology at 800 Nuuanu: Archaeological Inventory Survey of Site 50-80-14-5496 (TMK1-7-02:02), Honolulu, Hawai`i*. Department of Anthropology, Bishop Museum, Honolulu. (100 pp.) Submitted to Bank of Hawaii, Honolulu. On file with the State Historic Preservation Division, Honolulu.

1998a *Assessments of Stone Architecture: a Case Study from North Hālawa Valley, O`ahu*. Paper presented at the 11th Annual Hawaiian Archaeology Conference of the Society for Hawaiian Archaeology, Kailua-Kona, Hawai`i.

1998b Pili *Grass, Wood Frame, Brick, and Concrete: Archaeology at 800 Nuuanu*. Department of Anthropology, Bishop Museum, Honolulu. (142 pp.) Submitted to Bank of Hawaii, Honolulu. On file with the State Historic Preservation Division, Honolulu.

Lennstrom, Heidi A., P. Christiaan Klieger, Michael D. McGuirt, and Susan A. Lebo

1997 *Archaeological Reconnaissance of Pouhala Marsh, `Ewa District, O`ahu*. Department of Anthropology, Bishop Museum, Honolulu. (14 pp.) Submitted to Ducks Unlimited, Inc., Rancho Cordova, California. On file with the State Historic Preservation Division, Honolulu.

McGuirt, Michael D.

1996 *The Geoarchaeology and Palynology of an Early Formative Pithouse Village in West-Central New Mexico*. Unpublished M.A. thesis, Department of Anthropology, University of Texas at Austin.

1998 50-80-10-2010, 50-80-10-2016, 50-80-10-2088, and 50-80-10-2134. In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vols. 2a and 2b, edited by Department of Anthropology, Bishop Museum, pp. 1–3, 1–44, 1–5, and 1–46. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

2002 Committee Reports, OHP Liaison. *SCA Newsletter* 36(3):4–5.

2004 Committee Reports, OHP Liaison. *SCA Newsletter* 38(2): 7, 38(3):6–8.

2006 Preservation Archaeology. In *California Statewide Historic Preservation Plan: 2006–2010*, edited by Marie Nelson, pp. 8–15. California Department of Parks and Recreation's Office of Historic Preservation, Sacramento. Submitted to the National Park Service, Washington, D.C. On file at the California Office of Historic Preservation, Sacramento.

2008 Dealing with Multi-element Cultural Resources under Section 106. In *Historic Properties Are More Than Meets the Eye: Dealing with Historical Archaeological Resources under the Regulatory Context of Section 106 and CEQA*. Session presented on 25 April at the *33rd Annual California Preservation Conference* of the California Preservation Foundation in Napa, California, moderated by Michelle Messinger and Michael D. McGuirt (1 1/2 hours).

McGuirt, Michael D. and Leigh Ann Garcia

1991 Lithic Stew at Apache Creek: the 1990 Chipped Stone Artifact Collection from LA 2949. In *An Analysis of Lithic Artifacts Recovered During the 1990 Test Excavations at the Apache Creek Site (LA 2949), Gila National Forest, West Central New Mexico*, edited by James A. Neely and Jay R. Peck, pp. 13–61. Department of Anthropology, University of Texas at Austin. Submitted to United States Forest Service. On file at the Gila National Forest Office, Silver City, New Mexico.

McGuirt, Michael D. and Leslie H. Hartzell

1997 50-80-10-2139 and 50-80-10-2459. In *Imu, Adzes, and Upland Agriculture: Inventory Survey Archaeology in North Hālawa Valley, O`ahu*, vols. 2c and 2d, edited by Department of Anthropology, Bishop Museum, pp. 1–17 and 1–5. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

1998 Chapter 1: Introduction. In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vol. 1, edited by Department of Anthropology, Bishop Museum, pp. 1–14. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

McGuirt, Michael D. and Margaret Howard

1995 Prehistoric Background. In *Archeological Survey of Tyler State Park, Smith County, Texas*, edited by Margaret Howard, pp. 16–31. Texas Parks and Wildlife Department, Austin. On file with the Texas Historical Commission, Austin, Texas Antiquities Committee Permit No. 1484.

McGuirt, Michael D. and Shannon P. MacPherron

1998 50-80-10-2137 . In *Activities and Settlement in an Upper Valley: Data Recovery and Monitoring Archaeology in North Hālawa Valley, O`ahu*, vol. 2b, edited by Department of Anthropology, Bishop Museum, pp. 1–86. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

McGuirt, Michael D. and Deborah I. Olszewski

1997 50-80-10-2256. In *Imu, Adzes, and Upland Agriculture: Inventory Survey Archaeology in North Hālawa Valley, O`ahu*, vol. 2d, edited by Department of Anthropology, Bishop Museum, pp. 1–9. Department of Anthropology, Bishop Museum, Honolulu. Submitted to State of Hawaii, Department of Transportation, Honolulu. On file with the State Historic Preservation Division, Honolulu.

Mikesell, Stephen, Michael McGuirt, and Trish Fernandez

2007 Introduction to the White Papers in State Historical Resources Commission Archaeology Committee White Papers. *SCA Newsletter* 41(1):18–21.

Sharp, John, Michael D. McGuirt, Jennifer Darcangelo, and Andrea Galvin

2004 *How to Consult with the California SHPO*. Workshop presented on 18 March at the 38th Annual Meeting of the Society for California Archaeology, Riverside, California (4 hours).

Professional and Honorary Associations

Register of Professional Archaeologists
Society for American Archaeology
Society for California Archaeology
Honor Society of Phi Kappa Phi

References and Writing Samples

Available upon request.

DECLARATION OF
Alvin J. Greenberg, Ph.D.

I**, Alvin J. Greenberg, Ph.D.** declare as follows:

1. I am presently a consultant to the California Energy Commission, Energy Facilities Siting and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on the **Public Health, Hazardous Materials Management, and Worker Safety/Fire Protection** sections for the **Ridgecrest Solar Power Project Application** based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: Original Signature in Dockets

At: Sacramento, California

Risk Science Associates

121 Paul Dr., Suite A, San Rafael, Ca. 94903-2047
415-479-7560 fax 415-479-7563
e-mail agreenberg@risksci.com

Name & Title: **Alvin J. Greenberg, Ph.D., FAIC, REA, QEP**
Principal Toxicologist

Dr. Greenberg has had over two decades of complete technical and administrative responsibility as a team leader in the preparation of human and ecological risk assessments, air quality assessments, hazardous materials handling and risk management/prevention, infrastructure vulnerability assessments, occupational safety and health, hazardous waste site characterization, interaction with regulatory agencies in obtaining permits, and conducting lead surveys and studies. He has particular expertise in the assessment of dioxins, lead, diesel exhaust, petroleum hydrocarbons, mercury, the intrusion of subsurface contaminants into indoor air, and the preparation and review of public health/public safety sections of EIRs/EISs. Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the US EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, the California Air Resources Board Advisory Committee on Diesel Emissions, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is the former Chair of the Bay Area Air Quality Management District Hearing Board, a former member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA. And, since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments, power plant security programs, and conducting safety and security audits of power plants for the California Energy Commission and has assisted the CEC in the assessment of safety and security issues for proposed LNG terminals. In addition to providing security expertise to the State of California, Dr. Greenberg was the Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Years Experience: 26

Education:

B.S. 1969 Chemistry, University of Illinois Urbana

Ph.D. 1976 Pharmaceutical/Medicinal Chemistry, University of California, San Francisco

Postdoctoral Fellowship 1976-1979 Pharmacology/Toxicology, University of California, San Francisco

Postgraduate Training 1980 Inhalation Toxicology, Lovelace Inhalation Toxicology Research Institute, Albuquerque, NM

Professional Registrations:

Board Certified as a Qualified Environmental Professional (QEP)
California Registered Environmental Assessor - I (REA)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

Society for Risk Analysis
Air and Waste Management Association
American Chemical Society
American Association for the Advancement of Science
National Fire Protection Association

Technical Boards and Committee Memberships - Present:

Squaw Valley Technical Review Committee
(appointed 1986)

Technical Boards and Committee Memberships - Past:

July 1996 – March 2002
Member, Bay Area Air Quality Management District Hearing Board
(Chairman 1999-2002)
September 2000 – February 2001
Member, State Water Resources Control Board Noncompliant Underground Tanks Advisory Group
January 1999 – June 2001
Member, California Air Resources Board Advisory Committee on Diesel Emissions
January 1994 - September 1999
Vice-Chairman, State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee
September 1998
Member, US EPA Workgroup on Cumulative Risk Assessment
April 1997 - September 1997
Member, Cal/EPA Private Site Manager Advisory Committee
January 1986 - July 1996
Member, Bay Area Air Quality Management District Advisory Council
(Chairman 1995-96)
January 1988 - June 1995
Member: California Department of Toxic Substance Control Site Mitigation Program Advisory Group
January 1989 - February 1995
Member: Department of Toxics Substances Control Review Committee, Cal-EPA

October 1991 - February 1992
Chair: Pollution Prevention and Waste Management Planning Task Force of the Department of Toxics Substances Control Review Committee, Cal-EPA

September 1990 - February 1991
Member: California Integrated Waste Management Board Sludge Advisory Committee

September 1987 - September 1988
ABAG Advisory Committee on Regional Hazardous Waste Management Plan

March 1987 - September 1987
California Department of Health Services Advisory Committee on County and Regional Hazardous Waste Management Plans

January 1984 - October 1987
Member, San Francisco Hazardous Materials Advisory Committee

March 1984 - March 1987
Member, Lawrence Hall of Science Toxic Substances and Hazardous Materials Education Project Advisory Board

Jan. 1, 1986 - June 1, 1986
Member, Solid Waste Advisory Committee, Governor's Task Force on Hazardous Waste

Jan. 1, 1983 - June 30, 1985
Member, Contra Costa County Hazardous Waste Task Force

Sept. 1, 1982 - Feb. 1, 1983
Member, Scientific Panel to Address Public Health Concerns of Delta Water Supplies, California Department of Water Resources

Present Position

January 1983- present
Owner and principal with Risk Sciences Associates, a Marin County, California, environmental consulting company specializing in multi-media human health and ecological risk assessment, air pathway analyses, hazardous materials management-infrastructure security, environmental site assessments, review and evaluation of EIRs/EISs, preparation of public health and safety sections of EIRs/EISs, and litigation support for toxic substance exposure cases.

Previous Positions

Jan. 2, 1983 - June 12, 1984
Member, State of California Occupational Safety and Health Standards Board (Cal/OSHA), appointed by the Governor

Aug. 1, 1979 - Jan. 2, 1983
Assistant Deputy Chief for Health, California Occupational Safety and Health Administration

Feb. 1, 1979 - Aug. 1, 1979

Administrative Assistant to Chairperson of Finance Committee, Board of Supervisors, San Francisco

Jan. 1, 1976 - Feb. 1, 1979
Research Pharmacologist and Postdoctoral Fellow, Department of Pharmacology and Toxicology, School of Medicine, University of California, San Francisco

Jan. 1, 1975 - Dec. 31, 1975
Acting Assistant Professor, Department of Pharmaceutical Chemistry, University of California, San Francisco

Experience

General

Dr. Greenberg has been a consultant in Hazardous Materials Management and Security, Human and Ecological Risk Assessment, Occupational Health, Toxicology, Hazardous Waste Site Characterization, and Toxic Substances Control Policy for over 26 years. He has broad experience in the identification, evaluation and control of health and environmental hazards due to exposure to toxic substances. His experience includes Community Relations Support and Risk Communication through experience at high-profile sites and presentations at professional society meetings.

He has considerable experience in the review and evaluation of exposure via the air pathway - particularly to emissions from power plants, refineries, and diesel exhaust - and a thorough knowledge of the regulatory requirements through his experience at Cal/OSHA, the BAAQMD Hearing Board, as a consultant to the California Energy Commission, and in preparing such assessments for local government and industry. He has assessed exposures to diesel exhaust during construction and operations of stationary and mobile sources and has testified at evidentiary hearings numerous times on this subject.

He is presently assisting the California Energy Commission in assessing the risks to workers and the public of proposed power plants and LNG terminals in the state. His experience in hazard identification, exposure assessment, risk assessment, occupational safety and health, emergency response, and Critical Infrastructure Protection has made him a valuable part of the CEC team addressing this issue. He has reviewed and commented on the DEIS/DEIR for the proposed SES LNG Port of Long Beach terminal, focusing on security issues for the CEC and on safety matters for the City of Long Beach. He has presented technical information and analysis to the State of California Interagency LNG Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

He served for over five years as the Vice-chair of the California State Water Resources Control Board Advisory Committee convened to address toxic substances in sediments in bays, rivers, and estuaries. He has been a member of the Squaw Valley Technical Review Committee since 1986 establishing chemical application management plans at golf courses to protect surface and

groundwater quality. He has also conducted numerous ecological risk assessments and characterizations, including those for marine and terrestrial habitats.

Dr. Greenberg has extensive experience in data collection and preparation of human and ecological risk assessments on numerous military bases and industrial sites with Cal/EPA DTSC and RWQCB oversight. He has also been retained to provide technical services to the Cal/EPA Department of Toxic Substances Control (preparation of human health risk assessments) and the Office of Environmental Health Hazard Assessment (review and evaluation of air toxics health risk assessments and preparation of profiles describing the acute and chronic toxicity of toxic air contaminants). He has also conducted several surveys of sites containing significant lead contamination from various sources including lead-based paint, evaluated potential occupational exposure to lead dust and fumes in industrial settings, prepared numerous human health risk assessments of lead exposure, and prepared safety and health plans for remedial investigation of lead contaminated soils. Dr. Greenberg is also a recognized expert on the requirements of California's Proposition 65 and has served as an expert on Prop. 65 litigation.

Sites with EPA, RWQCB and/or DTSC Oversight

Dr. Greenberg has specific experience in assessing human health and ecological risks at contaminated sites at the land/water interface, including petroleum contaminants, metals, mercury, and VOCs at several locations in California including Oxnard, Richmond, Avila Beach, Mare Island Naval Shipyard, San Diego, Hollister, San Francisco, Hayward, Richmond, the Port of San Francisco, and numerous other locations. He has used Cal/EPA methods, US EPA methods, and ASTM Risk Based Corrective Action (RBCA) and Cal/Tox methodologies. He is extremely knowledgeable about SWRCB and SF Bay RWQCB regulations on underground storage tank sites and with ecological issues presented by contaminated sediments including sediment analysis, toxicity testing, tissue analysis, and sediment quality objectives. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Dr. Greenberg experience on many of these contaminated sites has been as a consultant to local governments, state agencies, and citizen groups. He assisted the City and County of San Francisco in developing local ordinance requiring soil testing (Article 20, Maher ordinance) and hazardous materials use reporting (Article 21, Walker ordinance). He served as the City of San Rafael's consultant to provide independent review and evaluation of the site characterization and remedial action plan prepared for a former coal gasification site. He was a consultant to a citizen group in northern California regarding exposure and risks due to accidental releases from a petroleum refinery and assisted in the assessment of risks due to crude petroleum contamination of a southern California beach. He has prepared a number of risk assessments addressing crude petroleum, diesel and gasoline contamination, including coordinating site investigations, environmental monitoring, and health risk assessment for the County of San Luis Obispo regarding Avila Beach subsurface petroleum contamination. That high-profile project lasted for over one year and Dr. Greenberg managed a team of experts with a budget of $750,000. Another high-profile project included the preparation of an extensive comprehensive human and ecological risk assessment for the Hawaii Office of Space Industry on rocket launch impacts and transportation/storage of rocket fuels at the southern end of the Big Island of Hawaii. Dr. Greenberg's risk assessments were part of the EIS for the project. Dr. Greenberg also worked on another high-profile project conducting Air Pathway Analysis of off-site and on-site impacts

from landfill gas constituents, including indoor and outdoor air measurements, air dispersion modeling, flux chamber investigations, and health risk assessment for the County of Santa Barbara. Dr. Greenberg has conducted RI/FS work, prepared health risk assessments, evaluated hazardous waste sites and hazardous materials use at numerous locations in California, Hawaii, Oregon, Minnesota, Michigan, and New York. He has considerable experience in the development of clean-up standards and the development of quantitative risk assessments for site RI/FS work at CERCLA sites, as well as site closures, involving toxic substances and petroleum hydrocarbon wastes. He is experienced in working with both Region IX EPA and the State of California DTSC in negotiating clean-up standards based on the application of both site-specific and non site-specific health and ecological based clean-up criteria. He has significant experience in the development of site chemicals of concern list, quantitative data quality levels, site remedial design, the site closure process, the design and execution of data quality programs and verification of data quality prior to its use in the decision making process on large NPL sites.

Examples

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)
The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment, Ecological Screening Evaluation, and Development of Proposed Remediation Goals for the Flair Custom Cleaners Site, Chico, California (January 1996)

Human Health Risk Assessment for the X-3 Extrudate Project at Criterion Catalyst, Pittsburg, Ca. (November 1994)

Screening Health Risk Assessment and Development of Proposed Soil Remediation Levels at Hercules Plant #3, Culver City, Ca. (July 1993)

Ecological Screening Evaluation for the Altamont Landfill, Alameda County, Ca. (June, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawaii (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (March 1993)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca.
(March, 1993)

Screening Health Risk Assessment for the Proposed Expansion of the West Marin Sanitary Landfill, Point Reyes Station, Ca.
(March, 1993)

Health Risk Assessment for the Proposed Expansion of the Forward, Inc. Landfill, Stockton, Ca.
(September 14, 1992)

Health Risk Assessment for the Rincon Point Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency.
(August 10, 1992)

Health Risk Assessment for the South Beach Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency.
(August 10, 1992)

Screening Health Risk Assessment and Development of Proposed Soil and Groundwater Remediation Levels, Kaiser Sand and Gravel, Mountain View, Ca. Prepared for Baseline Environmental Consulting (January 30, 1992)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Preliminary Health Risk Assessment for the City of Pittsburg Redevelopment Agency, Pittsburg, California (May 29, 1991)

Military Bases

Dr. Greenberg has experience in conducting assessments at DOD facilities, including RI/FS work, preparation of health risk assessments, evaluation of hazardous waste sites and hazardous materials use at the following Navy sites in California: San Diego Naval Base; Marine Corps Air-Ground Combat Center, 29 Palms; Mare Island Naval Shipyard, Vallejo; Treasure Island Naval Station, San Francisco, Hunters Point Naval Shipyard, San Francisco, and the Marine

Corps Logistics Base, Barstow. He worked with the U.S. Navy and the U.S. EPA in the implementation of Data Quality Objectives (DQO's) at MCLB, Barstow.

Examples

Review and Evaluation of the Remedial Investigation Report and Human Health Risk Assessment for the U. S. Naval Station at Treasure Island, Ca. (June 1999)

Screening Health Risk Assessment for the Proposed San Francisco Police Department's Helicopter Landing Pad at Hunters Point Shipyard, San Francisco, Ca. (September 1997)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Health Risk Assessment for the Chrome Plating Facility, Mare Island Naval Shipyard, Vallejo, California (October 24, 1988)

Background Levels and Health Risk Assessment of Trace Metals present at the Naval Petroleum Reserve No.1, 27R Waste Disposal Trench Area, Lost Hills, California (August 12, 1988)

RCRA Facility Investigation (RFI) Work Plan of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 14, 1989)

Hazardous Waste and Solid Waste Audit and Management Plan, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (July 3, 1989)

Water Quality Solid Waste Assessment Test (SWAT) Proposal RCRA Landfill, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (October 31, 1988)

Waste Disposal Facilities, Waste Haulers, Waste Recycling Facilities Report, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 22, 1988)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Air Quality Solid Waste Assessment Test (SWAT) Proposal, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 25, 1988)

Liquefied Natural Gas (LNG)

Dr. Greenberg assisted the CEC in the preparation of the "background" report on the risks and hazards of siting LNG terminals in California ("LNG in California: History, Risks, and Siting" July 2003) and consulted for the City of Vallejo on a proposed LNG terminal and storage facility at the former Mare Island Naval Shipyard. He has also conducted an evaluation and prepared comments on the risks, hazards, and safety analysis of the DEIS/DEIR for the City of Long

Beach on a proposed LNG terminal at the Port of Long Beach (POLB) and conducted an analysis on vulnerability and critical infrastructure security for the CEC on this same proposed LNG terminal. He currently advises the CEC on the POLB LNG proposal on risks, hazards, human thresholds of thermal exposure, vulnerability, security, and represented the CEC at a U.S. Coast Guard briefing on the Waterway Suitability Assessment that included the sharing of SSI (Sensitive Security Information). He has presented technical information and analysis to the State of California LNG Interagency Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

Infrastructure Security

Since 2002, Dr. Greenberg has been trained by and is working with the Israeli company SB Security, LTD, the most experienced and tested security planning and service company in the world. Since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments and power plant security programs for the California Energy Commission (CEC). In taking the lead for this state agency, Dr. Greenberg has interfaced with the California Terrorism Information Center (CATIC) and provided analysis, recommendations, and testimony at CEC evidentiary hearings regarding the security of power plants within the state. These analyses include the assessment of Critical Infrastructure Protection, threat assessments, criticality assessments, and the preparation of vulnerability assessments and off-site consequence analyses addressing the use, storage, and transportation of hazardous materials, recommendations for security to reduce the threat from foreign and domestic terrorist activities, perimeter security, site access by personnel and vendors, personnel background checks, management responsibilities for facility security, and employee training in security methods. Dr. Greenberg is the lead person in developing a model power plant security plan, vulnerability assessment matrix, and a security training manual for the CEC. The model security plan is used by power plants in California as guidance in developing and implementing security measures to reduce the vulnerability of California's energy infrastructure to terrorist attack. He has testified at several evidentiary hearings for the CEC on power plant security issues. He also leads an audit team conducting safety and security audits at power plants throughout California that are under the jurisdiction of the CEC. In addition to providing security expertise to the State of California, in August 2004, a team of experts led by Dr. Greenberg was awarded an 18-month contract by the State of Hawaii to update and improve the state's Energy Emergency Preparedness Plan and make recommendations for increased security of critical energy infrastructure on this isolated group of islands.

Air Pathway Analysis

Dr. Greenberg has prepared numerous Air Pathway Analyses and human health risk assessments, evaluating exposure at numerous locations in California, Hawai'i, Oregon, Minnesota, Michigan, and New York. He is experienced in working with Region IX EPA, the State of California DTSC, and the Hawai'i Department of Health Clean Air Branch in the application of both site-specific and non site-specific health risk assessment criteria.

Examples

Human Health Risk Assessment for the Open Burn/Open Detonation Operation at McCormick Selph, Inc., Hollister, Ca. (June 2003)

Air Quality and Human Health Risk Assessment for the Royal Oaks Industrial Complex, Monrovia, Ca. (January 2003)

Human Health Risk Assessment and Indoor Vapor Intrusion Assessment for the former Pt. St. George Fisheries Site, Santa Rosa, Ca. (October 2002)

Human Health Risk Assessment for the former Sargent Industries Site, Huntington Park, Ca. (July 2001)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca.
(March, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawai'i (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (March 1993)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Cancer Risk Assessment for the H-Power Generating Station, Campbell Industrial Park, Oahu, Hawai'i (1988)

Hazardous Materials Assessments, Waste Management Assessments, Worker Safety and Fire Protection Assessments, and Public Health Impacts Assessments

Dr. Greenberg also has significant experience as a consultant and expert witness for the California Energy Commission providing analysis, recommendations, and testimony in the areas of hazardous materials management, process safety management, waste management, worker safety and fire protection, and public health impacts for proposed power plant/cogeneration facilities. These analyses include the evaluation and/or preparation of the following:

- Off-site consequence analyses of the handling, use, storage, and transportation of hazardous materials,
- Risk Management Plans (required by the Cal-ARP) and Business Plans (required by H&S Code section 25503.5),
- Safety Management Plans (required by 8 CCR section 5189),
- Natural gas pipeline safety,
- Solid and hazardous waste management plans,
- Phase I and II Environmental Site Assessments,
- Construction and Operations Worker Safety and Health Programs,
- Fire Prevention Programs,
- Human health risk assessment from stack emissions and from diesel engines, and
- Mitigation measures to address PM exposure, including diesel particulates

Examples

- Almond 2 Power Plant Project, City of Ceres, Ca. 2009 – present. Public health.
- Watson Cogeneration Steam and Electric Reliability Project, Carson, Ca. 2009 – present. Public health.
- Hanford Combined-Cycle Power Plant (amendment), Kings County, Ca. 2008 – present. Public health.
- Henrietta Combined-Cycle Power Plant (amendment), Kings County, Ca. 2008 – present. Public health.
- Lodi Energy Center, Lodi, Cal. 2008 – present. Hazardous materials management, worker safety/fire protection.
- Marsh Landing Generating Station, City of Antioch, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection.
- Palmdale Hybrid Power Plant, Palmdale, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- Stirling Energy Systems Solar 1 Project, San Bernardino County, Ca. 2008 – present. Public health.
- Stirling Energy Systems Solar 2 Project, Imperial County, Ca. 2008 – present. Public health.
- San Joaquin Solar 1&2, Fresno County, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- GWF Tracy Combined Cycle Power Plant, Tracy, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- CPV Vaca Station Power Plant, Vacaville, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection.

- Willow Pass Generating Station, Pittsburg, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, waste management.
- Avenal Energy Power Plant, Avenal, Ca. 2008 – 2009. Worker safety/fire protection, public health.
- Orange Grove Energy, San Diego County, Ca. 2008-2009. Public health.
- Riverside Energy Resource Center Units 3&4, Riverside, Ca. 2008 – 2009. Hazardous materials management.
- Canyon Power Plant, Anaheim, Ca. 2007 – present. Hazardous materials management, worker safety/fire protection, public health.
- Carlsbad Energy Center, Carlsbad, Ca. 2007 – present. Hazardous materials management, worker safety/fire protection, public health.
- Ivanpath Solar Electric Generating System, San Bernardino County, Ca. 2007 – present. Public health.
- Kings River Conservation District Community Power Project, City of Parlier, Ca. 2007 – 2009. Hazardous materials management, worker safety/fire protection.
- Chula Vista Energy Upgrade Project, Chula Vista, Ca. 2007 – 2009. Hazardous materials management, worker safety/fire protection.
- Chevron Richmond Power Plant Replacement Project, Richmond, Ca. 2007 – 2008. Hazardous materials management, public health.
- Humboldt Bay Generating Station, Eureka, Ca. 2006 – 2008. Hazardous materials management, worker safety/fire protection, waste management.
- El Centro Power Plant – Unit 3 Repower Project, El Centro, Ca. 2006 – 2007. Public health.
- San Francisco Energy Reliability Project, San Francisco, Ca. 2004 – 2006. Hazardous materials management, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Malburg Generating Station Project, City of Vernon, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Blythe II, Blythe, Ca. 2002-3. hazardous materials, worker safety/fire protection,
- Palomar Energy Center, Escondido, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Project, Rancho Seco, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Project, Tesla, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- San Joaquin Valley Energy Center, San Joaquin, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management
- Morro Bay Power Plant, Morro Bay, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Potrero Power Plant Unit 7, San Francisco, Ca., 2001-2: hazardous materials, worker safety/fire protection
- El Segundo Power Redevelopment Project, El Segundo, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Rio Linda Power Project, Rio Linda, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health

- Pastoria II Energy Facility Expansion, Grapevine, Ca., 2001: hazardous materials, worker safety/fire protection
- East Altamont Energy Center, Byron, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Magnolia Power Project, Burbank, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Russell City Energy Center, Hayward, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Woodbridge Power Plant, Modesto, Ca., 2001: hazardous materials, worker safety/fire protection, waste management
- Colusa Power Plant Project, Colusa County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Valero Refinery Cogeneration Project, Benicia, Ca., 2001: hazardous materials, worker safety/fire protection
- Ocotillo Energy Project, Palm Springs, Ca., 2001: hazardous materials, worker safety/fire protection
- Gilroy Energy Center Phase II Project, Gilroy, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Los Esteros Critical Energy Facility, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Roseville Energy Facility, Roseville, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Spartan Power, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- South Star Cogeneration Project, Taft, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Plant, Eastern Alameda County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tracy Peaker Project, Tracy, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Henrietta Peaker Project, Kings County, Ca., 2001: hazardous materials, worker safety/fire protection, waste management, public health
- Central Valley Energy Center, San Joaquin, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Plant, Rancho Seco, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Los Banos Voltage Support Facility, Western Merced County, Ca., 2001-2: waste management, public health
- Palomar Energy Project, Escondido, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Metcalf Energy Center, San Jose, Ca., 2000-1: hazardous materials
- Blythe Power Plant, Blythe, Ca., 2000-1: hazardous materials
- San Francisco Energy Co. Cogeneration Project, San Francisco, Ca., 1994-5: hazardous materials

- Campbell Soup Cogeneration Project, Sacramento, Ca., 1994: hazardous materials
- Proctor and Gamble Cogeneration Project, Sacramento, Ca., 1993-4: hazardous materials
- San Diego Gas and Electric South Bay Project, Chula Vista, Ca., 1993: hazardous materials
- SEPCO Project, Rio Linda, Ca., 1993: hazardous materials
- Shell Martinez Manufacturing Complex Cogeneration Project, Martinez, Ca., 1993: hazardous materials and review and evaluation of EIR

Occupational Safety and Health/Health and Safety Plans/Indoor Air Quality

Dr. Greenberg has significant experience in occupational safety and health, having directed the development, adoption, and implementation of over 50 different Cal/OSHA regulations, including airborne contaminants (>450 substances), lead, asbestos, confined spaces, and worker-right-to-know (MSDSs). He has conducted numerous occupational health surveys and has extensive experience in the sampling and analysis of indoor air quality at residences, workplaces, and school classrooms. He is currently the team leader conducting safety and security audits at power plants throughout California for the California Energy Commission. Safety issues audited include compliance with regulations addressing several safety matters, including but not limited to, confined spaces, lockout/tagout, hazardous materials, and fire prevention/suppression equipment.

Examples

Review and Evaluation of Public and Worker Safety Issues at the proposed SES LNG Facility, Port of Long Beach. prepared for the City of Long Beach. (November 2005)

Confidential safety and security audit reports for 18 power plants in California. prepared for the California Energy Commission. (January 2005 through March 2006)

Report on the Accidental release and Worker Exposure to Anhydrous Ammonia at the BEP I Power Plant, Blythe, Ca. prepared for the California Energy Commission. (October 2004)

Investigation of a Worker Death in a Confined Space, La Paloma Power plant. prepared for the California Energy Commission. (July 2004)

Preliminary Report on Indoor Air Quality in Elementary School Portable Classrooms, Marin County, Ca. (December 1999)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Air Pathway Analysis for the Ballard Canyon Landfill. Submitted to the County of Santa Barbara, (March 1999)

Review and Evaluation of the Health Risk Assessment for Outdoor and Indoor Exposures at the Former Golden Eagle Refinery Site, Carson, Ca. (May 1998)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Determination of Occupational Lead Exposure at a Tire Shop in Placerville, Ca. (April 1993)

Development of an Environmental Code of Regulations for Hazardous Waste Treatment Facilities on La Posta Indian Tribal lands, San Diego County, Ca. (August 1992)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Mercury Contamination

Dr. Greenberg has prepared and/or reviewed several human health and ecological risk assessments regarding mercury contamination in soils, sediments, and indoor surfaces. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Examples

Review and evaluation of a human health risk assessment of ingestion of sport fish caught from San Diego Bay and which contain tissue levels of mercury and PCBs (November 2004 – present)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

DECLARATION OF

I, **Rick Tyler**, declare as follows:

1. I am presently employed by The California Energy Commission in the Engineering Office of the Siting, Transmission, and Environmental Protection Division as a Senior Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I supervised preparation of the staff testimony on Hazardous Materials Management and Worker Safety Fire Protection Sections, for the Almond 2 Power Plant Project, based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/20/10 Signed: Original Signature in Dockets

At: Sacramento, California

RICK TYLER

Associate Mechanical Engineer

CALIFORNIA ENERGY COMMISSION

EDUCATION B.S., Mechanical Engineering, California State University, Sacramento. Extra course work in Statistics, Instrumentation, Technical Writing, Management; Toxicology, Risk Assessment, Environmental Chemistry, Hazardous Materials Management, Noise Measurement, and regulations regarding control of toxic substances.

Near completion of course work necessary to obtain a certificate in hazardous materials management from University of California, Davis.

EXPERIENCE

Jan. 1998-Present

California Energy Commission - Senior Mechanical Engineer
Energy Facility Siting and Environmental Protection Division

Responsible for review of Applications for Certification (applications for permitting) for large power plants including the review of handling practices associated with the use of hazardous and acutely hazardous materials, loss prevention, safety management practices, design of engineered equipment and safety systems associated with equipment involving hazardous materials use, evaluation of the potential for impacts associated with accidental releases and preparation and presentation of expert witness testimony and conditions of certification. Review of compliance submittals regarding conditions of certifications for hazardous materials handling, including Risk Management Plans Process Safety Management.

April 1985-Jan. 1998

California Energy Commission - Health and Safety
Program Specialist; Energy Facility Siting and Environmental Protection Division.

Responsible for review of Public Health Risk Assessments, air quality, noise, industrial safety, and hazardous materials handling of Environmental Impact Reports on large power generating and waste to energy facilities, evaluation of health effects data related to toxic substances, development of recommendations regarding safe levels of exposure, effectiveness of measures to control criteria and non-criteria pollutants, emission factors, multimedia exposure models. Preparation of testimony providing Staff's position regarding public health, noise, industrial safety, hazardous materials handling, and air quality issues associated with proposed power plants. Advise Commissioners, Management, other Staff and the public regarding issues related to health risk assessment of hazardous materials handling.

Nov. 1977-
April 1985

California Air Resources Board - Engineer (last 4 years Associate level)

Responsible for testing to determine pollution emission levels at major industrial facilities; including planning, supervision of field personnel, report preparation and case development for litigation; evaluate, select and acceptance-test instruments prior to purchase; design of instrumentation systems and oversight of their repair and maintenance; conduct inspections of industrial facilities to determine compliance with applicable pollution control regulations; improved quality assurance measures; selected and programmed a computer system to automate data collection and reduction; developed regulatory procedures and the instrument system necessary to certify and audit independent testing companies; prepared regulatory proposals and other presentations to classes at professional symposia and directly to the Air Resources Board at public hearings. As state representative, coordinated efforts with federal, local, and industrial representatives.

PROFESSIONAL AFFILIATIONS/ LICENSES

Past President, Professional Engineers in California Government Fort Sutter Section;
Past Chairman, Legislative Committee for Professional Association of Air Quality Specialists. Have passed the Engineer in Training exam.

PUBLICATIONS, PROFESSIONAL PRESINTATIONS AND ACCOMPLISHMENTS

Authored staff reports published by the California Air Resources Board and presented papers regarding continuous emission monitoring at symposiums.

Authored a paper entitled "A Comprehensive Approach to Health Risk Assessment", presented at the New York Conference on Solid Waste Management and Materials Policy.

Authored a paper entitled "Risk Assessment A Tool For Decision Makers" at the Association of Environmental Professionals AEP Conference on Public Policy and Environmental Challenges.

Conducted a seminar at University of California, Los Angeles for the Doctoral programs in Environmental Science and Public Health on the subject of "Health Risk Assessment".

Authored a paper entitled "Uncertainty Analysis -An Essential Component of Health Risk Assessment and Risk Management" presented at the EPA/ORNL expert workshop on Risk Assessment for Municipal Waste Combustion: Deposition, Uncertainty, and Research Needs.

Presented a talk on off-site consequence analysis for extremely hazardous materials releases. Presented at the workshop for administering agencies conducted by the City of Los Angeles Fire Department.

Evaluated, provided analysis and testimony regarding public health and hazardous materials management issues associated with the permitting of more than 20 major power plants throughout California.

Developed Departmental policy, prepared policy documents, regulations, staff instruction, and other guidance documents and reference materials for use in evaluation of public health and hazardous materials management aspects of proposed power plants.

Project Manager on contracts totaling more than $500,000.

RES.RT

DECLARATION OF
Jeanine Hinde

I, **Jeanine Hinde**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission, and Environmental Protection Division as a Planner I.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Land Use** for the Almond 2 Project based on my independent analysis of the application and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 21, 2010 Signed: Original Signature in Dockets

At: Sacramento, California

JEANINE M. HINDE

Professional Experience

Planner **February 2010–Present**
California Energy Commission, Sacramento, CA
Environmental Office of the Siting, Transmission, and Environmental Protection Division

Generalist skilled in research and analysis, and in preparing environmental assessments relating to the siting of a variety of power plant projects filed with the Energy Commission. Analyzes project-related impacts to land use, agricultural resources, and visual/aesthetic resources. Evaluates project conformance with applicable laws, ordinances, regulations, and standards. Recommends appropriate mitigation measures to reduce project effects on environmental resources. Recently prepared the land use analyses for a 159-megawatt (MW) geothermal power plant in Imperial County and a 174-MW electrical generating plant in Ceres.

Environmental Analyst **2004–2009**
EDAW-AECOM, Sacramento, CA

Coordinated preparation of environmental studies to satisfy the California Environmental Quality Act (CEQA) and the National Environmental Policy Act and related permitting and regulatory requirements. Contributed to the preparation of regulatory compliance documents for projects that have addressed flood protection, wastewater management, water quality, habitat restoration, and urban development. As an assistant project manager, contributed to the preparation, technical review, and distribution of a variety of environmental compliance documents for projects that included a levee repair project on the Feather and Yuba Rivers, a levee seepage project on the San Joaquin River near the Sacramento-San Joaquin Delta (Delta), a wastewater treatment plant improvement project in Atwater, and a habitat restoration project adjacent to the middle Sacramento River. As an analyst, prepared environmental impact analyses for resource topics that included land use; agricultural resources; visual/aesthetic resources; public services, utilities and service systems; hazardous materials; recreation; and geology, soils, and mineral resources. Prepared mitigation monitoring and reporting program documents and assisted with fulfilling CEQA noticing and filing requirements.

Environmental Analyst **2003–2004**
Sackheim Consulting, Fair Oaks, CA

Researched and wrote the aesthetics analyses for the CEQA documents on related neighborhood electrical distribution projects in the Natomas and Elkhorn areas of Sacramento. Prepared a similar analysis for a project in Elk Grove. Assisted with the analyses addressing potential impacts to cultural resources and to hazards and hazardous materials.

Environmental Specialist II **1986–1997**
Jones & Stokes Associates, Sacramento, CA

Evaluated impacts to land use, visual resources, and recreation for several state and federal projects, including a water supply management program in the East Bay, a project addressing long-term management of resources in the Delta and Suisun Marsh, and a military operations project at Camp Roberts. Provided technical review and coordinated preparation of report sections prepared by staff, and assisted with research and documentation of required federal, state, and local permits and approvals for inclusion in regulatory compliance plans.

Education

B.A. Geography, California State University, Chico

DECLARATION OF
Erin Bright

I**, Erin Bright,** declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Siting Transmission and Environmental Protection Division as a **Mechanical Engineer**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Facility Design** and **Noise and Vibration** for the **Almond 2 Power Plant Project** based on my independent analysis of the Application, supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 7, 2010 Signed: Original Signature in Dockets

At: Sacramento, California

Erin Bright
Mechanical Engineer

Experience Summary

Two years of experience in the electric power generation field, including analysis of noise pollution, construction/licensing of electric generating power plants, and engineering and policy analysis of thermal power plant regulatory issues. One year of experience in the alternative energy field, including analysis of alternative fuel production and use.

Education

- University of California, Davis--Bachelor of Science, Mechanical Engineering and Materials Science
- University of California, Davis Extension Program--Renewable Energy Systems

Professional Experience

2007 to Present-- Mechanical Engineer, Energy Facilities Siting Division - California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

2006 to 2007--Energy Analyst, Fuels & Transportation Division - California Energy Commission

Performed analysis of use potential and environmental effects of emerging non-petroleum fuels, including compressed natural gas, biomass, hydrogen and electricity, in heavy and light duty transportation vehicles. Contributor to Energy Commission's alternative fuels plan.

DECLARATION OF
Kristin Ford

I, Kristin Ford declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Energy Facilities Siting Division as a Planner I.

2. I prepared staff testimony for the Almond 2 Power Plant Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

3. The information in the project description is correct, as the subject site is owned by Turlock Irrigation District.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/5/10 Signed: Original Signature in Dockets

At: Sacramento, California

Kristin S. Ford

Experience

Environmental Planner November 2009 to Present
California Energy Commission, Sacramento, California

- Conduct CEQA-equivalent environmental review for proposed and existing power plants.
- Write analysis for Socioeconomics, Traffic, Visual Resources and Land Use sections for staff assessments.
- Provide expert witness testimony on Socioeconomics, Traffic, Visual Resources and Land Use issues at Energy Commission hearings.

Assistant Planner June 2006 to July 2009
City of Sacramento, Environmental Planning Services, Sacramento, California

- Evaluated, prepared and supervised the preparation of a variety of environmental documents under the California Environmental Quality Act (CEQA); analyzed data and made recommendations on complex planning matters involving issues related to land use, traffic, utilities, aesthetics, noise, energy, historic preservation, air quality and biological resources.
- Prepared, researched and reviewed Mitigation Monitoring Plans per CEQA, the California State & Federal Endangered Species Acts (CESA & FESA), the Clean Water Act (CWA), the Migratory Bird Treaty Act (MBTA) and the Natomas Basin Habitat Conservation Plan.
- Conducted biological resources site assessments for proposed development projects. Determined the need for preparation and/or review of specific studies, such as Wetland Delineations, Nesting Raptor Surveys, and Arborist Reports, to identify resources and provide mitigation measures.
- Coordinated the release of the City of Sacramento's 2030 General Plan Draft/Final Environmental Impact Report between various City departments, the Planning Commission, City Council and the consultant team.

Environmental Coordinator August 2005 to June 2006
Nella Oil Company, Auburn, California

- Coordinated company-wide environmental regulatory compliance activities, including:
  - site investigations;
  - underground fuel-storage tank environmental compliance recommendations and subsequent tank upgrades; and
  - hazardous waste removal.
- Maintained and managed Air Quality Management District and Environmental Health Department permits for 60+ gas stations.

Student Assistant March 2005 to August 2005
California Energy Commission, Sacramento, California

- Conducted research and provided technical writing support to Biology and Water Departments for the annual Energy Policy Report impact analyses.
- Maintained and managed compliance files on power plant facilities.

Student Assistant June 2004 to March 2005
Central Valley Regional Water Quality Control Board, Sacramento, California

- Supported National Pollutant Discharge Elimination System (NPDES) staff by:
  - maintaining waste water treatment plant discharge self-monitoring reports and case files; and
  - analyzed (Amador, Sutter, Placer and Yolo county) wastewater treatment plant monthly monitoring reports for possible permit violations.

Education

2005 Bachelor of Arts, Environmental Studies, *California State University, Sacramento*
2001 Associate of Arts, Liberal Studies, *Allan Hancock College, Santa Maria, California*

DECLARATION OF
Vince Geronimo, PE

I, Vince Geronimo, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Energy Facilities Siting Division as a Soil & Water Resources Specialist.

2. I helped prepare the staff testimony on Soil & Water Resources, for the Almond 2 Power Plant Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

3. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

4. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 6, 2010 Signed: Original Signature in Dockets

At: Sacramento, California

Vince C. Geronimo, PE, CFM

Associate Principal

Vince Geronimo is a registered California Professional Civil Engineer with 14 years of experience in the field of civil, environmental, and water resources engineering. Mr. Geronimo specializes in the planning, design, and implementation of flood mitigation projects that integrate ecosystem restoration. As part of PWA's fluvial team Mr. Geronimo provides technical QA/QC review of hydrologic and hydraulic analyses. Mr. Geronimo manages PWA's IDIQ contract with FEMA Region IX. For the California Energy Commission, Mr. Geronimo has conducted CEQA analysis, recommended mitigation measures, and contributed to Staff Assessments on four siting cases. Mr. Geronimo has conducted various environmental compliance reviews for more than 20 energy facilities. His education and project experience includes wastewater treatment facility design, water transmission and storage analysis, economic analysis, sediment and erosion control planning, stream and wetland restoration, and design of hydraulic structures. As a Certified Floodplain Manager and an engineer, Mr. Geronimo is knowledgeable of methods, to employ, that help reduce flood losses and protect and enhance the natural resources and functions of floodplains.

Education	M.S., 2004	Civil Engineering, Water Resources Emphasis, University of Colorado - Denver, Colorado
	B.S., 1995	Civil Engineering, Environmental Emphasis, Southern Illinois University - Edwardsville, Illinois
Professional Registration	2001 2006	Professional Engineer, State of Colorado, 35224 Civil Engineer, State of California, 70165
Certifications	2002	Certified Floodplain Manager, Certificate No. US-02-00543, Association of State Floodplain Managers
Memberships		American Society of Civil Engineers Environmental & Water Resources Institute of ASCE-Sacramento (Treasurer) Association of State Floodplain Managers Floodplain Managers Association

Selected Project Experience

Beacon Solar Energy Plant; Kern County, CA 2005 -Present. PWA Project Manager provided environmental review for the California Energy Commission of a proposed solar energy plant in the Mojave desert. The environmental review focused on the stormwater, BMPs, and flood related impacts. Mr. Geronimo conducted hydrologic, hydraulic, and geomorphic analyses to assess the project plan to divert an existing dry wash through a constructed earthen diversion channel. Mr. Geronimo provided environmental review of the Storm Water Pollution Prevention Plan and the Drainage Erosion and Sediment Control Plan (DESCP). Mr. Geronimo authored the stormwater and flood related portions of the Preliminary Staff Assessment which included an engineer's evaluation of the project in a separate appendix.

GWF Tracy; Tracy, CA 2008 – Present. PWA Project Manager provided environmental review of a proposed combined-cycle power plant in the City of Tracy for the California Energy Commission. The environmental review focused on the impacts to soil and water use. Mr. Geronimo specifically reviewed the project's proposed stormwater related facilities, BMPs, the septic facility, and water use to evaluate potential soil and water impacts. Mr. Geronimo conducted an assessment of the availability of recycled water and provided oversight for the Soil and Water Section of the Preliminary Staff Assessment.

Compliance Reviews; Throughout California. 2006 – Present. PWA Project Manager responsible for compliance reviews for the California Energy Commission. Mr. Geronimo is a technical reviewer for Soil & Water and Waste compliance submittals. Mr. Geronimo reviews Storm Pollution Prevention Plans (SWPPPs), Drainage Erosion and Sediment Control Plans (DESCP), water use, monthly/annual compliance reports, and flood related compliance submittals to determine if the Project remains in compliance with the Conditions of Certification specified in the Energy Commission's licensing decision.

Selected Project Experience
(Continued)

San Francisco Electric Reliability Plant; San Francisco, CA 2005 -Present. PWA Assistant Project Manager provided environmental review of a proposed power plant in San Francisco for the California Energy Commission. The environmental review was focused on the impacts to soil and water use. Mr. Geronimo specifically reviewed potential flooding, water reclamation and re-use, tertiary wastewater treatment facility, water quality impacts related soil erosion, and the Storm Water Pollution Prevention Plan and storm water best management practices.

Inland Empire Energy Center; Romoland, CA 2005. PWA Assistant Project Manager provided environmental review of a proposed power plant in Romoland for the California Energy Commission. The environmental review was focused on the impacts to soil and water use. Specific analyses included assessing potential flooding, water quality impacts related soil erosion, and the Storm Water Pollution Prevention Plan and storm water BMPs.

South Bay Salt Ponds Restoration Project, For the California State Coastal Conservancy, 2004 – 2008. PWA Task Manager for the riverine analysis of the Guadalupe River/Alviso Slough system. The analysis supported the EIR/S documentation for the South Bay Salt Pond Restoration Project NEPA/CEQA environmental review processes. The analysis combined a steady-state HEC-RAS model and an unsteady UNET model to test a combination of flooding scenarios related to the project alternatives that reduce offline storage and improve conveyance. The South Bay project is approximately 15,000 acres and will restore and enhance wetland habitats, improve public access and reduce flood hazards.

Independent QA/QC Review; FEMA Region IX, 2005 - 2008, PWA Project Manager responsible for developing the QA/QC procedures and checklist to provide independent review of three FEMA Flood Insurance Restudies within Monterey County, Siskiyou County, and Placer County. The independent technical review was conducted in accordance with the established policy principles and procedures in the *Guidelines and Specifications for Flood Hazard Mapping Partners*. The technical review included: Topographic Data, Hydrologic Data, Hydraulic Data, Floodplain Mapping (Revised Areas), as well as secondary checks of the data submitted as part of the TSDN for each re-study.

Flood Insurance Re-Studies; **FEMA Region IX**, 2007 - Present, PWA Project Manager responsible for managing a Marin County (Ross Valley) and a Santa Cruz County (Watsonville) Flood Insurance Re-study of several creeks in the study areas. The re-studies include: field survey, topographic mapping, hydrologic and hydraulic modeling, flood hazard assessment, and floodplain mapping.

Newhall Ranch Development, Valencia, CA, 2006-2008. For Newhall Land and Farming Company. Led the hydraulic assessment and conceptual civil design for improving five tributaries of the Santa Clara River that will be subject to hydromodification. Mr. Geronimo developed a suite of channel stabilization and bank stabilization application methods and design criteria to achieve stable channel morphology in response to reductions in sediment delivery and increases in flow.

Contra Costa Clean Water Program Hydrograph Modification Management Plan – Project Engineer, 2006-2007; for Contra Costa Clean Water program. Mr. Geronimo was part of the consultant team to assist the Contra Costa Clean Water Program in developing a Hydrograph Modification Management Plan (HMP). The HMP will include standards and performance criteria for hydrograph modification management by new development projects. Mr. Geronimo was involved in developing engineering concepts and practical civil design for Integrated Maintenance Practices (IMP).

Lake Sonoma Water Diversion; Sonoma County, CA 2005, PWA Project Manager to study feasibility of diverting water from Lake Sonoma, to the Russian River. The purpose of the analysis was for an EIR scoping process. Mr. Geronimo performed a reconnaissance level, engineering evaluation and provided an approximate cost to deliver 26,000 acre-feet of water from Lake Sonoma to the Russian River. The summary cost estimate included: facilities cost, approximate electrical demand engineering costs as percentage of facilities cost.

DECLARATION OF
Rachel Cancienne, EIT

I, Rachel Cancienne, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Energy Facilities Siting Division as a Soil & Water Resources Specialist.

2. I helped prepare the staff testimony on Soil & Water Resources, for the Almond 2 Power Plant Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

3. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

4. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 6, 2010 Signed: Original Signature in Dockets

At: Sacramento, California

Rachel M. Cancienne, MS

Hydrologist

Ms. Cancienne is a hydraulic and environmental engineer with experience in river dynamics and streambank stability. She received her Master of Science degree in Biosystems Engineering with an emphasis in Natural Resources from Oklahoma State University, where she was a student of Dr. Garey Fox. She conducted laboratory research on simulated streambanks and used numerical modeling through USDA-ARS National Sedimentation Laboratory software to study streambank stability. Since joining PWA's Fluvial Team, she has focused on hydraulic modeling and soil and water analyses for the California Energy Commission.

Education

M.S. 2008 — Biosystems and Agricultural Engineering
Emphasis in Environment and Natural Resources
Oklahoma State University, Stillwater, OK

B.S. 2006 — Biosystems and Agricultural Engineering
Oklahoma State University, Stillwater, OK

Certifications

Engineer in Training (EIT), OK License: EI 13655

Honors/Awards

Tau Beta Pi Engineering Honor Society, 2006—2008
Alpha Epsilon, Biosystems Engineering Honor Society, 2005—2008
National Society of Collegiate Scholars, 2003—2008
Phi Eta Sigma Freshman Honor Society, 2002—2003
Boy Scouts of America Venturing Leadership Award, 2002

Selected Project Experience

GWF Tracy; Tracy, CA 2008 – Present. Ms. Cancienne provided environmental review of a proposed combined-cycle power plant in the City of Tracy for the California Energy Commission. The environmental review focused on the impacts to soil and water use and included writing a Staff Assessment. Ms. Cancienne specifically reviewed the project's proposed stormwater related facilities, BMPs, and water use to evaluate potential soil and water impacts. Ms. Cancienne provided extensive written input for the Soil and Water Section of the Preliminary Staff Assessment.

Almond 2 Power Plant, Turlock Irrigation District, Turlock, CA 2009 - Present. Ms. Cancienne provided environmental review for a proposed power plant project by the Turlock Irrigation District for the California Energy Commission. The environmental review focused on the impacts to soil and water use, submittal and review of data requests, and included writing a Staff Assessment. Ms. Cancienne specifically reviewed the project's proposed stormwater related facilities, BMPs, and water use to evaluate potential soil and water impacts. Ms. Cancienne provided extensive written input for the Data Requests and Soil and Water Section of the Preliminary Staff Assessment.

DWR-San Joaquin Non-Urban Levees, San Joaquin Valley, CA, 2008 – present. Hydrologist. Ms. Cancienne reviewed and digitized historic topographic maps and aerial photos using ArcGIS 9.2. Developed mapping products which included geologic and soils data, as well as a written report, to aid client's knowledge of potential levee instability locations.

DWR Geomorphic Study, Urban Non-Project, Stockton, 2008 – Present. Hydrologist. Ms. Cancienne reviewed and digitized historic topographic maps and aerial photos using ArcGIS 9.2. Developed mapping products which included geologic and soils data, as well as a written report, to aid client's knowledge of potential levee instability locations.

Whidbey Island NAS Mitigation and Stormwater Planning, Whidbey Island, WA, 2008. Hydrologist. PWA is developing a Stormwater Management Plan for a

proposed airfield expansion at the Whidbey Island Naval Air Station at Whidbey Island in Puget Sound, Washington. The project involves hydromodification modeling to assess the potential impact to receiving waters as a result of potential runoff impacts due to an increase in impervious area. The Stormwater Management Plan also involves field data collection of flows and channel bathymetry, hydrologic and hydraulic modeling, and development of alternatives for mitigating potential hydromodification, including Best Management Practices (BMPs). Ms. Cancienne performed HEC-RAS analysis for re-designed channel through mitigation site.

Relevant Experience

Graduate Research Assistant, Oklahoma State University, Stillwater, OK. 2007
Under advisor, Dr. Garey A. Fox, Ms. Cancienne directed and performed experimental analyses involving streambank stability; simulated stability of streambanks using the USDA-ARS Bank Stability and Toe Erosion (BSTEM) model; and reviewed and wrote detailed reports and manuscripts regarding research procedures and findings. Graduate Thesis: *Influence of Seepage Undercutting on the Root Reinforcement of Streambanks*

Graduate Teaching Assistant, Oklahoma State University, Stillwater, OK. 2007
Under advisor, Dr. Glenn Brown, Ms. Cancienne led a discussion section of 25 students for ENSC 3233: Fluid Mechanics.

NSF-REU Life Science/Engineering Program Intern, Texas A&M University, College Station, TX. 2006 Gained undergraduate research experience in the development of dissolved oxygen sensors for fluctuating aquatic environments.

Drilling-Completion Operations Intern, Cimarex Energy Co., Tulsa, OK. 2005
Compiled and assessed patterns associated with drilling processes and expenditures from expired drilling reports.

Publications

Cancienne, R., G.A. Fox, and A. Simon. 2008. Influence of seepage undercutting on the root reinforcement of streambanks. *Earth Surface Processes and Landforms* (In Press).

Cancienne, R., G.A. Fox, and G.V. Wilson. 2008. Vegetated Soil Block Experiments Investigating Three-Dimensional Seepage Erosion Phenomena. Proceedings of the American Society of Agricultural and Biological Engineers Annual Conference, June 29-July 2, 2008.

DECLARATION OF
Marie McLean

I**,** Marie McLean, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Siting, Transmission, and Environmental Protection Division as an Environmental Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on Visual Resources and Traffic and Transportation for the Staff Assessment for the Almond II Peaking Power Plant Project (09-AFC-2)) based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: Original Signature in Dockets

At: Sacramento, California

MARIE McLEAN

QUALIFICATIONS SUMMARY

Twenty years experience in the field of environmental research, analysis, and planning, with specific emphasis on the economics of water, energy, and land use and its social, visual, and cultural ramifications. Specific projects involved (1) assessing economic costs and benefits of water delivery contracts and energy sales; (2) conducting and presenting visual analyses of historic and other local, state, and federal resources; (3) preparing local, state, and federal resource assessment forms; (4) determining and communicating benefits and costs of proposed development projects (housing, energy, and water) on the social and economic life of communities in which they are located; and (5) as member of local design review, historic preservation, and housing boards, recommended programs and policies and monitored their implementation.

RECENT PROFESSIONAL EXPERIENCE

California Energy Commission, Planner II, Environmental Office-Facilities Siting, January 2008—present.

Conduct technical analyses for complex facility siting cases and planning studies in the area of socioeconomics and visual resources.

Electricity Oversight Board; June 1, 2007—December 31, 2008.

Developed, conducted, and presented economic studies on energy markets and transmission projects; California Independent System Operator (CAISO) market redesign and technology upgrade program; and investigated, analyzed, and reported the effects of existing and proposed energy programs on supply, demand, and rates.

California Department of Water Resources, State Water Project Analysis Office, June 2001—July 31, 2007.

Developed and implemented complex analyses of the social, economic, and financial ramifications of contracted and proposed water deliveries and transfers and changes to valuation methods for selling energy in deregulated markets. Researched, identified, and reported on market activities in energy and water and their economic effects on ratepayers.

EDUCATION

Bachelor of Arts, Economics, California State University, Sacramento, 1983

DECLARATION OF
Dr. Obed Odoemelam

I**, Obed Odoemelam** declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Energy Facilities Siting Division as Staff Toxicologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared staff testimony on Transmission Line Safety and Nuisance for the Almond 2 Power Power Plant project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed herein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently hereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/19/10 Signed: Original Signature in Dockets

At: Sacramento, California

RESUME

DR. OBED ODOEMELAM

EDUCATION:

1979-1981 University of California, Davis, California. Ph.D., Ecotoxicology

1976-1978 University of Wisconsin, Eau Claire, Wisconsin. M.S., Biology.

1972-1976 University of Wisconsin, Eau Claire, Wisconsin. B.S., Biology

EXPERIENCE:

1989
The Present: California Energy Commission. Staff Toxicologist.

Responsible for the technical oversight of staffs from all Divisions in the Commission as well as outside consultants or University researchers who manage or conduct multi-disciplinary research in support of Commission programs. Research is in the following program areas: Energy conservation-related indoor pollution, power plant-related outdoor pollution, power plant-related waste management, alternative fuels-related health effects, waste water treatment, and the health effects of electromagnetic fields. Serve as scientific adviser to Commissioners and Commission staff on issues related to energy conservation. Serve on statewide advisory panels on issues related to multiple chemical sensitivity, ventilation standards, electromagnetic field regulation, health risk assessment, and outdoor pollution control technology. Testify as an expert witness at Commission hearings and before the California legislature on health issues related to energy development and conservation. Review research proposals and findings for policy implications, interact with federal and state agencies and industry on the establishment of exposure limits for environmental pollutants, and prepare reports for publication.

1985-1989 California Energy Commission.

Responsible for assessing the potential impacts of criteria and noncriteria pollutants and hazardous wastes associated with the construction, operation and decommissioning of specific power plant projects. Testified before the Commission in the power plant certification process, and interacted with federal and state agencies on the establishment of environmental limits for air and water pollutants.

1983-1985 California Department of Food and Agriculture.

Environmental Health Specialist.

Evaluated pesticide registration data regarding the health and environmental effects of agricultural chemicals. Prepared reports for public information in connection with the eradication of specific agricultural pests in California.

DECLARATION OF
Ellen Townsend-Hough

I, **Ellen Townsend-Hough** declare as follows:

1. I am presently employed by the California Energy Commission in the Engineering Office of the Siting Transmission& Environmental Protection Division as an Associate Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Waste Management for the Turlock Irrigation District (TID) Almond 2 Power Plant based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated:_____ Signed: Original Signature in Dockets

At: Sacramento, California

Ellen Townsend-Hough

SUMMARY

I am a chemical engineer with 27 years of experience. My professional career has afforded me many unique growth and development opportunities. I have a working knowledge of the California Environmental Quality Act. My strengths are in analyzing and performing complex environmental engineering analyses, in areas such as Waste Management, Hazardous Materials Management, Worker Safety, and Water Resources. I worked as a policy advisor to a California Energy Commissioner for three years. I am also an US Environmental Protection Agency Environmental Justice trainer.

PROFESSIONAL EXPERIENCE

Writing

- Write letters, memos, negative declarations, environmental impact reports that require technical evaluation of mechanical engineering and environmental aspects of pollution control systems, environmental impacts, public health issues and worker safety.

Technical Analysis and Presentation

- Performs mechanical engineering analysis of designs for complex mechanical engineering analysis of designs for systems such as combustion chambers and steam boilers, turbine generators, heat transfer systems, air quality abatement systems, cooling water tower systems, pumps and control systems

- Review and process compliance submittals in accordance with the California Environmental Quality Act, the Warren Alquist Act, the Federal Clean Air Act and the California and Federal Occupational Health and Safety Acts to assure compliance of projects

- Provides licensing recommendations and function as an expert witness in regulatory hearings.

- Provide public health impact analysis to assess the potential for impacts associated with project related air toxic/non-criteria pollutant emissions.

- Evaluate the potential of public exposure to pollutant emissions during routine operation and during incidents due to accidents or control equipment failure

- Provide an engineering analysis examining the likelihood of compliance with the design criteria for power plants and also examine site specific potential significant adverse environmental impacts

Technical Skills

- Establish mitigation that reduces the potential for human exposure to levels which would not result in significant health impact or health risk in any segment of the exposed population.

- Assist with on-site audits and inspection to assure compliance with Commission decisions.

- Review and evaluate the pollution control technology applied to thermal power plants and other industrial energy conversion technologies.

- Work with the following software applications: WORD, Excel, and PowerPoint.

Policy Advisor

- Provided policy, administrative and technical advice to the Commissioner Robert Pernell. My work with the Commissioner focused on the policy and environmental issues related to the Commission's power plant licensing, research and development and export programs.

- Track and provide research on varied California Energy Commission (CEC) programs. Prepare analysis of economic, environmental and public health impacts of programs, proposals and other Commission business items.

- Represent Commissioner's position in policy arenas and power plant siting discussions.

- Write and review comments articulating commission positions before other regulatory bodies including Air Resources Board, California Public Utilities Commission, and the Coastal Commission.

- Wrote speeches for the Commissioner's presentations.

EDUCATION

Bachelor of Science, Chemical Engineering
Drexel University, Philadelphia Pennsylvania

Continuing Education
Hazardous Material Management Certificate, University California Davis
Urban Redevelopment and Environmental Law, University of California Berkley
Analytical Skills, California Department of Personnel Administration (DPA) Training Center
Legislative Process/Bill Analysis, DPA Training Center
Federally Certified Environmental Justice Trainer

References furnished upon request.

DECLARATION OF

Testimony of Dal Hunter, Ph.D., C.E.G.

I, **Dal Hunter, Ph.D., C.E.G.,** declare as follows:

1. I am presently employed as a subcontractor to Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as an Engineering Geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **GEOLOGY AND PALEONTOLOGY** for the **Turlock Irrigation District Almond 2 Power Plant Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 6, 2010 Signed: _____

At: Black Eagle Consulting, Inc.
Reno, Nevada

REGISTERED GEOLOGIST
ROBERT DALTON HUNTER
No. 1411
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Exp 3.31.11

Robert D. Hunter, Ph.D., C.E.G.
Engineering Geologist
Vice President

Education

- Ph.D. – Geology – 1989 – University of Nevada, Reno
- M.S. – Geology – 1976 – University of California - Riverside
- B.S. – Earth Science – 1972 – California State University, Fullerton

Registrations

- Professional Geological Engineer – Nevada
- Registered Geologist – California
- Certified Engineering Geologist – California

Experience

1997 to Present: Black Eagle Consulting, Inc.; Vice President. Dr. Hunter is in charge of all phases of geochemical, geological, and geotechnical projects and is responsible for conducting, coordinating, and supervising geotechnical investigations for public and private sector clients. He is very familiar with design specifications and state and federal requirements.

Dr. Hunter has also provided geological, geotechnical, and paleontological review and written and oral testimony for California Energy Commission (CEC) power plant projects including:

- El Segundo Power Redevelopment Project (Coastal, including testimony and compliance monitoring)
- Magnolia Power Project (including compliance monitoring
- Ocotillo Energy Project (Wind Turbines)
- Vernon-Malburg Generating Station
- Inland Empire Energy Center (including testimony and compliance monitoring)
- Palomar Energy Project
- Henrietta Peaker Project
- East Altamont Energy Center
- Avenal Energy Center
- Teayawa Energy Center monitoring
- Walnut Energy Center (including compliance monitoring
- Riverside Energy Resource Center
- Salton Sea Unit 6 (Geothermal Turbines)
- National Modoc Power Plant
- Pastoria Energy Center
- Sun Valley Energy Project
- El Centro Unit 3 Repower Project
- AES Highgrove Project
- South Bay Replacement Project
- Vernon Power Plant

- Humboldt Bay Repowering Project
- Victorville Power Project
- Carlsbad Energy Center
- San Gabriel Generating Station
- Orange Grove
- Chula Vista Energy Upgrade
- Carrizo (Solar)
- Kings River
- Canyon Power Plant
- Otay Mesa Generating Project (compliance monitoring)
- Montainview Power Plant Project (compliance monitoring)
- Consumes Power Plant (compliance monitoring)
- Sunrise Power Project (compliance monitoring)
- Niland Power Project (compliance monitoring)
- Panoche Power Plant (compliance monitoring)

Attended Expert Witness Training Sponsored by CEC.

1978 to 1997: SEA, Incorporated; Geotechnical Manager, Engineering Geologist. Dr. Hunter was in charge of all phases of geotechnical projects for SEA, including project coordination and supervision, field exploration, geotechnical analysis, slope stability analysis, soil mechanics, engineering geochemistry, mineral and aggregate evaluations, and report preparation. Numerous investigations were undertaken on military, commercial, industrial, airport, residential, and roadway projects. He worked on many geothermal power plants, providing expertise in foundations design, slope stability, seismic assessment, geothermal hazard evaluation, expansive clay, and settlement problems. Project types included high-rise structures, airports, warehouses, shopping centers, apartments, subdivisions, storage tanks, roadways, mineral and aggregate evaluations, slope stability analyses, and fault studies.

1977 to 1978: Fugro (Ertec) Incorporated Consulting Engineers and Geologists; Staff Engineering Geologist; Long Beach, California.

Affiliations

- Association of Engineering Geologists

Publications

- Hunter, 1988, *Lime Induced Heave in Sulfate Bearing Clay Soils*, Journal of Geotechnical Engineering, ASCE, Vol. 14, No. 2, pp. 150-167.

- Hunter, 1989, *Applications of Stable Isotope Geochemistry in Engineering Geology*: Proceedings of the 25th Annual Symposium on Engineering Geology and Geotechnical Engineering.

- Hunter, 1993, *Evaluation of Potential Settlement Problems Related to Salt Dissolution in Foundation Soils*: Proceedings of the 29th Annual Symposium on Engineering Geology and Geotechnical Engineering.

DECLARATION OF
SHAHAB KHOSHMASHRAB

I**, SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Facilities Siting Division as a **MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I participated in the preparation of the staff testimony on **Power Plant Efficiency** for the **TID Almond 2 Power Plant** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: Original Signature in Dockets

At: Sacramento, California

DECLARATION OF
SHAHAB KHOSHMASHRAB

I**, SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Facilities Siting Division as a **MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I participated in the preparation of the staff testimony on **Power Plant Reliability** for the **TID Almond 2 Power Plant** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: Original Signature in Dockets

At: Sacramento, California

Shahab Khoshmashrab
Mechanical Engineer

Experience Summary

Nine years experience in the Mechanical, Civil, Structural, and Manufacturing Engineering fields involving engineering and manufacturing of various mechanical components and building structures. This experience includes QA/QC, construction/licensing of electric generating power plants, analysis of noise pollution, and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Sacramento-- Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California

Professional Experience

2001-2004--Mechanical Engineer, Systems Assessment and Facilities Siting– California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise and vibration, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

1998-2001--Structural Engineer – Rankin & Rankin

Engineered concrete foundations, structural steel and sheet metal of various building structures including energy related structures such as fuel islands. Performed energy analysis/calculations of such structures and produced structural engineering detail drawings.

1995-1998--Manufacturing Engineer – Carpenter Advanced Technologies

Managed manufacturing projects of various mechanical components used in high tech medical and engineering equipment. Directed fabrication and inspection of first articles. Wrote and implemented QA/QC procedures and occupational safety procedures. Conducted developmental research of the most advanced manufacturing machines and processes including writing of formal reports. Developed project cost analysis. Developed/improved manufacturing processes.

DECLARATION OF
LAIPING NG

I, Laiping Ng declare as follows:

1. I am presently employed by the California Energy Commission in the Engineering Office of the Siting, Transmission & Environmental Protection Division as an Associate Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Transmission System Engineering, for the TID Almond 2 Power Plant based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: Original Signature in Dockets

At: Sacramento, California

Laiping Ng
Associate Electrical Engineer

Education:

Master of Science: Electrical Engineering - Power
California State University, Sacramento. December 1997.

Bachelor of Science: Electrical Engineering - Power
California State University, Sacramento. May 1991.

Power Certificate – EPRI, May 1991

Experience:

April 1999 – Present:

- Review and evaluate electrical transmission system sections of the application to ensure that the transmission engineering aspects of the power plant, switchyards, substations, and the related facilities comply with applicable laws, ordinances, regulations, and standards (LORS).

- Prepare written analysis, which address the issues of the adequacy of proposed projects to meet applicable LORS.

- Perform load flow studies and fault analysis.

- Coordinate with CAISO, WSCC and other regulatory agencies and coordinate with utilities companies in the review and evaluation of the power plant siting process.

May 1991 – April 1999:

- Prepared engineering bid specifications for recommended lighting and HVAC projects. Evaluated contractor bids and recommended contractors to customers. Reviewed RFPs and RFQs. Evaluated, selected, and managed engineering consultants. Administrated and coordinated contracts.

- Designed electrical systems for indoor and outdoor lighting and lighting controls. Assisted in design cooling systems and controls for school buildings and office buildings. Reviewed and checked electrical lighting designs and drawings. Analyzed designs and made recommendations for effective actions.

- Performed facility energy audits and field surveys on schools, offices, hospitals and county jail facilities to identify energy efficiency improvements and cost estimate with respect to lighting and HVAC systems. Inspected lighting and HVAC system equipment installation.

- Worked with regulatory agencies to conduct day-to-day basis works such as participated in Nonresidential Energy Efficiency Standards development teams. Prepared and updated Standards concentrating on interior building illumination and indoor and outdoor flood lighting.

DECLARATION OF
Mark Hesters

I, Mark Hesters, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as a Senior Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the **Transmission System Engineering** for the **Almond 2 Power Plant** (09-AFC-2) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated:_____ Signed: Original Signature in Dockets

At: Sacramento, California

Mark Hesters

916-654-5049
mark.hesters@energy.state.ca.us

Qualifications

- Analyzed the reliability impacts of electric power plants for nine years.
- As an expert witness, produced written and oral testimony in numerous California Energy Commission proceedings on power plant licensing.
- Expertise in power flow models (GE PSLF and PowerWorld), production cost models (GE MAPS), Microsoft word-processing, spreadsheet and database programs.
- Contributing author to many California Energy Commission reports.
- Represented the Energy Commission in the development of electric reliability and planning standards for California.

Experience

Senior Electrical Engineer

2005-Present California Energy Commission, Sacramento, CA

- Program manager of the transmission system engineering analysis for new generator Applications of Certification.
- Lead the development of transmission data collection regulations.
- Overhauled the transmission data adequacy regulations for the Energy Commission's power plant certification process.
- Participated in the analysis of regional transmission projects.
- Technical lead for Commission in regional planning groups.
- Energy Commission representative to the Western Electric Coordinating Council Operations Committee.

Associate Electrical Engineer

1998–2005 California Energy Commission, Sacramento, CA

- Lead transmission systems analyst for power plant licensing under 12-month, 6-month and 21-day licensing processes.
- Provided expert witness testimony on the potential transmission impacts of new power plants in California Energy Commission licensing hearings.
- Authored chapters for California Energy Commission staff reports on regional transmission issues.
- Studied the economics of transmission projects using electricity production simulation tools.
- Analyzed transmission systems using the GE PSLF and PowerWorld load flow models.
- Collected and evaluated transmission data for California and the Western United States

Electric Generation Systems Specialist

1990–1998 California Energy Commission, Sacramento, CA

- Lead generation planner for southern California utilities.
- Analyzed electric generation systems using complex simulation tools.
- Provided analysis on the impact of resource plans on air quality and electricity costs for California Energy Commission reports.
- Developed modeling characteristics for emerging technologies.
- Evaluated resource plans.

Education

1985–1989 University of California at Davis Davis, CA

- B.S., Environmental Policy Analysis and Planning

DECLARATION OF
Suzanne L. Phinney, D.Env.

I**,** Suzanne L. Phinney**,** declare as follows:

1. I am presently employed by Aspen Environmental Group, consultant to the California Energy Commission's Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a Senior Associate.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Alternatives for the Almond Two Power Plant Licensing Case Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: February 2, 2010 Signed: Original Signature in Dockets

At: Sacramento, California

SUZANNE L. PHINNEY

Senior Associate, Energy and Infrastructure

ACADEMIC BACKGROUND

Doctorate, Environmental Science & Engineering (D.Env.), University of California, Los Angeles, 1981
M.S., Marine Biology, Dalhousie University, Halifax, Nova Scotia, Canada, 1975
B.A., Biological Sciences, University of California, Berkeley, 1973

PROFESSIONAL EXPERIENCE

Dr. Phinney has 30 years of experience in the environmental and energy field, providing technical and policy support in energy analysis, environmental assessment, environmental remediation, air and water quality assessments, risk assessment, regulatory compliance, permitting, and project/program management. Her particular emphasis is energy and infrastructure with projects addressing climate change, alternative energy generation technologies, liquefied natural gas, petroleum infrastructure, advanced transportation vehicles and fuels, land use and energy, and power plant siting. Prior to employment at Aspen, Dr. Phinney worked for 16 years with Aerojet, where she oversaw all environmental and safety issues.

Aspen Environmental Group — 2001 to present

Dr. Phinney manages energy and infrastructure projects for Aspen and provides environmental support on major projects. She has provided energy and environmental expertise to the following clients:

California Energy Commission (CEC). Dr. Phinney has supported CEC staff since 2001. She has prepared analyses for several power plants throughout the State, and has authored or contributed to over a dozen special studies. She is currently Deputy Program Manager for planning studies conducted by the Aspen team. Her major efforts for the CEC include the following.

- **Power Plant Siting, CEC, Project Management/Technical Support (2001 – Present).** Dr. Phinney prepared the alternatives analysis for the following power plants under review by the Energy Commission:
  - **Palomar Energy Project –** 500 MW combined-cycle natural gas facility in Escondido, San Diego County
  - **Russell City Energy Center –** 600 MW combined-cycle natural gas facility in Hayward, Alameda County
  - **Eastshore Energy Center -** 115.5 MW simple-cycle natural gas facility in Hayward, Alameda County
  - **Carrizo Energy Solar Farm –** 177 MW solar thermal (Compact Linear Fresnel Reflector) plant in the Carrizo Plain, San Luis Obispo County
  - **CPV Sentinel Energy Project –** 850 MW natural gas plant in the Coachella Valley, Riverside County
  - **Marsh Landing Generating Station-** 930 MW natural gas plant within the existing Contra Costa Power Plant in Antioch, Contra Costa County
  - **Orange Grove Project –** 96 MW natural-gas peaking facility near Pala, San Diego County
  - **Willow Pass Generating Station –** 550 MW natural gas plant within the existing Pittsburg Power Plant in Pittsburg, Contra Costa County

- **Almond 2 Peaking Power Plant Project** – 174 MW natural-gas peaking facility near Ceres, Stanislaus County
- **Abengoa Mojave Solar Project** – 250 MW solar thermal (parabolic trough) plant near Harper Dry Lake, San Bernardino County
- **Ridgecrest Solar Power Project** – 250 MW solar thermal (parabolic trough) plant on 3,920 acres of BLM land near Ridgecrest, Kern County

Dr. Phinney prepared the waste management assessments of power plant licensing applications:

- **Eastshore Energy Center –** 115.5 MW natural gas simple-cycle plant in Hayward, Alameda County
- **Carrizo Energy Solar Farm –** 177 MW solar thermal (Compact Linear Fresnel Reflector) plant in the Carrizo Plain, San Luis Obispo County
- **Palmdale Hybrid Power Project –** 570 MW natural gas-solar thermal (parabolic trough) hybrid plant in Palmdale, Los Angeles County
- **SES Solar Two Siting Case –** 750 MW solar thermal (Stirling dish) plant on 6,500 acres of mostly BLM land in Imperial County
- **Hanford Energy Park Peaker Plant –** 120 MW simple-cycle, natural gas facility in Hanford, Kings County
- **Ridgecrest Solar Power Project** – 250 MW solar thermal (parabolic trough) plant on 3,920 acres of BLM land near Ridgecrest, Kern County
- **Blythe Solar Power Project** – 1,000 MW solar thermal (parabolic trough) plant on 9,400 acres of BLM land near Blythe, Riverside County
- **Palen Solar Power Project** – 500 MW solar thermal (parabolic trough) plant on 5,200 acres of BLM land in the Chuckwalla Valley, Riverside County

Dr. Phinney also coordinated the study of cooling water alternatives for the Tesla and Tracy natural gas, combined-cycle power plants.

- **Environmental Performance Report, CEC, Project Manager/Technical Support (2001, 2003, 2005)**.Dr. Phinney was Project Manager for Aspen's technical contributions, graphics and production efforts for the 2001 Environmental Performance Report (EPR) which detailed the current and historical air, water and biological impacts from in-state generation facilities. She provided support to the water resources discussion in the 2003 EPR and managed the analysis of out-of-state generation facilities for the 2005 EPR.
- **Advanced Electric Generation Technologies, CEC, Project Manager (2001 - 2002).** Dr. Phinney served as Project Manager for a report defining the technical development, developmental capacity, commercial status, costs and deployment constraints of selected alternative electric generation technologies. Technologies included geothermal, fuel cell, solar thermal, solar photovoltaic, wind and hydro. The focus was on development and application of the technology in California. Two page fact sheets on each technology and a matrix comparing all technologies was developed. Finally, an updated discussion of renewable technologies was developed for insertion into the alternatives section of Staff Assessments for power plant applications.
- **Liquefied Natural Gas Support, CEC, Technical Author (2002 – 2007**). Dr. Phinney has been instrumental in the preparation of numerous safety and policy reports on liquefied natural gas (LNG). She authored the Commission document: *International and National Efforts to Address the Safety and Security of Importing Liquefied Natural Gas: A Compendium*. This report reviewed national and international LNG regulations, standards and guidelines, reviewed risk assessment techniques, and identified, compiled and reviewed LNG safety/risk studies. Dr. Phinney helped organize LNG Access Workshops held in June 2005 and prepared a 40 page summary of presentations made at the workshops. She developed over 30 fact sheets on LNG subject areas for distribution to the public. Dr. Phinney compiled state and local comments on a proposed LNG terminal at the Port of Long Beach;

these were presented in the *Safety Advisory Report on the Proposed Sound Energy Solutions Natural Gas Terminal at the Port of Long Beach, California,* which was delivered to the Federal Energy Regulatory Commission within the mandated 30-day period imposed by the 2005 federal Energy Bill. She provided technical review for the report *The Outlook for Global Trade in Liquefied Natural Projections to the year 2020.*

- **Natural Gas Market Assessment Support, CEC, Technical Author/Editorial Support (2005 –** 2007). Dr. Phinne**y c**ontributed to natural gas supply and demand analyses for the Commission document, *Natural Gas Assessment Update*. She provided technical and editorial support to the 2005 and 2007 Integrated Energy Policy Report (IEPR) documents, *Preliminary (and subsequently the Revised report) Reference Case in Support of the 2005 Natural Gas Market Assessment* and *2007 Natural Gas Market Assessment.* She edited the Commission document *Natural Gas Quality: Power Turbine Performance During Heat Content Surges.*
- **Petroleum Infrastructure Environmental Performance Report, CEC, Project Manager (2005)**. Dr. Phinney served as Project Manager for the 2005 IEPR document *Petroleum Infrastructure Environmental Performance Report.* In addition to managing preparation of the report and workshop presentations, she prepared responses to comments and provided policy recommendations.
- **Hydropower and Global Climate Change, CEC, Technical Author (2005)**. Dr. Phinney coauthored the document *Potential Changes in Hydropower Production from Global Climate Change in California and the Western United States*. This report investigated the effects of climate change on hydropower production in the West and compared impacts and policy actions in California, the Pacific Northwest, and the Southwest.
- **Advanced Energy Pathways, CEC, Project Manager (2006 – 2008).** Dr. Phinney provided project management support for a 3-year study evaluating the effects of advanced transportation technologies and fuels (out to 2050) on California's natural gas and electricity systems. This report involved the development of baseline and alternative energy demand and supply scenarios, in-depth technical analysis of advanced transportation technologies and fuels, and the development of an energy-rich model.
- **Land Use and Energy, CEC, Project Manager/Technical Author (2006 – 2008).** Dr. Phinney authored a CEC report on the linkages between land use and energy, which ultimately became one of the two chapters presented in the 2006 IEPR Update. The report highlighted how energy can be better integrated in land use planning, and how efforts such as smart growth can help the state meet its energy and greenhouse gas emission reduction goals. She organized a full-day workshop involving over a dozen speakers representing state agencies, local governments, research entities, environmental groups, utilities, and non-profits. Dr. Phinney was one of the authors of the 2007 land use and energy follow-up report which further defined the role of land use in meeting California's energy and climate change goals. She helped synthesize the report into a chapter for the 2007 IEPR. Dr. Phinney helped edit the Land Use Subgroup of the Climate Action Team report prepared for submission to the California Air Resources Board AB 32 Scoping Plan.
- **AB 1632 Nuclear Power Plant Assessment, CEC, Technical Author (2007 – 2008).** Dr. Phinney was a key member of a team evaluating nuclear power issues in the state in response to AB 1632 legislation. She managed and prepared report sections regarding the impacts to local communities and the environmental issues and costs associated with alternatives, including renewables, to the state's two nuclear facilities. These sections were incorporated in the report *An Assessment of California's Nuclear Power Plants.*
- **Environmental Screening Tool for Out-of-State Renewable Energy Facilities, CEC, Project Manager (2009).** Dr. Phinney prepared an environmental screening tool/analysis allowing CEC to determine quickly whether out-of-state renewable facilities requesting RPS certification met California laws, ordinances, regulations and standards.

- **Energy Aware Facility Planning and Siting Guide, CEC, Project Manager (2009-2010).** Dr. Phinney is updating a 1997 version of the Energy Aware Guide to help local governments plan for and permit electricity generation facilities and transmission lines that will be needed in the upcoming years. The Guide informs planners, decision makers and the public about what, how, and why electricity infrastructure may be developed.

California Public Utilities Commission. Dr. Phinney has managed several environmental assessments for the CPUC and has been heavily involved in editorial support of many other CPUC documents prepared by Aspen.

- **Looking Glass Network Initial Study/Mitigated Negative Declaration, CPUC, Project Manager (2002 – 2003).** Dr. Phinney served as Project Manager for the preparation of Initial Study/Mitigated Negative Declarations (IS/MND) for this telecommunication project that involved construction in the San Francisco Bay Area and the Los Angeles Basin to allow fiber optic connections in numerous locations.
- **Williams Communications Sentry Marysville Project IS/MND, CPUC, Project Manager (2002 – 2003).** Dr. Phinney served as Project Manager for the installation of fiber optic connection to a Beale Air Force Base in Yuba County.
- **Kirby Hills II Natural Gas Storage Facility IS/MND, CPUC, Project Manager (2007).** Dr. Phinney managed an IS/MND for expansions at a natural gas storage facility in Solano County.
- **Multiple EIR Documents, CPUC, Technical Editor (2004 - 2008).** Dr. Phinney provided editorial and QA/QC review for the Diablo Canyon Steam Generator Replacement EIR, the Miguel Mission 230 kV Transmission Line EIR and the Sunrise Powerlink EIR/EIS.

California Institute of Technology/University of California. Dr. Phinney provided project management support to the following project.

- **Combined Array for Research in Millimeter-wave Astronomy EIS/EIR**, **U.S. Forest Service and the University of California (2001 – 2002).** Dr. Phinney was the Project Manager for this EIS/EIR for a radio telescope antenna array to be placed at a high altitude site in the Inyo National Forest. The evaluation of alternatives was especially contentious, and Aspen's field analyses of several potential sites were pivotal in the ultimate selection of one of these alternative sites.

Western Area Power Administration. Dr. Phinney provided editorial and QA/QC support to the following projects.

- **North Area ROW Maintenance Project Environmental Assessment, Western, Technical Editor/QA/QC (2006-2008).** Dr. Phinney provided technical editing and QA/QC support for all documents relating to the development of 800 miles of transmission lines in Northern California.
- **Sacramento Area Voltage Support Supplemental EIS/EA, Technical Editor/QA/QC (2006 – 2008).** Dr. Phinney provided technical editing and QA/QC support for all environmental documentation and permitting for new construction and reconstruction of transmission lines in the greater Sacramento area.

Vermont Yankee Nuclear Power Plant Report, Vermont Department of Public Service, Project Manager (December 2008 to January 2009). Dr. Phinney was the Project Manager and provided technical support for the environmental analysis of the continued operation of the Vermont Yankee Nuclear Power Station in Vernon, Vermont. The report assessed the environmental impacts to land, water and air resources (including climate change), soil and seismicity, on-site and off-site storage and disposal of high-level and low-level nuclear waste.

GenCorp 1999 to 2000

- As Vice President, Environmental and Regulatory Affairs, Dr. Phinney held primary responsibility for coordinating the company's aerospace and automotive environmental activities with various federal, State, and local regulatory agencies. Her specific responsibilities included: working with external groups and entities to develop responsible environmental legislation, regulations, and standards and the implementation of sound public policy; developing stakeholder base and strategy to ensure that company objectives were achieved; facilitating company and regulatory agency discussions to achieve more comprehensive and quicker remediation of sites; and spearheading a stakeholder group to develop and fund scientific studies on selected chemicals of concern.

Aerojet General Corporation 1984 to 1999

As Vice President, Environmental Health and Safety, Dr. Phinney ensured that programs were in place to meet all regulatory requirements and company initiatives. Her responsibilities included: providing strategic direction and management of all superfund-related investigation and remediation activities; developing environmental management plans; communicating environmental requirements, concerns, and successes to both internal and external audiences, including the board of directors, investment banking, and the analyst community; and participating as a member of the leadership council in defining company-wide business objectives and targets.

- Dr. Phinney created the first corporate EHS department, defining and staffing key functional areas. She managed a $20,000,000 annual budget and oversaw a staff of up to 30 professionals. Select accomplishments include: the development of remediation technologies that resulted in the cleanup of over 50 billion gallons of contaminated groundwater; development of the world's first groundwater treatment facility for perchlorate; significant reductions in emissions and hazardous waste generation; representation on numerous legislative and regulatory task forces and leadership positions on external business and community EHS committees and councils; and extensive public outreach efforts.

PREVIOUS EXPERIENCE, 1976 TO 1984

Jacobs Engineering Group. Dr. Phinney conducted toxicological, ecological, and air and water quality assessments.

Department of Environmental Science and Engineering at the University of California, **Los Angeles.** Dr. Phinney analyzed legal, economic, public health, and administrative barriers to waste water reuse. She also conducted an analysis of ecological and institutional factors in coastal siting of power plants.

Southwest Los Angeles Junior College. Dr. Phinney taught lecture and laboratory courses in general science.

TRAINING

- Certificate, Executive Program, University of California, Davis, 1989
- Expert Witness Training, California Energy Commission, 2001

HONORS AND AWARDS

- Who's Who of American Women, 18th Edition
- YWCA Outstanding Woman of the Year (Sciences) Award, 1992
- Woman of Achievement Award, Downtown Capitol Business and Professional Women, 1993
- Individual Award for Outstanding Contribution in Air Quality, 1995
- Sacramento Safety Center Incorporated, Eagle Award for Safety, 1998
- Regional Award for Outstanding Contribution in Air Quality, 2003

ACTIVITIES AND ASSOCIATIONS

- Editorial Board, The Environmental Professional, 1987-1989
- City of Sacramento Toxic Substances Commission, 1986-1988
- Sacramento Environmental Commission, 1988-1991
- Board of Directors, League of Women Voters of Sacramento, 1989-1999; President 1996-1997; Co-President 1997-1998; 2003-2005; Energy Study Committee 2005; Moderator/Facilitator of Debates and Forums (e.g., climate change, the SACOG's MTP, and flood control)
- Toxics Consultant, League of Women Voters of Sacramento, 1988-1989
- Member, Advisory Committee on AB 3777 (Risk Management Prevention Programs)
- Board of Directors, American Lung Association of Sacramento-Emigrant Trails, 1992-2000; President 1998-1999;
- Board of Directors, Sacramento Metropolitan Chamber of Commerce, 1992-1997; Vice President, Public Policy, 1996-1997
- Board of Directors, Air and Waste Management Association, 1991-1994
- Steering Committee Chair, Cleaner Air Partnership, 1993-1996, 2000-2001; Executive Committee 1993 to present
- Co-chair, TCE Issues Group, 1994-2000
- Sacramento Water Forum, 1995-2000
- Rate Advisory Committee, Sacramento Municipal Utility District, 1999-2001

SELECTED PUBLICATIONS/PRESENTATIONS

Phinney, S.L., Panel Moderator, Climate Change Initiatives for California, AEP Annual Conference, Shell Beach, California, 2007.

Phinney, S.L., Panel Moderator, Is there a Need for LNG in California, AEP Annual Conference, Shell beach, California, 2007.

Phinney, S.L., "LNG Safety Analysis in California – Federal, State and Local Processes" Presented at California Foundation on the Environment and the Economy, 2005.

Phinney, S.L., "Energy Basics" Presented at League of Women Voters of California Annual Convention, 2005.

Phinney, S.L., Presentation to U.S. Department of Justice, Office of the U.S. Attorney, on Women and Equality, 2004.

Phinney, S.L., "Trends in Industrial Waste Generation and Management" Presented at National Ground Water Association Conference, Las Vegas, Nevada, 1996.

Phinney, S.L., "Effective Management of an RI/FS to Reduce Financial Exposure," Manufacturers Alliance Environmental Management Council, Washington, D.C., 1995.

Phinney, S.L., "Knowing Your Compliance Challenge," 7th Annual California Statewide Community Awareness and Emergency Response (CAER) Conference, Sacramento, California, 1995.

Phinney, S.L., "Industry's Role in Broadening the Use of Alternative Fuels in America," Clean Cities Ceremony, Sacramento, California, 1994.

Phinney, S.L., "Aerospace Industry Perspective on Defense Conversion," AAAS Annual Meeting, San Francisco, California, 1994.

Phinney, S.L., "Aerojet's Waste Reduction Successes," Business for the Environment Conference, Sacramento, California, 1993.

Phinney, S.L., "Company Worker Trip Reduction Programs Under the Clean Air Act Amendments." MAPI Hazardous Materials Management Council, Washington, D.C., 1993.

Phinney, S.L., Testimony Before House Government Operations Subcommittee, 1993.

Phinney, S.L., Moderator, The Clean Air Act, A Public Forum, Sacramento, California, 1993.

Phinney, S.L., Plenary Session Chairperson and Speaker, "Business and the Environment: Must You Sacrifice One for the Other?" National Association of Environmental Professionals Conference, Seattle, Washington, 1992.

Phinney, S.L., "Facing the Challenge: The New California EPA." HazMat Northern California Conference, San Jose, California, 1992.

Phinney, S.L., "Understanding the Client Perspective." Environmental Business Conference, Pasadena, California, 1991.

Phinney, S.L., Panelist – Women of Science: Secrets of Success. Workshop, AAAS Annual Meeting, Washington, D.C., 1991.

Phinney, S.L., Keynote Address, ADPA International Symposium on Compatibility and Processing, San Diego, California, 1991.

Phinney, S.L., Keynote Address, Women in Science and Technology Conference, Jackson, Mississippi, 1991.

Phinney, S.L., Guest Speaker, Sacramento County Bar Association, Environmental Law Section, Sacramento, California, 1991.

Phinney, S.L., "Managing CERCLA Compliance from the Corporate Perspective." Hazardous Materials Management Conference/West, Long Beach, California, 1988.

Phinney, S.L., and C.A. Fegan, "Identifying a Feasible, Effective Treatment Method for an Unusual Chemical of Concern." Proceedings, American Defense Preparedness Association 16th Environmental Symposium, New Orleans, Louisiana, 1988.

Phinney, S.L., "A Proactive Superfund Cleanup by Industry." Proceedings of the 4th Annual Hazardous Materials Management Conference/West, Long Beach, California, 1988.

Thompson, C.H., S.L. Phinney and F.R. McLaren, "Aerojet: A Regional Site Program – Problem Definition." Proceedings of the Hazardous Waste and Environmental Emergencies Conference, Cincinnati, Ohio, 1985.

Kahane S.W., S.L. Phinney and A. Wright, "The Tightening Environmental Regulatory Climate for Hazardous Waste Management – Current Mandates and Future Directions for Industrial Compliance." Proceedings of the 1984 AlChE Summer National Meeting, Philadelphia, Pennsylvania, 1984.

Bachrach, A., D.M. Morycz, S.L. Phinney and S.W. Kahane, "Regulation and Offshore Oil and Gas Facilities." In: Emerging Energy/Environmental Trends and the Engineer. Eds. R.D. Nuefeld and R.W. Goodwins, 1983.

Lindberg, R.G., S.L. Phinney, J. Daniels and J. Hastings (eds)., "Environmental Assessment of the U.S. Department of Energy's Solar Thermal Technology Program." Prepared for the U.S. Department of Energy, June 1982.

Kahane, S.W., S.L. Phinney, J.A. Hill and R.C. Sklarew, "Key Considerations in Assessing the Air Impacts of Projected Outer Continental Shelf Oil and Gas Development," presented at the 74th Annual Air Pollution Control Association Meeting, Philadelphia, Pennsylvania, 1981

Phinney, S.L., "The U.S. Environmental Protection Agency's Pesticide Registration Program: A Case Study – Chloramben." Doctoral Dissertation, Environmental Science and Engineering Program, University of California, Los Angeles, California, 1981.

Phinney, S.L., (contributing author) et al. "Institutional Barriers to Wastewater Reuse in Southern California." Environmental Science and Engineering Report Prepared for the Office of Water Research and Technology, U.S. Department of the Interior, 1979.

Phinney, S.L., "Area-Restricted Feeding in American Plaice." Masters Thesis. Dalhousie University, Halifax, Nova Scotia, Canada, 1975.

DECLARATION OF
Chris Davis

I, Chris Davis, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as a Compliance Project Manager.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the **General Conditions Including Compliance Monitoring and Closure Plan** for the **Almond II Power Plant** project (09-AFC-2) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated:_____ Signed: Original Signature in Dockets

At: Sacramento, California

Chris Davis

California Energy Commission
1516 Ninth St., MS-2000
Sacramento, California 95814
(916) 654-4842

Professional Experience

January 2008 to present

California Energy Commission
Planner III Compliance Project Manager – Oversee power plant construction. Process amendments to Energy Commission project certifications. Direct technical staff in tasks related to compliance issues regarding power plant project design, construction, operation, and associated environmental issues. Work with power plant operators, public agencies, community groups, engineering, legal and technical staff to identify and resolve issues.

2007-2008

California Energy Commission
Energy Specialist I – Education and outreach for the New Solar Homes Partnership (NSHP) and the Building Standards Office. Developed fact sheets on proposed changes to the 2008 building standards and a tutorial on how to use the PV Calculator to figure photovoltaic system power production and expected incentives. Wrote case study, articles and Web pages explaining various aspects of the NSHP program. Certified by CalCERTS (California Energy Rating and Testing Services) as a Home Energy Rating System (HERS) rater for photovoltaic systems. Organized, developed materials and staffed Energy Commission booth/tables for conferences put on by California Building Energy Consultants (CABEC) and others.

2005-2007

State Water Quality Control Board
Information Officer I - Liaison between the media and both the State Water Board and Central Valley Regional Water Board. Issues included waste (NPDES) permits, groundwater contamination and treatment, once-through cooling, emerging contaminants, contaminated beaches, stormwater containment, and areas of special biological significance. Organized, produced and served as master of ceremonies for presentations of grant awards to repair watersheds, practice sustainable forestry and construct water treatment facilities.

2005-2008

California Energy Commission
Information Officer I – Joined the Energy Commission media office during California's power crisis. Liaison between Energy Commission and media in the area of power plant licensing. Wrote

news releases about projects as they reached milestones in the approval and construction process, including a number of releases for Governor's office about new facilities beginning operations. Initiated and developed Power Plant Fact Sheet in cooperation with Siting Office manager.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE TID ALMOND 2 *POWER PLANT PROJECT*

Docket No. 09-AFC-2

PROOF OF SERVICE
(Revised 1/26/10)

APPLICANT
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*indicates change

DECLARATION OF SERVICE

I, Hilarie Anderson, declare that on April 30, 2010, I served and filed copies of the attached, Staff Assessment. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:
[http://www.energy.ca.gov/sitingcases/almond].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(***Check all that Apply***)

FOR SERVICE TO ALL OTHER PARTIES:

___✔___ sent electronically to all email addresses on the Proof of Service list;

___✔___ by personal delivery or by depositing in the United States mail at Sacramento, CA with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

___✔___ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-2
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Original Signature in Dockets
Hilarie Anderson