STAFF REPORT

Staff Assessment

PITTSBURG DISTRICT ENERGY FACILITY

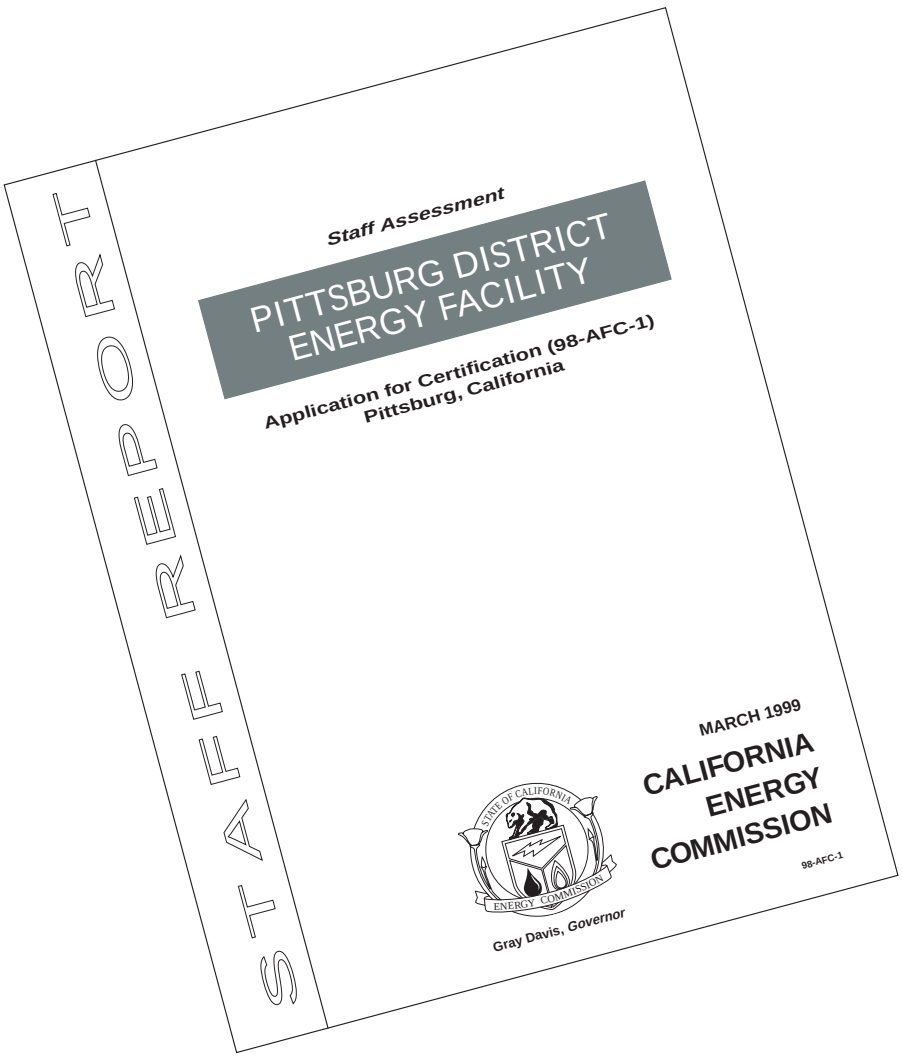
Application for Certification (98-AFC-1)
Pittsburg, California

MARCH 1999

CALIFORNIA ENERGY COMMISSION

Gray Davis, *Governor*

98-AFC-1



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EXECUTIVE SUMMARY

INTRODUCTION

This document, the Staff Assessment (SA), presents the California Energy Commission staff's independent assessment of Pittsburg District Energy Facility, Limited Liability Corporation's (applicant) Application for Certification (AFC) of the Pittsburg District Energy Facility (PDEF). The applicant is proposing to develop, construct and operate a 500 megawatt (MW) natural gas-fired power plant. The proposed location for this plant is on a 12-acre site on East 3rd Street, west of the intersection of East 3rd Street and Columbia in the City of Pittsburg in Eastern Contra Costa County. The project's major linear features will include a new natural gas pipeline; a new pipeline for reclaimed water; a new 115 kilovolt transmission line that will interconnect with Pacific Gas and Electric's existing Pittsburg Power Plant substation; and a truck bypass road. The applicant has proposed the use of tertiary-treated water, supplied by Delta Diablo Wastewater Treatment Facility (DDWTF), for cooling. In addition, the applicant and the City of Pittsburg entered into an Alliance and Development Agreement effective July 2, 1997 to identify, evaluate, and potentially implement various energy-related projects and opportunities.

The PDEF and related facilities such as the electric transmission lines, switchyard and natural gas pipeline are under the Energy Commission's jurisdiction (Pub. Resources Code (PRC) §§ 25500 *et seq*.). When issuing a license, the Energy Commission acts as lead state agency (PRC § 25519(c)) under the California Environmental Quality Act (PRC §§ 21000 *et seq*.), and its process is functionally equivalent to the preparation of an environmental impact report (PRC § 21080.5). Staff's primary responsibility is to provide an assessment of the project's potentially significant effects on the environment, the public's health and safety, conformance with all applicable laws, ordinances, regulations and standards (LORS), and measures to mitigate any identified potential effects.

On June 15, 1998, the applicant filed its AFC with the Energy Commission, and on July 29, 1998, the Energy Commission found the AFC data adequate, formally accepting the AFC for analysis and consideration. The analyses contained in this document are based upon information from the AFC and subsequent revisions; responses to data requests; supplemental information from local, state and federal agencies, local citizens and interested parties; existing documents and publications; and independent field study. This SA presents staff's conclusions and recommendations for conditions of certification for the design, construction, operation and closure of the facility.

If the project is approved, construction is expected to take approximately 20 months. Construction is expected to begin in mid-1999 and to be completed by the end of the year 2000. Full scale commercial operation is expected by the end of 2000 or early 2001. During construction, the applicant anticipates a peak work force of approximately 299 craft laborers, supervisory, support and construction management personnel on-site during construction. Approximately 20 full-time

plant operators and technicians will be employed at PDEF once the plant is completed. The estimated capital costs of the project are between $200 - $300 million.

The applicant has identified the objectives of the PDEF to provide reliable electrical energy and steam to USS-POSCO, generate electricity for sale to the electricity market, and to assist the City of Pittsburg by building a new truck bypass road and facilitating economic development.

FINDINGS AND RECOMMENDATIONS

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

In our preliminary review of the PDEF, the following potential issues were identified in staff's August 24, 1998 Issues Identification Report:

1. Project-related emissions of SOx, NOx and PM10, a limit of 2.5 ppmvd (15% oxygen) for NOx as best available control technology (BACT), and needed offsets as required by the Bay Area Air Quality Management District (BAAQMD).

2. Effects of wetlands that may require jurisdictional determination, and a streambed alteration notification and agreement.

3. Unknown standards that would be necessary to ensure reliable interconnection to the Independent System Operator-controlled grid.

4. Possibility of a DDWTF expansion in order to accommodate the anticipated needs for tertiary treated wastewater and the need to make a final determination on the discharge method the applicant would use.

5. Compliance with local ambient noise requirements.

6. Cumulative environmental impacts of the PDEF and other projects in the Pittsburg area.

In December 1998, the applicant submitted a Supplement to the AFC that included the following project modifications:

- Rotation of the facility site plan 180 degrees placing the stacks further to the east away from residences.

- A reduction of the stack height from 175 feet to 150 feet.

- Redesign of all noise generating sources to reduce noise levels to minimize noise-related impacts identified by staff.

- Modification of plant operational conditions to substantially increase auxillary boiler hours of operation.

- Relocation of the construction laydown area to the east within USS POSCO property.

- Modification of several proposed transmission line and pipeline routes.

- Addition of four new transmission routes including routes 10 and 10(a), the above ground and below ground double circuit 115 kV line to connect at PG&E's Pittsburg power plant substation; route 11 which is the proposed route to supply electricity to USS POSCO; and route 12 which is an alternative pipeline corridor.

- Modifications to construction details such as equipment and workforce requirements.

These project modifications are intended to address many of the concerns raised by the public and staff in this case. However, since this information was submitted late in the Energy Commission staff's review of the PDEF, staff has not yet completed all of its analysis on these project modifications or received appropriate local agency input to make final determinations. In addition, the Energy Commission has received an AFC for another project in the Pittsburg area, the Delta Energy Center, which affects staff cumulative impacts analysis. The areas most affected include:

1) Air Quality – At the time this document was completed, the BAAQMD had not yet published its Preliminary Determination of Compliance (DOC) that will contain their preliminary findings and formally proposed permit conditions. In this document, staff indicates the remaining information required to complete its analysis, including the final DOC and a valid emissions offset package approved by the BAAQMD. Once staff receives this information, the analysis can be completed and additional conditions of certification recommended, if needed.

2) Visual Resources - Staff has identified potentially significant adverse impacts from the PDEF that require mitigation beyond what is proposed by the applicant in the visual resources area. This determination was made based on information submitted by the applicant through February 1999 and concerns the electric transition facilities and the nearest transmission line poles to the transition facilities. Staff has not yet had the opportunity to discuss this determination with the applicant, the local agencies, interested parties or the public to determine what appropriate mitigation can reduce this impact to a level of insignificance. Also, additional information was received in March 1999, too

late for consideration and incorporation into this analysis. Therefore, no conditions of certification are proposed to address this impact at this time.

3) Land Use – In its review of the PDEF, staff identified that the stacks associated with the facility will exceed the height limitations imposed by Pittsburg ordinances. The applicant has yet to apply for a variance to this restriction and thus the staff is not able to make a determination of compliance with this ordinance. Also, staff has recently received input from the City of Antioch regarding the natural gas pipeline, but was unable to reflect this input prior to the publication of this SA. In addition, staff expects additional input from the City of Pittsburg regarding the project as a whole. Once received, staff will review this input and make appropriate changes to their analysis and reflect these changes in their recommended conditions of certification.

4) Transmission System Engineering – Staff's analysis is based upon PG&E's Preliminary Facilities Study of the PDEF, the California Independent System Operator's (Cal-ISO) input and input from the applicant. At this time, staff cannot determine if there will be any downstream system upgrades required as a result of the PDEF being added to the system. Nor can staff identify what mitigation, if any, the Cal-ISO will require to ensure that the applicant complies with reliability criteria. PG&E will publish their Detailed Facilities Study for the PDEF approximately in May 1999.

5) Water Resources - The Delta Energy Center's (DEC) AFC was filed in December 1998. DEC, like PDEF will use effluent from the Delta Diablo wastewater Treatment Facility. Combined, the two projects will divert approximately 80 percent of the wastewater flow of the treatment plant. A significant portion of this flow to the two power plants is lost due to evaporation from the cooling cycle. The remaining flow is returned back to the wastewater treatment plant by PDEF and directly to the wastewater treatment plant outfall by DEC. A substantial portion of the inorganic constituents contained in the original effluent flow to the power plants, however, is concentrated in this remaining flow. Therefore, while total mass loading of these constituents to New York Slough will not change, the concentration of the wastewater treatment plant discharge will change, especially combined with the DEC discharge. Staff is evaluating potential impacts to water quality and anticipates that this information will be incorporated in its supplemental testimony to be filed in April 1999.

Energy Commission staff can not recommend approval of the PDEF at this time as it concerns air quality or visual resources. Nor can staff make a finding of conformity with the City of Pittsburg height restriction that pertains to the facility stacks. Energy Commission staff have scheduled workshops for March 23, 24 and 25, 1999 to discuss this SA and expect to be able to resolve many if not all of the remaining issues and potential impacts identified in this SA. Staff anticipates that it will submit supplemental testimony on air quality, visual resources, land use, transmission system engineering and water resources.

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INTRODUCTION

Testimony of M. Lorraine White

PURPOSE OF THIS REPORT

The California Energy Commission (Energy Commission) has the statutory authority to license thermal power plants 50 megawatts (MW) or greater. The Energy Commission's power plant certification process has responsibilities that are functionally equivalent to those of the lead agency under the California Environmental Quality Act. This Staff Assessment (SA) presents the Energy Commission staff's independent assessment of Pittsburg District Energy Facility, Limited Liability Corporation's (applicant) Application for Certification of the Pittsburg District Energy Facility (PDEF).

Evidentiary hearings will be conducted by the California Energy Commission's PDEF Siting Committee. These hearings are currently scheduled to occur between April 28 and May 5, 1999 and will be publicly noticed at least 15 days in advance. This report is prepared pursuant to Title 20, California Code of Regulations, Sections 1742.5, 1743 and 1744.

This report describes the following:

a. the proposed PDEF and the existing environmental setting;

b. whether the proposed PDEF and its ancillary facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);

c. the environmental consequences of the proposed PDEF using mitigation measures proposed by the applicant, Energy Commission staff, and other interested agencies;

d. the proposed conditions under which the proposed PDEF should operate if it is certified; and

e. project alternatives.

The assessment contained in this document is based upon information from the PDEF Application for Certification (Docket 98-AFC-1) filed on June 15, 1998, supplemental information filed by the applicant, specific responses by the applicant to Energy Commission data requests, information from local, state and federal agencies, interested individuals, intervenors, existing documents and publications, and independent field studies and research. This SA presents conclusions and recommended conditions of certification that apply to both the construction and operation of the proposed project.

ORGANIZATION OF THE REPORT

Staff's SA contains an Executive Summary, Introduction, Project Description, Technical Analysis, Project Alternatives and Findings of Need Conformance. Staff's Technical Analysis of the proposed PDEF is contained in the 19 technical area chapters, including: air quality, public health, worker safety and fire protection, transmission line safety, hazardous material management, waste management, land use, traffic and transportation, noise, visual resources, cultural resources, socioeconomics, biological resources, water resources, paleontologic resources, facility design, power plant reliability, power plant efficiency and transmission system engineering. These major technical areas are followed by a discussion of facility closure, project construction and operation compliance monitoring plan, witness qualifications, glossary of terms and a list of staff that assisted in preparing this report.

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

a. laws, ordinances, regulations and standards (LORS);

b. the regional and site-specific setting;

c. project specific, indirect and cumulative impacts;

d. mitigation measures;

e. conclusions and recommendations; and

f. conditions of certification (if applicable)

FEDERAL, STATE AND LOCAL AGENCY COORDINATION

Energy Commission staff have been working closely with representatives from the City of Pittsburg, City of Antioch and the County of Contra Costa to develop this SA. Other local agencies the staff has worked closely with include Delta Diablo Wastewater Treatment Facility and the Bay Area Air Quality Management District. In addition to the above agency coordination efforts, Energy Commission staff have coordinated their review and analysis of the PDEF with the California Independent System Operator, Pacific Gas and Electric (PG&E), California Unions for Reliable Energy, the U.S. Environmental Protection Agency, California Air Resources Board and the residents of the community.

CONCERNS OF THE LOCAL CITIZENS

Staff has conducted several public workshops in Pittsburg to discuss the proposed PDEF and related issues with the applicant, interested agencies, intervenors and the public. In addition, the PDEF Siting Committee held an Information and Site Visit hearing on September 3, 1998 and two status conferences (December 15, 1998 and February 17, 1999). These workshops focused on various issues of

concern raised by the public and interested parties at the Siting Committee meetings, discussed in staff's Issues Identification Report and indicated in staff's data requests. Public workshops were held on September 4, November 19, December 15, 1998 and February 9, 1999 in preparation of this SA. Workshops to discuss this SA and the recommendations it contains are scheduled for March 23, 24, and 25, 1999, and are to be held in Pittsburg.

The issues of primary interest to the public included: impacts to local air quality, use of reclaimed water for cooling purposes, noise, use of local workers, proximity of the PDEF to residents, visual aspects of the power plant and transmission lines, and cumulative impacts of the PDEF with other industrial facility in the Pittsburg area (including the proposed Delta Energy Center). We appreciate the comments and participation of the public in these workshops and have attempted to include these concerns in this document. Further input from the public is encouraged during the staff's SA workshops and the committee's evidentiary hearings that will follow.

PROJECT DESCRIPTION

Testimony of M. Lorraine White

NATURE AND PURPOSE OF PROJECT

The Pittsburg District Energy Facility, Limited Liability Corporation (hereafter referred to as "applicant") proposes to construct, own, operate and maintain the Pittsburg District Energy Facility (PDEF), a nominal 500 megawatt (MW) natural gas fueled, combined cycle, electricity cogeneration power plant. Two possible design configurations for the PDEF are proposed. The applicant's stated objectives for the project are to: serve the steam and electrical requirements of USS-POSCO Industries' (USS-POSCO) Pittsburg facility; sell electricity into the California electricity market; create a reliable power plant; and assist the City of Pittsburg.

Approximately 60 MW of electrical energy and industrial process steam produced by the power plant will be sold to USS-POSCO, the project's steam host, for use in their industrial processes. The remaining electrical energy will be sold to the regional power pool and other customers as appropriate. Overall anticipated availability for PDEF is at least 95 percent, operating approximately 8760 hours annually. The proposed project is a merchant facility, imposing no cost or feasibility risk to ratepayers.

PROJECT LOCATION

As proposed, the PDEF site is located in the City of Pittsburg in eastern Contra Costa County just south of New York Slough. (See **PROJECT DESCRIPTION Figure 1**) The applicant proposes to construct the power plant on 12 acres of an existing industrial site, owned and controlled by USS-POSCO, south of east 3rd Street between Harbor and Columbia Streets (part of Contra Costa County Assessor's Parcel Number 070-30-12). During the construction phase, the applicant also proposes a temporary 20-acre construction laydown area adjacent to and south of the proposed power plant site. (See **PROJECT DESCRIPTION Figure 2**)

PROJECT DESCRIPTION

The applicant has proposed two alternative configurations for a combined cycle combustion turbine generator (CTG) design with a nominal capacity of 500 MW. One design would consist of two trains of "F" class CTG machines with a steam turbine generator in line with each CTG (the two, one-on-one configuration – see **PROJECT DESCRIPTION Figure 3**). The other design consists of two trains of "F" class CTG with only one steam turbine generator between them (the two-on-one configuration). Please see the **FACILITY DESIGN** section for a more detailed description. Natural gas is burned in the combustion turbine generators, which converts the thermal energy into mechanical energy required to drive the compressor and electric generator.

PROJECT DESCRIPTION Figure 1
Regional Setting

PROJECT DESCRIPTION Figure 2
Local Setting

The combustion turbine trains will include 150 ft. exhaust stacks (17 ft.- 6 in. in diameter) to the east of the site and step-up transformers, heat recovery steam generator (HRSG) units, steam turbine generator units and their transformers, and water treatment and cooling towers. An auxiliary boiler is proposed to boost power output. The proposed steam pipeline is expected to be six-tenths of a mile, traveling east then south to USS-POSCO's Boiler Plant #2.

Nitrogen oxide (NO_x) emissions from the combustion process will be reduced to 2.5 parts-per-million by volume dry (ppmvd), or less, at 15 percent oxygen by utilizing dry low NO_x combustion technology and a selective catalytic reduction (SCR) system. The SCR system will use aqueous ammonia for the reduction process.

Additional facilities proposed as part of this project include a combined control room/administrative building, an electrical control building and a combined warehouse/shop building. A list of the major structures and equipment proposed for the PDEF is contained in **PROJECT DECRIPTION Table 1**. All of the proposed and alternate routes for the linear facilities (e.g., transmission lines and pipelines) is shown in **PROJECT DESCRIPTION Figure 4**.

TRANSMISSION FACILITIES

The applicant has proposed construction of two separate transmission lines with related facilities. The first is a 115 kilovolt (kV) high-voltage switchyard will be located on the west side of the proposed project site. To serve the electrical requirements of USS-POSCO, the applicant proposes to construct a new 115 kV single circuit transmission line to be located entirely on USS-POSCO property (AFC Supplement route 11). The transmission line will be strung overhead on 130 ft. steel lattice towers or tubular poles spaced 500 to 700 feet apart (see **PROJECT DESCRIPTION Figure 5**). It would travel south from the PDEF switchyard then east just below the construction laydown area to two of USS-POSCO's existing substations. Route 11 is approximately one mile long. An alternate route (AFC Supplement route 2) would have the transmission line exit the site to the east along 3rd Street to approximately Columbia Street and then turn south. Just before Sante Fe Avenue, the line would then turn east to the USS-POSCO facility. Sections of this alternate route would parallel existing 115 kV lines.

PROJECT DESCRIPTION Figure 3
Pittsburg District Energy Facility 1x1 Configuration

PROJECT DESCRIPTION Figure 4
Pittsburg District Energy Facilities – Linear Facilities

PROJECT DESCRIPTION Figure 5
Transmission Tower – Single Circuit

PROJECT DESCRIPTION Table 1
Pittsburg District Energy Facility - Major Structures and Equipment

DESCRIPTION	Length ft.	Width ft.	Height ft.
Combustion Gas Turbines w/ Starter Package (CT)	70	40	20
CT Air Inlet Filters w/ Air Cooling	70	30	45
Generators w/ Enclosure	20	15	10
Fuel Gas Filter – Separator	20	20	10
Heat Recovery Steam Generators (HRSG)	135	40	70
HRSG Stacks		17'-6" dia	175
Selective Catalytic Reduction Skids	20	15	10
Auxiliary Boiler	50	50	50
Auxiliary Boiler Stack		4' dia	100
Aqueous Ammonia Storage Tanks		10' dia	18
Water Treatment Building	160	60	20
Demineralized Water Storage Tank		40' dia	30
Reclaimed Water Storage Tank		60' dia	30
Steam Turbine Pedestal w/Turbine, Generator, Condenser	95	40	40
Wet Cooling Tower	330	55	40
Administration Building / Control Room	90	50	15
Warehouse / Shops	40	40	20
Switchyard Busses and Towers	500	215	35
Electrical Control Building	50	50	15
Transmission Line Towers	40	40	130 150

Source: PDEF AFC, June 1998, Table 3.4.1-2

The second transmission line will deliver electricity to the state's transmission grid via a new 2 mile double circuit 115 kV overhead/underground electric transmission line connecting the PDEF switchyard to Pacific Gas & Electric's (PG&E) existing substation at the Pittsburg Power Plant (AFC Supplement route 10). The applicant proposes an overhead transmission line traveling south west from the PDEF to approximately the corner of 8th and Harbor Streets. The line will then transition underground and travel west approximately one mile in the 8th Street median. Just north of the 8th and Beacon Streets intersection, the line will resurface and travel overhead north to the PG&E substation.

The overhead portions of this second transmission line will be strung on 150 ft. steel lattice towers or tubular poles spaced 500 –700 ft. apart (see **PROJECT DESCRIPTION Figure 6**). Overhead/underground transitional facilities will be constructed near the corners of Harbor and 8th Streets, and 8th and Beacon Streets. The footprint for these facilities will be approximately 90 ft. by 50 ft. with the superstructures approximately 30 ft. tall. The underground portion of the transmission line along 8th Street will be in a standard double circuit duct bank. The trench dimensions for this duct bank are approximately 6 ft. - 6 in. by 23 ft. wide.

PROJECT DESCRIPTION Figure 6
Transmission Tower – Double Circuit

Two alternate transmission lines are proposed to connect the PDEF into the state's transmission grid. One alternate is similar to the above proposed route traveling from the PDEF to the PG&E Pittsburg Power Plant substation. Instead of traveling north just past the 8th and Beacon Streets intersection, the alternate would travel further west approximately 0.5 miles and then turn northeast to the substation (AFC Supplement route 10a). The other alternate route would connect the PDEF to the grid at the existing PG&E #32 Columbia Street Tap (AFC Supplement route 1). This alternate double circuit, 115 kV overhead transmission line is approximately 0.9 miles long and would travel south from the PDEF to East Santa Fe Avenue and then east for a short distance then north to connect at the Tap.

WATER SUPPLY

Tertiary treated water for turbine cooling will be supplied from the Delta Diablo Wastewater Treatment Facility (DDWTF) located in the City of Antioch. New 16 in. diameter underground supply and discharge pipelines will be built from DDWTF south to the Pittsburg-Antioch Highway and then travel west to Columbia Street and then north to the PDEF (AFC Supplement route 4). These lines are approximately 2 miles long. An alternate route for the pipelines would have the lines travel north from the Pittsburg-Antioch Highway at the existing PG&E Columbia Steel 115 kV transmission line and then west at the AT&SF railroad tracks. The lines would then parallel the railroad tracks until Columbia Street where it would turn north to the PDEF (AFC Supplement route 50).

Potable water will be supplied to the PDEF by the City of Pittsburg and used for firewater, drinking, safety showers, sanitary facilities and as emergency back-up to DDWTF. A short 500 ft. underground water supply line will be constructed to the city's existing service line.

NATURAL GAS PIPELINE

The applicant proposes to build a new 10-in. diameter fuel gas pipeline from the PDEF to PG&E's existing SP-5, 30-in. diameter gas line 3.6 miles southeast of the plant site. The proposed gas pipeline is sized to permit operation of the turbines and duct burners at full power. The trench for this underground pipeline is 2 ft. wide by 5 ft. deep.

TRUCK BYPASS ROAD

As part of this project, the applicant is proposing to construct a two-lane truck bypass road. The stated purpose of this road is to support the City of Pittsburg's effort to reroute existing marine terminal truck traffic as well as provide improved access to the project site. The road will be approximately 0.75 mile long. It will connect East 14th Street, near the existing intersection of Columbia and East 14th Streets, to Harbor Street, near the existing intersection of Santa Fe Boulevard and Harbor Street. (See PROJECT DESCRIPTION Figure 2) This truck bypass road will be built on USS-POSCO and Union Pacific Railroad property.

A 12-ft. sound wall will be constructed along the west and south of the road. Landscaping will be use along the road and sound wall. In order to construct this

truck bypass road, the baseball diamond to the east of the Columbia Street and north of East 14th Streets will be relocated to the east in the lot adjacent to the existing baseball diamond.

CONSTRUCTION AND OPERATION

If approved, construction of the PDEF project, from site preparation to commercial operation is expected to take approximately 20 months. The applicant anticipates construction to begin in mid-1999 and to be completed by the end of the year 2000. Full scale commercial operation is expected by the end of 2000 or early 2001. During construction, the applicant anticipates a peak work force of approximately 299 craft laborers, supervisory, support and construction management personnel on-site during construction. The average work force over the entire construction period is estimated to be about 170 personnel. The total construction payroll is estimated at $26.4 million. The applicant expects to employee about 20 full-time plant operators and technicians once the plant is complete with an estimated annual payroll of approximately $1.4 million. The estimated capital costs of the project are between $200 - $300 million.

NEED CONFORMANCE

Testimony of Connie Leni

Under state law, the Energy Commission cannot certify a proposed electric generating facility unless it finds that the project conforms with the Integrated Assessment of Need contained in the Energy Commission's most recent *Electricity Report.* This analysis examines whether the Pittsburg District Energy Facility (PDEF) conforms to the Energy Commission's Integrated Assessment of Need.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

STATE

California Code of Regulations

California Code of Regulations states "The presiding member's proposed decision shall contain the presiding member's recommendation on whether the application shall be approved, and proposed findings and conclusions on each of the following: (a) Whether and the circumstances under which the proposed facilities are in conformance with the 12-year forecast for statewide and service area electric power demands adopted pursuant to Section 25309(b) of the Public Resources Code." (Cal. Code of Regs., tit. 20, § 1752(a).)

Public Resources Code

The Energy Commission's Final Decision must include, among other things, "Findings regarding the conformity of the proposed facility with the integrated assessment of need for new resource additions determined pursuant to subdivision (a) to (f), inclusive, of Section 25305 and adopted pursuant to Section 25308 or, where applicable, findings pursuant to Section 25523.5 regarding the conformity of a competitive solicitation for new resource additions determined pursuant to subdivisions (a) to (f), inclusive, of Section 25305 and adopted pursuant to Section 25308 that was in effect at the time that the solicitation was developed." (Pub. Resources Code, § 25523(f).)

Need Conformance Criteria

In order to obtain a license from the Energy Commission, a proposed power plant must be found to be in conformance with the Integrated Assessment of Need. The criteria governing this determination are contained in the *1996 Electricity Report (ER 96)*, and are most succinctly described on page 72 of that document:

> "In sum, the *ER 96* need criterion is this: during the period when *ER 96* is applicable, proposed power plants shall be found in conformance with the Integrated Assessment of Need (IAN) as long as the total number of Megawatts permitted does not exceed 6,737."

CONCLUSIONS AND RECOMMENDATIONS

ER 96 was adopted by the Commission on November 5, 1997. PDEF was found data adequate on July 29, 1998. Therefore, *ER 96* is the *Electricity Report* adopted most recently prior to the project being found data adequate. Staff evaluated the project based on *ER 96* Need Conformance Criteria.

Staff finds that the PDEF meets the need conformance criteria contained in *ER 96*. The certification of the project would not cause the number of megawatts permitted in this case, and any others previously approved by the Commission under *ER 96*, to exceed 6,737. Therefore, the PDEF is in conformance with the Integrated Assessment of Need.

AIR QUALITY

Testimony of Guido Franco and Mike Ringer

INTRODUCTION

This analysis addresses the potential air quality impacts resulting from criteria air pollutant emissions created by the construction and operation of the Pittsburg District Energy Facility (PDEF). Criteria air pollutants are those for which a state or federal standard has been established. They include nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3) and its precursors (nitrogen oxides (NO_x) and volatile organic compounds (VOC)), and particulate matter less than 10 and 2.5 microns in diameter (PM10 and PM2.5) and their precursors: NO_x, VOC, and SO_x.

In carrying out its analysis, the California Energy Commission staff evaluates the following points:

- whether the PDEF project is likely to conform with applicable Federal, State, and Bay Area Air Quality Management District (BAAQMD) air quality laws, regulations and standards, as required by Title 20, California Code of Regulations, section 1742.5 (b),

- whether the PDEF is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, section 1742(b), and

- whether the mitigation proposed for the PDEF is adequate to lessen the potential impacts to a level of insignificance, as required by Title 20, California Code of Regulations, section 1744(b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

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

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

The U.S. Environmental Protection Agency (EPA) has reviewed and approved the Bay Area Air Quality Management District 's (BAAQMD) regulations and has delegated to BAAQMD the implementation of the federal PSD, Non-attainment NSR, and Title V programs. The BAAQMD implements these programs through its own rules and regulations, which are, at a minimum, as stringent as the federal regulations.

STATE

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

The state's Air Resources Board (ARB) promulgates state-level ambient air quality standards, which are, in general, more stringent than the national ambient air quality standards. Table 5.2-2 in the Application for Certification (AFC) presents a summary of the current national and state ambient air quality standards.

LOCAL

The proposed facility is subject to various BAAQMD rules and regulations. Regulation 2, Rule 2 is the more relevant local air quality rule for this project. This rule, entitled "New Source Review," applies to all new and modified stationary sources. It defines requirements related to Best Available Control Technology (BACT), offsets, emission calculation procedures to estimate bankable emission reduction credits (ERCs), and requirements for the federal acid rain program.

A more complete discussion of the applicable rules and regulations can be found in section 5.2.2.4 Regulatory Setting of the AFC. An in-depth discussion how the PDEF will comply with all applicable rules and regulations will be provided in the BAAQMD's Preliminary Determination of Compliance (PDOC), which is to be issued in early March, 1999.

SETTING

METEOROLOGY AND CLIMATE

A good presentation of the meteorological and climatological characteristics of the region can be found in section 5.2.2 of the AFC. In addition, the BAAQMD has

published an excellent discussion on this subject, entitled “Climate, Physiography, and Air Pollution Potential - Bay Area and its Subregions” (BAAQMD, 1999).

PDEF would be located in a climatological subregion of the Bay Area known as the Carquinez Strait region. This region covers the areas surrounding the Carquinez Strait, including cities such as Martinez, Pittsbug, Antioch, Fairfield, and Suisun City.

The Carquinez Strait is characterized by prevailing strong winds from the west, particularly during the summer. However, sometimes a weak westerly flow or flow from the east develops, causing elevated pollutant levels in the Bay Area. During these periods the Bay Area, in general, is affected by low wind speeds and shallow mixing depths, thereby allowing the build up of pollution levels (BAAQMD, 1999).

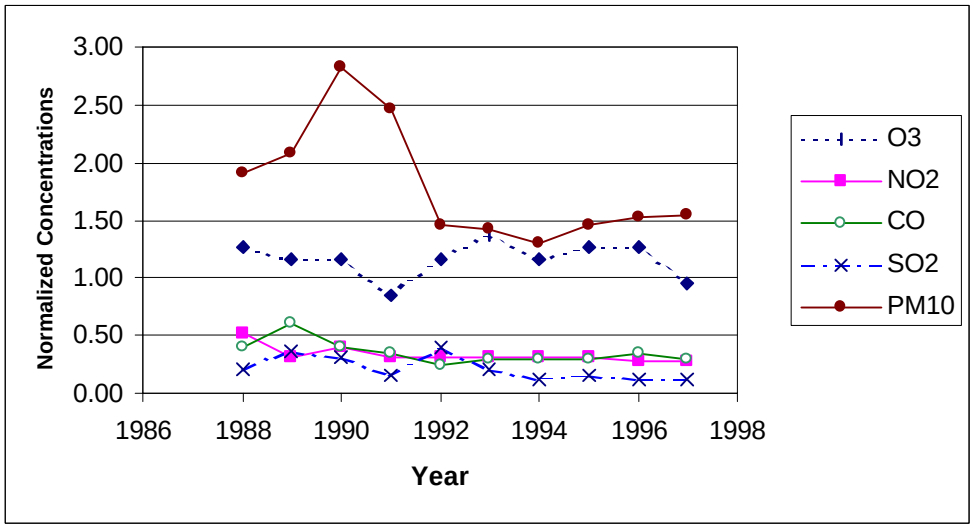
Pacific Gas and Electric (PG&E) collects meteorological data in Pittsburg. The data collected or subsequently estimated by PG&E includes wind direction, wind speed, temperature, and atmospheric stability class. The data collection monitor is located approximately 1.5 kilometers (less than a mile) west from the proposed project. The BAAQMD has deemed the data collected by this monitor as representative of the area’s meteorology, and that it is appropriate to use for air dispersion modeling analyses for this project.

EXISTING AMBIENT AIR QUALITY

A very good summary of the existing ambient air quality conditions in the Pittsburg area can be found in the AFC Table 5.2-3 and in the recent Application for Certification for the Delta Energy Center (DEC, 1998). **AIR QUALITY Figure 1** summarizes the historical air quality data for Pittsburg for particulate matter less than 10 microns (PM10), CO, SO_2, O_3, and NO_2. In **AIR QUALITY Figure 1** normalized concentrations are presented, which represent the ratio of the highest measured concentrations in a given year to the most stringent applicable national or state ambient air quality standard. Therefore, normalized concentrations lower than one indicate that the measured concentrations were lower than the most stringent ambient air quality standard. The particulate matter data correspond to the data collected at Bethel Island, which has traditionally been higher than the concentrations measured at other sites in Contra Costa County.

Following is a more in-depth discussion of ambient air quality conditions in the Pittsburg area for O_3, CO, NO_2, and PM.

AIR QUALITY Figure 1
Normalized Maximum Short-Term Historical Air Pollutant Concentrations:1988-1997. Pittsburg Area



A Normalized Concentration is the ratio of the measured concentration to the applicable most stringent air quality standard. For example, in 1997 the highest 24-hour average PM10 concentration measured in Bethel Island was 77 $\mu g/m^3$. Since the most stringent ambient air quality standard is 50 $\mu g/m^3$, the 1997 normalized concentration is 77/50 = 1.54.
Source: ARB, 1998a as reported in DEC, 1998.

OZONE

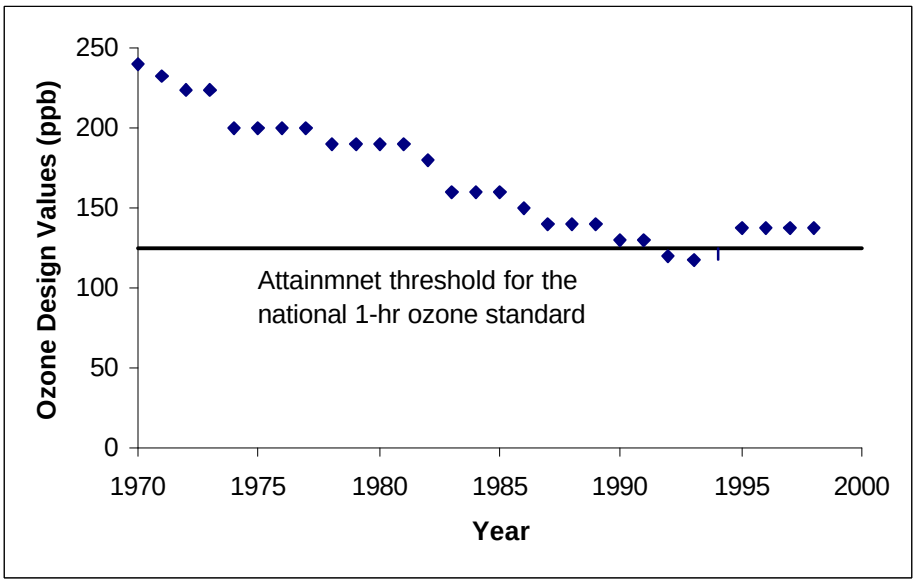
The Pittsburg area has experienced, in general, an average of four or five days with violations of the 1-hour state ambient air quality standard for ozone in a year and it may be in violation of the new 8-hour national ambient air quality standard for ozone. This new national standard, adopted in 1997, is more stringent than the previous 1-hour national ambient air quality standard but less restrictive than the state standard. The EPA still applies the 1-hour national ozone standard to areas that have been unable to attain the previous national ozone ambient quality standard. The San Francisco Bay Area is one of the areas in this situation.

Ozone formation is influenced significantly by year-to-year changes in atmospheric conditions. For this reason, a long-term trend in ambient ozone levels is needed to understand if a region is experiencing reductions in its ambient ozone concentrations or not. As shown in **AIR QUALITY Figure 2**, the long-term statistics of ozone levels in the San Francisco Bay Area region shows that this region has made significant strides toward attainment of previous federal ozone 1-hour standard.

The reasons for the recent violations of the federal ozone standard shown in the **AIR QUALITY Figure 2** are not known. However, one important characteristic of the last few years is that more exceedances have been observed during weekends, when NO_x emissions are expected to go down by 30 percent, and VOC emissions would only be reduced by 10 percent from the emission levels expected during

weekdays (SCAQMD 1997). The "weekend effect", modeling analyses, and other corroborative analyses suggest that the air basin may be VOC limited. This means that any reductions in NO_x emissions may be counterproductive unless accompanied by reductions in VOC emissions. The BAAQMD is developing its 1999 State Implementation Plan (SIP) to identify a strategy to bring the air basin back to attainment of the national 1-hour standard (BAAQMD 1998). Additional studies will be conducted in the future to better understand the ozone problem in the Bay Area air basin and surrounding air basins. The study results will be used to develop equitable and more effective air quality management strategies to reach attainment of federal air quality standards.

AIR QUALITY Figure 2
District Ozone Design Value 1970-1998



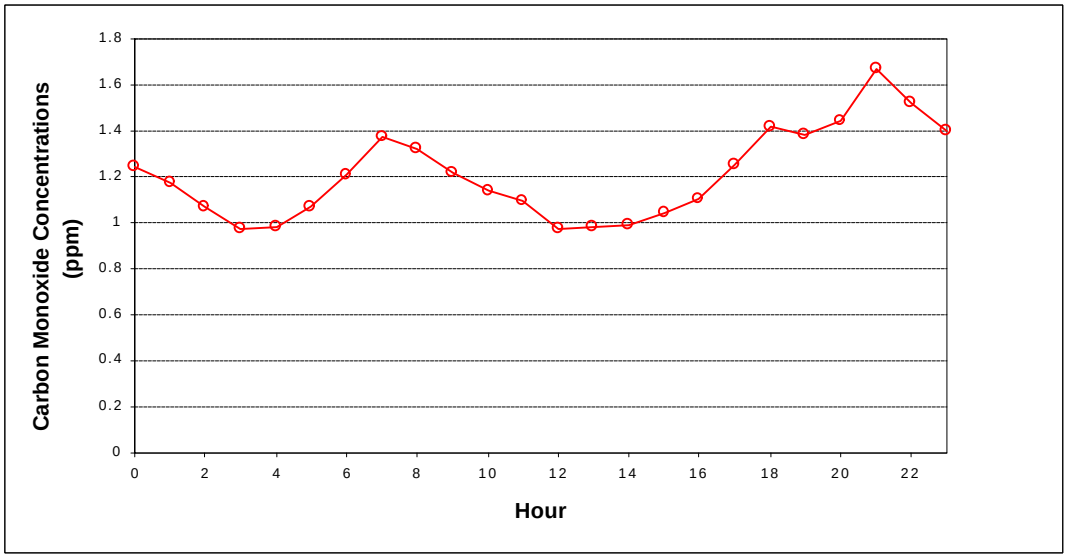
Each design value represents the fourth highest concentration recorded in the air basin during the previous three years. Design values are used to determine attainment status.
Source: BAAQMD, 1998

While high maximum hourly ozone concentrations are important, they do not reflect the geographical and temporal extent of ozone levels. The population weighted ozone exposure level is a better measure of public exposure and a more meaningful measure of public health concerns. This parameter has had a downward trend in Contra Costa County. For example, the most recent estimated per capita ozone exposure levels above the state standard in the 1994-1996 period are 16 percent lower than the values measured in the 1986-88 period (BAAQMD 1997a). Pittsburg does not experience, in general, violations of the less stringent national ozone 1-hour average ambient ozone air quality standard. As indicated above, the U.S. EPA adopted in 1997 a more stringent ozone standard that is set at a level of 80 parts per billion (ppb), averaged over an 8 hour period. Attainment designations with regard to this new standard will occur in the year 2000 and air quality management plans which will identify attainment strategies, if needed, are due in 2003. It is likely that the Bay Area air basin will be in non-compliance with the new ozone standard and, therefore, reductions of ozone precursor (NO_x and VOC) emissions will continue to be required in the foreseeable future.

CARBON MONOXIDE (CO)

The highest CO concentration levels measured in Pittsburg are at least one-half lower than the most stringent California ambient air quality standards (see **AIR QUALITY Figure 1**). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since the mobile sector (cars, trucks, busses) is the main source of CO, we expect ambient concentrations of CO to be highly dependent on emissions from the mobile sector. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. In Pittsburg CO concentrations may also peak late in the evening, as shown in **AIR QUALITY Figure 3**. This is probably the result of CO emissions from wood burning in residential fireplaces in Pittsburg and/or adjacent areas.

AIR QUALITY Figure 3
Average Diurnal CO Profile
Pittsburg, January 1 - 15, 1996



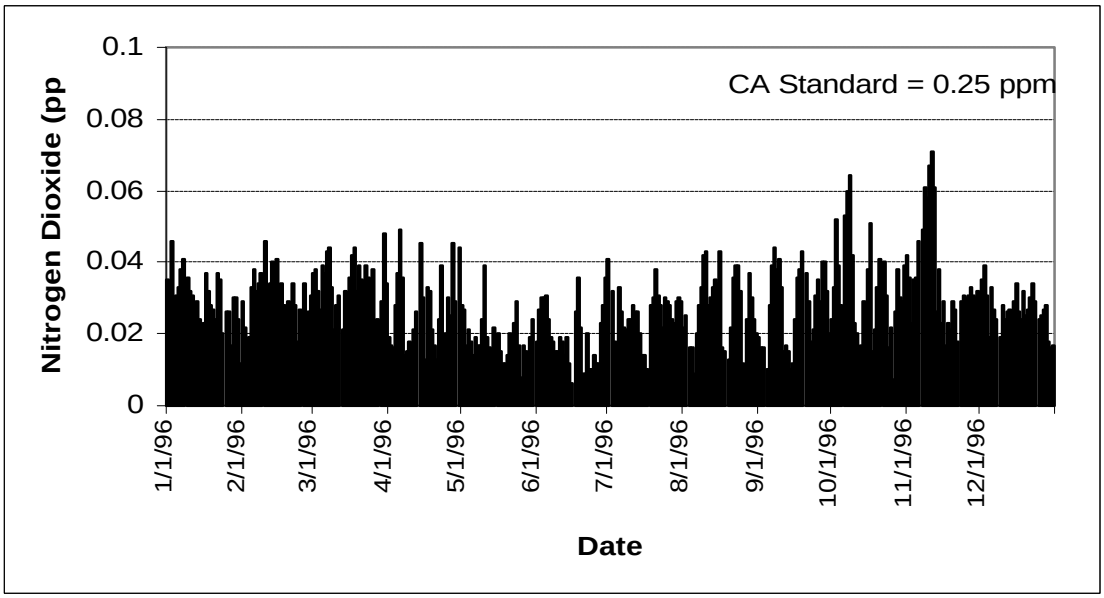
Source: ARB, 1998a

Carbon monoxide concentrations in Pittsburg and the rest of the state have declined significantly due to two state-wide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to the decline in CO levels in the state. Today all the counties in California, with the sole exception of Los Angeles County, are in compliance with the CO ambient air quality standards. Recently the California Air Resources Board rescinded the requirements for a minimum level of oxygen in the wintertime fuel when allowed by federal law (ARB 1998b). Even with this action, county-wide and state-wide forecasted CO inventories show a decline (ARB, 1998b). Therefore, compliance with the CO standards are expected to continue in the future.

NITROGEN DIOXIDE (NO_2)

NO_2 levels in Pittsburg are no more than one-half of the most stringent NO_2 ambient air quality standards, as shown in **AIR QUALITY Figure 1**. Approximately 90 percent of the NO_x emitted from combustion sources is NO, while the balance is NO_2. NO is oxidized in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 occur during the fall (see **AIR QUALITY Figure 4**) and not in the winter when atmospheric conditions favor the trapping of ground level releases but lack significant photochemical activity (less sun light). In the summer the conversion rates of NO to NO_2 are high but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard.

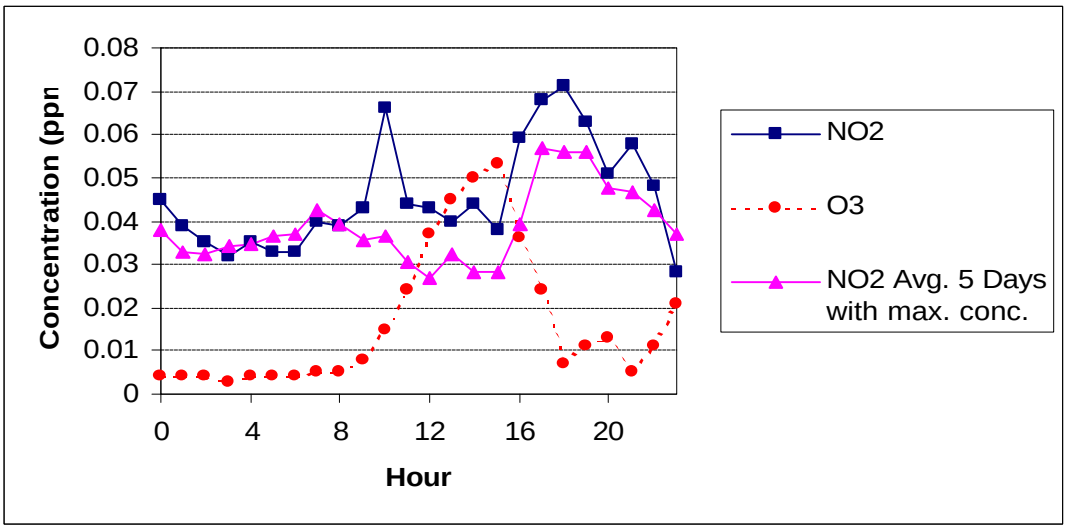
AIR QUALITY Figure 4
Maximum Daily 1-hour average NO_2 Concentrations measured in 1996: Pittsburg Station



Source: ARB,1998a

AIR QUALITY Figure 5 presents the diurnal profile of NO_2 and O_3 concentrations observed on November 11, 1996 (Monday) when the highest ambient 1-hour NO_2 concentration was recorded in 1996. This figure also shows the average diurnal NO_2 profile for the five days with the highest measured concentrations in 1996, all occurring in the fall.

AIR QUALITY Figure 5
Diurnal Profile for NO_2 and O_3
Pittsburg Station: 11/11/96 and five days with the maximum concentrations



Source: ARB, 1998a.

One important thing to notice from **AIR QUALITY Figure 5** is that the maximum NO_2 concentrations that occur late in the afternoon are possibly linked to the rapid reaction of NO emissions from ground level sources with the ground level ozone, as shown in the following equation:

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

As indicated before, fresh NOx (NO plus NO_2) emissions from combustion sources are mainly NO emissions. The above reaction explains why, in urban areas, ozone concentrations at ground level drop substantially at night, while aloft and in rural areas (without sources of fresh NO_x emissions) ozone concentrations can remain relatively high.

PARTICULATE MATTER (PM)

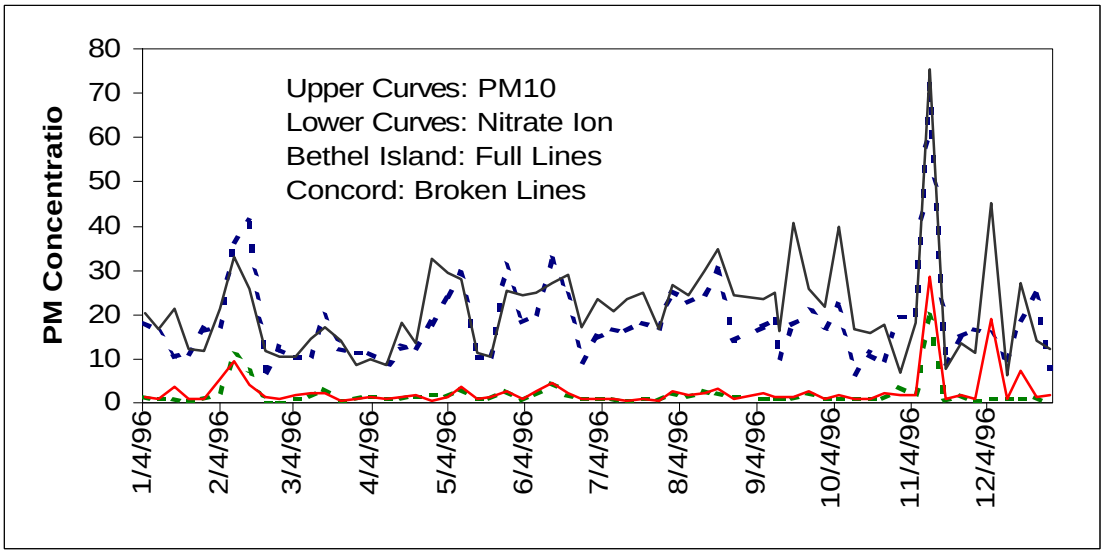
As shown in **AIR QUALITY Figure 1**, PM concentrations measured at the Bethel Island monitoring station declined in the last few years. The same trend has been observed at other sites at Contra Costa County, including the City of Concord.

One issue that has been raised by the public is the lack of a PM monitoring station in Pittsburg. The concern is that PM concentrations in Pittsburg may be higher than the PM concentrations in Concord (the measurements used by the applicant in its analysis). To address this issue, we will use in our analysis the PM concentrations measured at Bethel Island, which have been traditionally the highest measured concentrations in the county. In addition, as shown in **Air Quality Figure 6**, PM concentrations in both Concord and Bethel Island track each other reasonably well, suggesting that Pittsburg should also have a similar PM profile. This is confirmed by the measurements taken in Crockett a few years ago, which show that PM concentrations there were not significantly different from concentrations measured

at other Contra Costa County sites and were lower than measurements taken at Bethel Island.

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NO_x emissions from combustion sources. **AIR QUALITY Figure 6** also shows that the nitrate ion concentrations during the winter time are a significant portion of the total PM10 and should be even a higher contributor to the particulate matter of less than 2.5 microns (PM2.5). The nitrate ion is only a portion of the PM nitrate, which can be in the form of ammonium nitrate (ammonium plus nitrate ions) and some as sodium nitrate. If we consider the ammonium and the sodium associated with the nitrate ion, we can estimate much higher PM nitrate contributions to the total PM than can be inferred by just looking at **AIR QUALITY Figure 6**.

AIR QUALITY Figure 6
Total PM10 and PM Nitrate Ion
Measured in Concord and Bethel Island: 1996



Source: ARB, 1998a

In 1997, the U.S. EPA established a new ambient air quality standard for PM2.5. The air agencies in California are now deploying PM2.5 ambient air quality monitors throughout the state. Attainment designations are expected in 2003 based on measurements to be taken a few years before 2003. PM2.5 ambient air quality attainment plans, if needed, are due to the U.S. EPA by 2005. As with PM10, information from existing PM2.5 research monitors in California indicates that there have been significant reductions in ambient PM2.5 concentrations in the state (Watson 1998) and that the San Francisco Bay Area air basin may be in attainment of the new PM2.5 standards.

The highest PM concentrations are measured in the winter. During wintertime high PM episodes, the contribution of ground level releases to ambient PM concentrations are disproportionately high. For example, wood smoke contributes

approximately 47 percent of the PM10 mass in San Jose, while the contribution at Pittsburg may be on the order of 30 percent (Chow et al. 1995). The contribution of woodsmoke particles to the PM2.5 concentrations may be even higher, considering that most of the woodsmoke particles are smaller than 2.5 microns.

OTHER AIR POLLUTANTS

There are also ambient air quality standards for sulfates and lead. A full description of the measured ambient air concentrations in Pittsburg is contained in section 8.1.3 of the AFC for Delta Energy Center (DEC, 1998). The ambient concentrations of these pollutants are well below their respective standards.

PROJECT ESTIMATED EMISSIONS

CONSTRUCTION PHASE

The construction phase includes the power plant and ancillary facilities (i.e., steam line, 115 kW transmission lines, and pipelines for reclaimed water, natural gas, fire and potable water). In addition, the PDEF has committed to build a truck bypass road. The construction of the proposed power plant will result in temporary emissions for approximately 18 months.

All construction scheduling is based on a 40-hour work week that is expected to occur during weekdays from 6 a.m. to 6 p.m. Tables E 5.2-7 and 5.2-8 in the AFC present detailed construction emission estimates for PM10, NO_x, CO, SO_x, and VOC emissions from vehicles and equipment combustion and from site grading activities. It is important to understand that construction estimated emissions are highly speculative since detailed activity data can not be forecast accurately and the emission factors used in these estimations are known to be conservative estimates. For example, the Air Resources Board has recently measured PM emissions from actual construction sites and has revised its estimated PM10 construction related emissions downward by 67 percent (ARB 1997).

COMMISSIONING AND OPERATIONAL PHASES

The proposed PDEFis a combined cycle power plant with two different power trains. Each power train consists of a gas turbine and a heat recovery steam generator (GT/HRSG). The steam from the heat recovery steam generator will be fed to a steam turbine and part of it will be delivered to USS-POSCO. The facility will also include an auxiliary boiler to operate up to 1,500 hours in a year and a six-cell mechanical cooling tower.

The PDEF will burn only natural gas with no provisions for an alternative backup fuel. The exclusive use of an inherently clean fuel, natural gas, will limit the formation of VOC, PM10, and SO_x. The combustion turbine will be equiped with low-NOx combustors to minimize NO_x formation. After combustion, the flue gases will be treated by Selective Catalytic Reduction (SCR) systems to further reduce NO_x emissions. Another catalyst, an oxidizing catalyst, will also be installed to

reduce mainly CO emissions but we also expect some reductions in VOC emissions.

"Commissioning" is the technical term used to describe, in general, all the operations of the power plant once it has been physically installed but not yet in commercial operation. Commissioning starts with the first firing of fuel in the GT/HRSG or in the auxiliary boilers. During commissioning the control systems are tested, the burners are tuned up, the inside and outside of tubes are cleaned up, and the control systems are installed after determining that there are no contaminants in the GT/HRSG that may damage the surfaces of the catalysts. It is important to emphasize that for a short period of time the power plant will operate without emission controls. Commissioning ends with the start of commercial operation, which is usually signaled by the issuance of the Permit to Operate (PTO) from the local air district.

AIR QUALITY Table 1 presents the estimated maximum emission rates for CO and NO_x over different averaging times. The table also shows that BAAQMD has proposed to limit maximum daily emissions. In addition, the BAAQMD has proposed permit conditions to include total emissions during Commissioning as part of the annual emission budget.

CO and NO_x emissions are relatively easy to measure, even during commissioning, because calibrated continuous emission monitors for both pollutants will be installed before commissioning begins. The amount of fuel burned and the sulfur content of the fuel will limit SO_x emissions. Limitations on CO emissions implicitly limit VOC emissions since it has been observed that there is a similar trend in emissions between CO and VOCs (Crockett 1997). Finally, PM10 emissions during commissioning are not expected to exceed the daily emissions established for normal operation because natural gas combustion does not produce high PM emissions and the amount of fuel consumed during this period is expected to be lower than during normal operations.

AIR QUALITY Table 1
Maximum Emission Rates and Total Daily Emissions During Commissioning per Gas Turbine

Pollutant/Averaging Time	Maximum Emission Rates (g/sec)	Maximum Total Daily Emission (lb)
CO 1-hour	318.39	3,400
CO 8-hour	61.79	
NO_x 1-hour	39.69	680

AIR QUALITY Table 2 shows the enforceable maximum hourly, daily, and annual emissions included in the proposed permit conditions provide informally by the BAAQMD at the Energy Commission staff workshop held on February 9, 1999. **AIR QUALITY Table 3** contains similar information with respect to fuel consumption levels. If adopted these maximum enforceable fuel consumption and emission

levels will be continuously monitored with the instrumentation and measuring devices required by the BAAQMD proposed permit conditions.

In the SCR system which is proposed by the applicant, ammonia reacts with NO_x forming nitrogen and water. However, not all of the ammonia reacts, leaving the stack in what is known as an "ammonia slip." The BAAQMD's proposed permit conditions limit the amount of ammonia slip to 10 part per million (ppm). In practice, recently licensed power plants in California operate at much lower ammonia slip levels.

FACILITY CLOSURE

Eventually the PDEF will close, either as a result of the end of its useful life, or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, then all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur.

The Permit to Operate, issued by the BAAQMD, is required for operation of the facility and is usually renewed on a five year schedule. However, during those five years, the applicant must still pay permit fees annually. If the applicant chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the applicant pays the fees to renew the Permit to Operate.

If PDEF were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should indicate that the applicant will comply with the applicable construction related permit conditions included in the Conditions of Certification.

PROJECT INCREMENTAL IMPACTS

The BAAQMD and Energy Commission staff reviewed and required modifications to the air quality modeling analysis prepared by the applicant. In this section we summarize the modeling results (the complete modeling analysis is already part of the record), and provide a more detailed discussion of certain modeling issues and results not covered in the applicant's analysis.

MODELING APPROACH

The applicant used the SCREEN model to select the worst case turbine configuration that would produce the highest impacts. The SCREEN model is an approved U.S. model designed to provide conservative estimation of impacts. Based on the results of the SCREEN model, the applicant modeled the Westinghouse gas turbine and HRSG configuration using a more refined modeling analysis. This more refined modeling analysis was done with the Industrial Source Complex (ISC) model, using near-by meteorological data collected at the PG&E Pittsburg power plant.

AIR QUALITY Table 2
Maximum Hourly, Daily, and Annual Emissions

	NO_x			CO			VOC			PM			SO_x		
	lb/hr	lb/day	tons/yr	lb/hr	lb/day	tons/yr	lb/hr	lb/day	tons/yr	lb/hr	lb/day	tons/yr	lb/hr	lb/day	tons/yr
GT1	17.5	664	151	25.4	2621	480	10	672	125	17	410	121	5.58	130.4	-
GT2	17.5	664		25.4	2621		10	672		17	410		5.58	130.4	
Boiler	2.9	70	3	9.8	234	7.3	0.4	8.6	0.3	1.3	31	2	0.15	3.6	-
Cooling Tower	-	-	-	-	-	-	-	-	-	0.4	10.6	1	-	-	-
GT-S	223	-	-	1821	-	-	239	-	-	-	-	-	-	-	-
GT-SD	58	-	-	238	-	-	253	-	-	-	-	-	-	-	-
Total Facility	37.9	1330	154	60.6	5224	487.3	20.4	1096	125.3	35.7	842	142	11.35	264	39.86

GT1 = the first gas turbine and Heat Recovery Steam Generator (GT/HRSG).
GT-S = Start-up emissions from either GT/HRSG group.
GT-SD = Shutdown emissions from either GT/HRSG group.

Source: BAAQMD's Proposed Permit Conditions and January 19, 1999 letter to Docket No. 98-AFC-1

AIR QUALITY Table 3
Maximum Hourly, Daily, and Annual Fuel Consumption

	Hourly	Daily	Annual
	(MMBtu/hr)	(MMBtu/day)	(MMBtu/yr)
GT1	2012	48,288	25,600
GT2	2012	48,288	
Boiler	266	6,384	266
Total Facility		102,960	26,000

Source: BAAQMD's Proposed Permit Conditions

CONSTRUCTION INCREMENTAL IMPACTS

The applicant estimated the impacts of construction-related emissions using the ISC model. As with the estimation of construction emission levels, the estimation of actual impacts is highly speculative. **AIR QUALITY Table 4** provides a summary of the maximum estimated impacts, which are very conservative because of a potential overestimation of emission levels, the lack of consideration of rapid deposition of PM fugitive (dust) emissions, and potential overestimation of impacts from ground-level releases using the ISC model. It is important to note that these are temporary impacts that would only occur during the construction phase of the project. Also they do not reflect the implementation of construction related mitigation measures included in conditions proposed by Energy Commission staff to minimize emissions.

AIR QUALITY Table 4
Maximum Estimated Construction-Related Incremental Impacts

Pollutant	Averaging Time	Incremental Impacts ($\mu g/m^3$)	Maximum Background ($\mu g/m^3$)	Maximum Total Impacts ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Ratio to the Limiting Standard
NO_2	1-hour	322	142.9	464.9	470	0.99
	Annual	51	32.1	83.2	100	0.82
PM10	24-hour	719	87	806	50	16
	Annual	54	20.2	74	30	2.5
CO	1-hour	2322	6,857	9,179	23,000	0.4
	8-hour	1677	4,202	5879	10,000	0.59

Note: the hourly NO_2 impacts were revised assuming conservatively that 10 percent of the NO_x emissions is NO_2 and assuming a background ozone concentration of 90 μ/m^3. However, measurements in the Caldecott tunnel on state highway 24 in the San Francisco Bay Area suggest that approximately less than 1% of the NOx emissions from internal combustion engines is NO_2 (Kirchstetter, 1999). Therefore, actual maximum hourly incremental NO_2 impacts may be significantly lower than the value presented in this table. The maximum 1-hour NO2 background concentration correspond to the maximum 1-hour concentration measured in Pittsburg in 1995, 1996,and 1997.The annual impacts were estimated as 70 percent of the maximum NO_x impacts using EPA's annual ratio method.

Sources: Table 5.2-18B from AFC, ARB 1998a

In addition to the brief discussion regarding the conservative (over-predicting) nature of the construction impact modeling, we should add that the maximum fugitive dust PM10 emission levels and impacts would not occur during the winter time when the highest measured PM concentrations are historically measured in the San Francisco air basin. This is due to the fact that the ground tends to be wet because of the rains, and the relative humidity is high during this time of the year.

PROJECT COMMISSIONING IMPACTS

Carbon monoxide and NO_x emissions levels are expected to be substantially above permitted levels during the commissioning period which, as indicated above, should last for about two months. **AIR QUALITY Table 5** presents the worst case commissioning impacts.

AIR QUALITY Table 5
Estimated Air Quality Impacts During Commissioning

Pollutant	Averaging Time	Incremental Impact	Maximum Background ($\mu g/m^3$)	Maximum Total Impacts ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard (%)
CO	1-hour	2493	6,857	9349	23,000	41
CO	8-hour	238	4,000	4238	10,000	42
NO_2	1-hour	288*	142.9	430	470	92
* The modeling analysis assumes that all the NO_x emission is NO_2. Actual worst case NO_2 incremental impacts will be much lower than value presented in this table if we consider that only a fraction of the NO_x emissions is NO_2 (see note in **AIR QUALITY Table 4**)						

Source: Letter from Allan Thompson to Docket 98-AFC-1 dated January 21, 1999.

PROJECT NORMAL OPERATIONAL IMPACTS

The AFC, in Table 5-2-17, presents a conservative screening (over-predicting) analysis of fumigation conditions for both inversion break-up and shoreline fumigation. Inversion break-up fumigation may occur in the morning when the air close to the ground is heated by the sun and a strong mixing of air at different levels occurs similar to what happens in a pot of water at the beginning of the boiling process. In this case power plant plumes are rapidly mixed and can produce relatively high ground level impacts. Shoreline fumigation is similar to inversion break-up fumigation but only occurs in inland areas close to large bodies of water such as oceans and large lakes. The analysis done by the applicant assumes conservatively that the New York Slough is such a large body of water. The conservative analysis presented in AFC Table 5-2-17 indicates that the proposed project will not produce a violation of the CO, NO_2, or SO_2 standards.

The AFC presents a “refined” modeling analysis in Table 5.2-2S. We use the term “refined” modeling analysis (from now on we will call this the ISC analysis) because there are still embedded in the analysis conservative assumptions that were deemed necessary by the BAAQMD or by the limitations of the ISC model. We will elaborate about this point later in this analysis.

AIR QUALITY Table 6 presents a summary of the ISC modeling results for the proposed power plant.

We have duplicated some of the modeling runs performed by the applicant and have enhanced the analysis to better understand the PM10 impacts. From our modeling runs we conclude that the high PM10 impacts are due mainly to the assumed PM10 emissions from the cooling towers and from impacts on elevated terrain (above stack height). The cooling tower impacts are conservatively estimated assuming that all the dissolved solids in the water droplets leaving the cooling towers are immediately released as PM10. However, the size of the droplets leaving the cooling towers is much larger than 10 microns and they do not behave as a gas, as we have assumed in the modeling analysis (Hanna, 1994).

AIR QUALITY Table 6
ISC Modeling Results

Pollutant	Averaging Time	Incremental Impact ($\mu g/m^3$)	Maximum Background ($\mu g/m^3$)	Maximum Total Impacts ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard (%)
NO_2	1-hour	18	142.9	160.9	470	34
	1-hour*	119	188	307	470	65
	Annual	0.16	32.1	32.3	100	32
CO	1-hour	29	6,857	6,886	23,000	30
	1-hour*	1251	6,857	8,108	23,000	35
	8-hour	214	4,000	4,202	10,000	42
PM10	24-hour	2.87	87	90	50	180
	Annual	0.64	20.2	21	30	70
SO_2	1-hour	1.91	131	133	655	20
	3-hour	1.78	122**	124	1,300	10
	24-hour	0.33	31.3	32	105	30
	Annual	0.001	2.6	2.6	80	3

* Concentration estimated assuming one turbine at 100% load and the other under start-up conditions. Only one turbine will be allowed to be in a start-up mode as per proposed BAAQMD's permit conditions.
** Linear interpolation between 1-hour and 24-hour concentrations.
Note: For the CO 8-hour impacts, even if we use the 1-hour concentrations during start-up conditions, total impacts will be lower than the 1-hour standard.

Source: AFC Table 5.2-2S, ARB 1998a

The ISC, model estimates that the maximum PM10 impact from the cooling towers occurs about 30 meters northeast from the power plant when the wind will bring the plume to the ground. If this is the case, it is most likely that the droplets will be larger than 10 microns and therefore will not be PM10, which is defined as particles of less than 10 microns. In addition, during the winter, when the highest ambient PM concentrations are measured, the cold and high relative humidity in the ambient air may not allow the evaporation of the water in the droplets before they are deposited in the ground. Again, these droplets will most likely remain larger than 10 microns. With respect to the estimated impacts on elevated terrain we should indicate that they are conservative estimate of impact levels and not refined model estimates. The ISC model is only a refined model for the estimation of impacts at terrain elevations below stack height. In summary, the actual PM10 incremental impacts should be significantly lower than the numbers presented in **AIR QUALITY Table 6**.

Finally, the total impacts from **AIR QUALITY Table 6** are conservative because total impacts are calculated assuming that the worst case incremental impact from the proposed power plant will occur at the same time that the historical maximum background concentrations occur. For example, it is unlikely that the actual highest 1-hour average NO_2 impacts from the proposed power plant would occur exactly during the few hours and days in a given year when relatively high NO_2 ambient concentrations are measured (see **AIR QUALITY Figure 4** and **AIR QUALITY Figure 5**).

CUMULATIVE IMPACT ANALYSES

The Energy Commission staff was unable to finish the cumulative impact analysis for this project. Staff anticipates this analysis will be complete in time to include it in the supplementary testimony on April 12, 1999.

MITIGATION

APPLICANT'S PROPOSED MITIGATIONS

The applicant is proposing to mitigate potential air quality impacts using a state of the art combustion technology, installing post-combustion control devices, and providing offsets, as required by the BAAQMD's regulations.

The applicant is proposing to install a gas turbine equipped with Dry Low NO_x combustors that can achieve low NO_x concentrations without the need for steam or water injection. In addition, the GT/HRSG will be equipped with SCR and oxidizing catalysts for the control of NO_x and CO respectively. The auxiliary boiler will comply with the Best Available Control Technology (BACT) limitations determined by the BAAQMD and will not operate for more than 1,500 hours a year.

The applicant has submitted confidential information regarding the offsets that they plan to provide for this project. The applicant is still in negotiations with the sellers of the offsets. If the applicant is able to secure these offsets, they should be sufficient to satisfy its regulatory offset requirements. However, one potential problem is the fact that one of the sources of offsets is still going through the regulatory "banking" process of certifying the emission reductions that have occurred or will occur to obtain valid ERCs. The BAAQMD indicated at the Energy Commission staff workshop on February 11, 1998 that this process may take as long as two months and may not result in valid ERCs.

We are pleased with the diligence shown by the applicant in trying to obtain offsets as close as possible to the proposed site. The applicant provided information on all the activities carried out to secure offsets in its confidential information submittal on February 3, 1999. However, as indicated above, the information provided does not indicate that the applicant has yet been successful in its endeavor.

ADEQUACY OF PROPOSED MITIGATIONS

The BACT (state definition) levels, which are applicable to individual projects, are typically determined by the local air quality agencies with input from the Air Resources Board (ARB) and U.S. EPA. Recently in both the High Desert and Sutter Power Plant AFC cases, the EPA Region IX has clearly stated their position regarding what they consider to be BACT (federal definition) and Lowest Achievable Emission Rates (LAER). The state definition of BACT is equivalent to the federal LAER definition. EPA Region IX has indicated that BACT (federal definition) for CO is 4 ppm averaged over a 24-hour period. This seems to be more stringent than the 6 ppmv (3-hour average) determined by the BAAQMD as BACT for CO. However, the long averaging time used by EPA may result in a less stringent control

requirement. In addition, if the EPA determination is based on source test data (measurements taken at the stack during annual tests) it may not be applicable to enforcement of the limitation using continuous emission monitors (CEM). In our opinion, BACT determinations to be enforced with CEMs should also be based on CEM data (for example, with data of up to 8,760 hours in a year). With respect to CO, there are also problems with the apparent lack of performance of the oxidative catalysts sold by a major manufacturer of this type of equipment in at least two power plants in California, including one licensed by the Commission a few years ago. The power plant licensed by the Commission is restricting its operations to avoid violations of hourly CO emission limits and it is in the process of requesting a review of their CO condition of certification.

With respect to NO_x, the BAAQMD's proposed permit conditions, which they have not yet officially released for public review, require a level of control of 2.5 ppmv averaged over 3 hours. EPA believes that LAER is 2.5 ppmv averaged over 1 hour. For VOC, the BAAQMD is not proposing limitations in terms of concentrations, e.g. ppmv, but has limitations in terms of mass emissions (lb/hr, lb/day, and tons per year). Our calculations show that the mass limitation will be equivalent to approximately 3.8 ppmv while the EPA LAER determination is 1 ppmv. In our opinion, the 1-ppmv level is achievable with the installation of the oxidizing catalyst. The use of a 1-ppm limit for VOC will reduce the amount of VOC offsets required for this project.

ERCs are generated from reduction of emissions beyond what is required by existing rules and regulations or by required control measures included in the Air Quality Management Plans (AQMPs) for future adoption. Offsets, in the form of ERCs, are required for the PDEF for NO_x, VOC, and PM10 in order to assure future attainment of ozone and PM10 standards. ERCs are banked and can be used to offset the emission increases for future projects. In past siting cases some intervenors have argued that the ERCs are not actual mitigation since the emission reductions have already occurred and, therefore, ambient air quality can only deteriorate with the new source of emissions. However, the BAAQMD in its AQMP include banked ERCs in its planning inventories for future years as actual ongoing emissions (BAAQMD, 1997b). Therefore, the future effect of new sources due to emission increases are already taken into account in the AQMP and the use of ERCs as a source of mitigation or offsets is valid. The new source will not detract from the BAAQMD's attainment strategy. Therefore, we believe that banked offsets in this case constitute real mitigation of potential impacts from the proposed project.

We are aware that the applicant may propose to offset potential PM10 emissions increases from the proposed power plant using interpollutant offsets. In this case, NO_x ERCs would be used to mitigate some of the direct PM10 emissions. The BAAQMD will require a 6 to 1 offset ratio on an annual basis, i.e. 6 tons/year NO_x ERCs are needed to offset 1 ton/year of directly emitted PM10. Although we agree with the BAAQMD, as indicated in a past analysis for the Shell Small Power Plant Exemption Application which was located in the same general area, we consider that a 2 to 1 ratio on a daily basis is adequate to mitigate potential peak daily emissions (CEC, 1993). This is based on the estimation that approximately half of

the NO_x emissions may end-up as ammonium nitrate (a PM10 constituent) after 24 hours of its release into the atmosphere during the winter time. As indicated above, the highest PM10 concentrations are measured in the winter when the atmospheric conditions (low temperatures and high relative humidities) are conducive for ammonium nitrate formation. In addition, PM10 buildup in the atmosphere occurs during several days and it is only interrupted by the presence of rain which cleans the atmosphere (Watson, 1998). Therefore, the final conversion of NO_x to ammonium nitrate after a few days could be even higher than 50 percent. Since one pound of NO_x produces two pounds of ammonium nitrate a 1 to 1 mitigation ratio, which is equivalent to only assuming a 50 percent conversion, has been recommended by ARB and used in other siting cases before the Energy Commission. The 2 to 1 ratio recommended for this project is more stringent and equivalent to assuming conservatively a lower conversion of NO_x to PM10 nitrate.

STAFF PROPOSED MITIGATIONS

CONSTRUCTION

Historically, Energy Commission staff propose conditions of certification for the construction phase of new power plants. This is done to ameliorate the unavoidable and temporary impacts mainly from fugitive dust releases due to soil disturbance caused by construction related activities. As discussed in the **Public Health** section of this document, some soil at the proposed PDEF site is contaminated with low levels of arsenic which constitute a potential public health impact. For this reason we propose, as mitigation, conditions of certification implementing the Best Available Control Measures available to reduce fugitive dust emissions. Our proposed permit conditions follow the guidance provided in Rule 403 (Fugitive Dust) Implementation Handbook, published by the South Coast Air Quality Management District. These measures include, among other things, the application of water to limit the suspension of dust in the air, the application of chemical stabilizers when appropriate, planting of vegetation as soon as practical on open exposed areas, and covering truck loads of soil.

Researchers from the California Institute of Technology estimate that the application of the measures included in Rule 403 Implementation Handbook results in a reduction of construction and demolition dust of approximately 70 percent (Kleeman, 1999). If this is the case, the application of the proposed construction related permit conditions of certification should substantially mitigate air quality impacts during the construction phase of the project.

COMMISSIONING AND OPERATION

The BAAQMD's proposed permit conditions for the commissioning period contain provisions to limit emissions. For example, the BAAQMD requires the following: a) installation of the catalysts at the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers; b) submission of a plan describing the operations to be carried out during commissioning; c) real time monitoring of CO and NO_x emissions; d) limiting the number of firing hours without SCR and/or oxidation catalyst; e) counting the emissions during the commissioning period toward the maximum annual emission limits for the facility; f) establishing

daily limits for all pollutants; g) establishing hourly limits for CO and NO_x; and h) requiring a source test to measure actual NO_x, CO, and VOC emissions during start-up and shutdown conditions for the gas turbines. We believe that these conditions, in general, are sufficient.

The BAAQMD's proposed permit conditions for normal or commercial operation are also complete and reasonable. However, we believe that some adjustments to the permit conditions are in order to assure that we are more protective of the environment and public health. We expect that the BAAQMD will incorporate our comments in its final permit conditions. However, if this is not the case we will propose supplementary Energy Commission's conditions of certification. The following are the proposed changes to the permit conditions and the reasoning behind them:

a) Reduction of the maximum daily emission limits.

The daily emission limits included in the BAAQMD's proposed permit conditions are very conservative (too high). This conservatism is due in part to the assumptions made regarding emissions during start-up and shut down conditions and the lack of consideration that during most hours of operation the concentration of NO_x emissions will be below permitted levels. This later point is partially supported by the source test data provided in **AIR QUALITY Table 7**.

AIR QUALITY Figure 7 presents further evidence that the proposed daily emissions included in BAAQMD's permit conditions may be too high. This figure presents approximately one and a half year of recent CEM data collected at the Crockett Cogeneration power plant. This figure shows that actual daily emissions are well bellow the estimated maximum daily emissions used in the analysis for the project during licensing. This effect is even more pronounced if we compare the historical emissions from all the units in the facility (two auxiliary boilers and the cogeneration power plant) with the daily facility-wide emissions.

The same conclusions can be reached with respect to the other pollutants. For example, VOC measurements during source tests conducted at multiple power plants in California indicate that emissions are usually below detectable levels (see **AIR QUALITY Table 7**). In some cases, source test firms measure total hydrocarbons instead of VOC (VOC is total hydrocarbons minus methane, ethane, and other less reactive constituents) because concentrations are so low that even assuming that the VOC is equal to the measured total hydrocarbons, this measurement will be below permitted levels. In the case of PM emissions, measurements in power plants in California suggest that PM emissions should be much lower than the 17 pounds per hour used in the estimation of PM10 emissions for this project. In this case, we understand the applicant's desire to use maximum hourly "guarantied" levels, which by their nature are very conservative. We still believe, however, that the use of a daily limit instead of an hourly limit, in this case, should address the applicant's concerns.

AIR QUALITY Table 7
Source Test Data for a Limited Set of California Power Plants

Facility	Source Test Data			Permitted level		
	NO_x (ppmv) (lb/hr)	VOC (lb/hr)	PM lb/hr)	NO_x (ppmv) (lb/hr)	VOC (lb/hr)	PM (lb/hr)
Sacramento Power Authority (Campbell)	2.47 12.28	<1.42	1.93	3.0 15.82	9.01	3.0
Crockett Cogeneration	3.27* 26.91	<0.21	2.82	5.0 38.9	12.6	10.8
Carson Energy Group** (combined cycle unit)	3.96 6.96	<0.53	NA	5.0 9.28	3.75	3.5
City of Redding	6.1 2.75	<0.75	5.05			
Sycamore Cogeneration	10	<0.001***	4.01			

* Ammonia slip at less than 1 ppmv

** Burning digester and natural gas

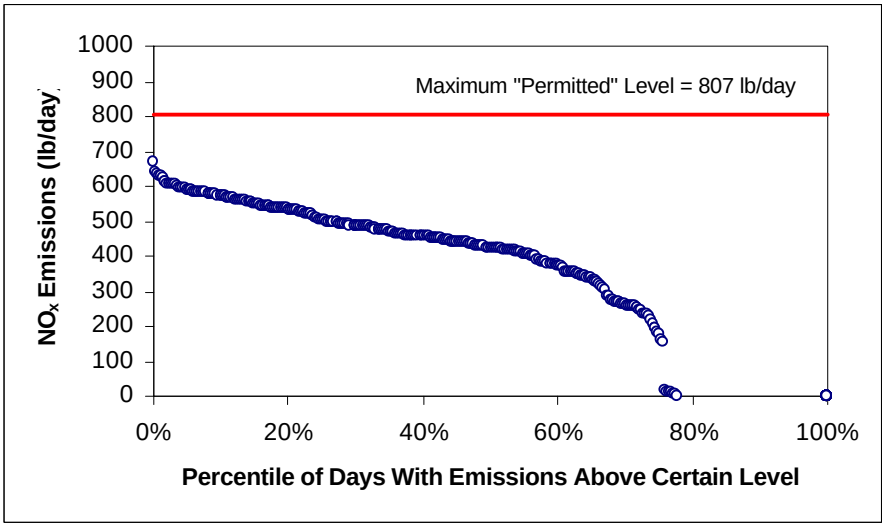
*** Measurement was below detection limit. However, the reported detection limit of 0.001 lb/hr seems to be in error. This number may represent the detection limit in ppmv as CH_4.

In general the numbers reported represent the maximum average concentrations in cases when multiple tests were performed at different loads. In this case, the concentrations (ppmv) and emissions (lb/hr) may occur at different operating conditions. This table only presents the results of the electricity generating units not including auxiliary boilers and other ancillary units.

Source: source test reports submitted to the Energy Commission.

As shown in **AIR QUALITY Table 8**, the Energy Commission's proposed daily limits are still safely above the expected real-world maximum emission, which should give confidence to the applicant that they will not impose an unreasonable restriction on the operation of the power plant. These limits should be revised based on any changes made by the BAAQMD in its final BACT determinations.

AIR QUALITY Figure 7
Daily NOx Emission Percentile Distribution for the Crockett Cogeneration Power Plant: 1997-98



The Crockett Plant is composed of a cogeneration plant and three auxiliary boilers. The cogeneration plant does not have a permitted level by itself. We estimated the "permitted" emission levels subtracting the maximum hypothetical daily emissions from the auxiliary boilers from a facility-wide emission limit of 969.7 lb/day. When the cogeneration power plant is in operation, the cogeneration plant satisfies most of the steam demand. Therefore, the effective maximum daily NO_x limit for the gas turbine is between 807 lb/day and 969.7 lb/day.
Source: Compliance data submitted to the California Energy Commission.

AIR QUALITY Table 8
Proposed Maximum Daily Emission Limits

Pollutant	District Proposed Permit Daily Limits (lb/day)	Energy Commission Proposed Daily Limits (lb/day)	Estimated Real-World Maximum Emissions (lb/day)
NO_x	1330	1,109	<960*
CO	5224		
VOC	1096	907	<< 600**
PM10	842	780	<< 780***
SO_x	266.8		

* We assume 100 lb/hr per start-up and 10 lb/hr per shutdown. They are slightly higher than the maximum emissions measured in Crockett. The average start-up emission was about 50 lb/hour and the maximum total emission per start-up was 127 lb. We assume normal operation at 2.25 ppmv, because it is known that, in practice, power plants operate below their permitted levels to avoid a potential violation of permit conditions. It has been argued that multiple start-ups in a day may consume most of the daily NO_x limit. However, the evidence from Crockett indicates that after the first start-up, subsequent start-up emissions go down considerably (to approximately 15 lb/hour) because the warm catalysts are able to control emissions rather quickly.
** We assume 1 lb/hour per start-up and shutdown. Measurements at Crockett indicate that most of the organic emissions are methane, which is not a VOC. Most of the emission, as expected, is unburned fuel (methane is the main constituent of natural gas).
*** 780 lb/day correspond to approximately 16 lb/hr from the gas turbines, while source test data from similar power plants in California suggest much lower emission rates.

b) Reduction of the maximum annual SO_x emission limits and establishment of reasonable quarterly emission limits.

The applicant estimated SO_x emissions assuming a maximum sulfur content of the fuel of 1 grains/100 dscf. This is equivalent approximately to 16 ppmv of sulfur in the fuel. The applicant indicates that the actual expected concentration would be around 0.25 grains/100 dscsf. Similar value (4 ppmv of sulfur in the fuel) is being proposed by Delta Energy Center to estimate maximum SO_x emissions. We propose to establish an annual emission permitted level assuming a sulfur content of the fuel equal to 0.25 grains/100 dscf. In addition, we propose to establish a more reasonable quarterly emission limit assuming a sulfur content of 0.35 grains/100 dscf. Both emission limitations would be enforced with required weekly testing of the fuel (natural gas) to make sure that the quarterly and annual emission levels are not exceeded. The applicant would have the option to provide SO_x ERCs if it believes that it needs more operational flexibility.

The reason for these proposed requirements are to ensure that SO_x emissions will remain low since there is not a requirement to provide regulatory offsets for SO_x. This pollutant is a PM10 precursor, and as done in two recent siting cases (San Francisco and Sutter) the Commission did not propose requiring additional mitigation due to the expected low SO_x emission levels. In addition, as mentioned before, we believe that the PM10 direct emissions from the proposed project are overstated and, therefore, PM offsets provided for this project (123.55 tons/year) would most likely cover any potential increase in SO_x emission using more reasonable assumptions regarding the sulfur content of natural gas.

c) Revision of maximum start-up and shutdown emissions based on source test results and actual 1-year operational data.

Estimation of NO_x, CO, and VOC emissions during start-up and shutdown conditions vary widely. However, as far as we know, the source tests conducted in the Crockett cogeneration plant provide the only real world measurements in a combined cycle power plant with the added effect of an SCR and an oxidizing catalyst (Crockett 1996)(Crockett 1997). The combined effect is important because the SCR and the oxidizing catalyst may be effective in limiting total start-up and shutdown emissions. Traditionally air agencies do not regulate emissions during start-ups and shutdowns, with the BAAQMD being the exception, and for this reason there is a lack of actual source data documenting such emissions. For the same reason manufacturers and operators of power plants have not designed schemes to reduce emissions during these transient conditions.

Our understanding is that the applicant is uneasy accepting more restrictive start-up and shutdown emission limits because of a lack of experience on limitations of this nature. At the same time, however, we would like to limit emissions to the extent that is practical and reasonable. The thrust of this proposal is the protection of ambient air quality. Even though the applicant's and our analyses show that there will not be a violation of the ambient air quality standards, the level of the incremental impacts are not trivial. We believe that the best way to proceed is to accept the permit limits proposed by the BAAQMD but at the same time allow for a

revision of these limitations after one year of operation. After one year of operation, the BAAQMD, the applicant, and Energy Commission staff will have actual operational data to establish, with a reasonable margin of safety, more realistic emission limits for start-up and shutdown conditions. These revised limits will be based on source test data and CEM data collected during start-up and shutdown conditions.

COMPLIANCE WITH LORS

FEDERAL

The U.S. EPA has delegated its Prevention of Significant Deterioration (PSD) and Non-attainment New Source Review (NSR) requirements to the BAAQMD. This delegation is only done for air districts that are able to demonstrate to the satisfaction of U.S. EPA that their regulatory programs are at least as stringent as the federal PSD and Non-attainment NSR programs. The BAAQMD will issue an Authority to Construct only after this project secures a license from the California Energy Commission. This permit will be the equivalent to a federal PSD and federal Non-attainment NSR permits. In addition, the U.S. EPA has also delegated to the BAAQMD the authority to implement the federal Clean Air Act Title V permitting program. This operating permit is issued only after a facility is in operation and it would be the same as the BAAQMD's Permit to Operate. Therefore, compliance with the BAAQMD's rules and regulations will most likely result in compliance with federal requirements.

STATE

The project, assuming full compliance with the BAAQMD's rules and regulations, should comply with Section 41700 of the California State Health and Safety Code.

LOCAL

The regulatory offsets for this project have not been secured. Part of the offsets that the applicant would like to use has not been banked yet. Since these offsets have not been banked, they do not constitute valid ERCs. For this reason, the project does not comply with the offset requirements of Sections 2-2-302 and 2-2-303 of Rule 2, Regulation 2.

By the time of the preparation of this analysis, the BAAQMD has not submitted its Preliminary Determination of Compliance (DOC). Therefore, a finding of compliance with other BAAQMD's rules and regulations cannot be made at this time. BAAQMD intends to issue the Preliminary DOC by mid March, 1999. This document will be open for a 30-day public review period before the BAAQMD prepares its final DOC.

CONCLUSIONS AND RECOMMENDATIONS

Based on the information presented in this analysis, we cannot recommend approval of the proposed project at this time. The following must be done before we can recommend approval of the project:

a) The BAAQMD must issue the Final Determination of Compliance.
b) The applicant must provide a valid offset package which must be approved by the BAAQMD.
c) The Energy Commission should adopt supplemental conditions of certification in addition to the BAAQMD's permit conditions, if needed, to address the concerns raised in the Staff Proposed Mitigations section of this analysis.

PROPOSED CONDITIONS OF CERTIFICATION

We only propose conditions of certification for construction related operations, at this time, in the absence of a Preliminary Determination of Compliance.

Additional California Energy Commission Permit Conditions Applicable to Construction Activities: These conditions are not included in the District's Permit to Construct.

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

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

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

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

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

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

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

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

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

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

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

AQ-1 The project owner shall implement a CEC CPM approved fugitive Dust Control Plan.

The plan shall include the following:

1. A description of each of the active operation(s) which may result in the generation of fugitive dust;

2. an identification of all sources of fugitive dust (e.g., earth-moving, storage piles, vehicular traffic, etc.

3. A description of the Best Available Fugitive Dust Control Measures (see Table 1 attached) to be applied to each of the sources of dust emissions identified above (including those required in AQ-2 below). The description must be sufficiently detailed to demonstrate that the applicable best available control measure(s) will be utilized and/or installed during all periods of active operations;

4. In the event that there are special technical (e.g., non-economic) circumstances, including safety, which prevent the use of at least one of the required control measures for any of the sources identified, a justification statement must be provided to explain the

reason(s) why the required control measures cannot be implemented.

Verification: Not later than sixty (60) days prior to the commencement of construction, the project owner shall submit the plan to the CEC CPM for review and approval. The project owner shall maintain daily records to document the specific actions taken pursuant to the plan. A summary of the monthly activities shall be submitted to the CPM via the Monthly Compliance Report.

AQ-2 During the construction phase of the project, the project owner shall:

1. Prevent or remove within one hour the track-out of bulk material onto public paved roadways as a result of their operations, or take at least one of the actions listed in Table 2 (attached) to prevent the track-out of bulk material onto public paved roadways as a result of their operations and remove such material at anytime track-out extends for a cumulative distance of greater than 50 feet on to any paved public road during active operations;
2. Install and use a track-out control device to prevent the track-out of bulk material from areas containing soils requiring corrective action (as currently identified in drawing no. 5-1 of the addendum dated February 12, 1999 to the Corrective Measures Study performed by the Mark Group for USS-POSCO Industries) to other areas within the project construction site and laydown area;
3. Minimize fugitive particulate emissions from vehicular traffic on paved roads and paved parking lots on the construction site by vacuum mechanical sweeping or water flushing of the road surface to remove buildup of loose material. The project owner shall inspect on a daily basis the conditions of the paved roads and parking lots to determine the need for mechanical sweeping or water flushing.

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

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

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

AQ-4 Upon completion of construction, the project owner will ensure that all areas within the largest extent of the final footprint (as identified in drawing no. 5-1 of the addendum dated February 12, 1999 to the Corrective Measures Study

performed by the Mark Group for USS-POSCO Industries) containing soil that exceed the approved arsenic background concentration of 24 mg/kg are capped with a minimum 1-foot thickness of one or more of the following: soil, gravel, asphalt or concrete paving, or buildings.

Verification: As part of the fugitive dust control plan required in AQ-1, the project owner will specify measures that will be taken to comply with AQ-4, or indicate that capping is not required based on revised regulatory levels approved by DTSC. The plan will include the areas subject to capping and methods used.

TABLE 1
BEST AVAILABLE FUGITIVE DUST CONTROL MEASURES

FUGITIVE DUST SOURCE CATEGORY	**CONTROL ACTIONS**
Earth-moving (except construction cutting and filling areas, and mining operations)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR
	For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas:	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the CEC CPM, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.

TABLE 1 (Continued)

FUGITIVE DUST SOURCE CATEGORY	**CONTROL ACTIONS**
Earth-moving: Construction cut areas and mining operations:	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	Apply chemical stabilizers within five working days of grading completion; OR
	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.

TABLE 1 (Continued)

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

TABLE 2
TRACK-OUT CONTROL OPTIONS

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

TABLE 3
CONTROL MEASURES FOR WIND CONDITIONS EXCEEDING 25 MPH

FUGITIVE DUST SOURCE CATEGORY	**CONTROL MEASURES**
Earth-moving	Cease all active operations; OR
	Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR
	Apply chemical stabilizers prior to wind event; OR
	Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR
	Take the actions specified in Table 1, Item (3c); OR
	Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	Apply chemical stabilizers prior to wind event; OR
	Apply water twice [once] per hour during active operation; OR
	Stop all vehicular traffic.
Open storage piles	Apply water twice [once] per hour; OR
	Install temporary coverings.
Paved road track-out	Cover all haul vehicles; OR
	Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

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PUBLIC HEALTH

Testimony of Michael Ringer

INTRODUCTION

Normal operation of the proposed PDEF facility will result in the routine release of potentially harmful substances to the environment. The purpose of staff's public health analysis is to determine if such routine emissions of toxic contaminants will have the potential to cause significant adverse public health impacts or to violate standards for public health protection. If staff identifies potential significant health impacts, we will propose mitigation measures that may be used to reduce such impacts to insignificant levels.

Staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section. We examine potential impacts on public and worker health from accidental releases of hazardous materials in the **Hazardous Materials Management** and **Industrial Safety and Fire Protection** sections, respectively. Health effects from electromagnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project via wastewater streams to surface water bodies or the public sewer system are examined in the **Soils and Water Resources** section. Plant releases in the form of hazardous and nonhazardous wastes are described in the **Waste Management** section.

COMMISSION STAFF METHOD OF ANALYSIS

Public health staff is concerned about toxic emissions to which the public could be exposed during project construction and routine operation. Following the release of toxic contaminants into the air or water, people could come into contact with them through inhalation, dermal contact, or ingestion via contaminated food or water.

Toxic air contaminants are called noncriteria pollutants because no ambient (outdoor) air quality standards have been set for them. Ambient standards are outdoor air pollution levels that are considered safe for everyone. Since noncriteria pollutants do not have set standards, staff uses a process known as health risk assessment to make sure that people will not be exposed to them at unhealthy levels. The risk assessment procedure consists of the following steps:

4. Identify hazardous substances that the PDEF project could emit to the environment and their emission rates;

5. Estimate ambient concentrations of project emissions using dispersion modeling (how the substance travels in the atmosphere);

6. Estimate exposure levels to affected populations through applicable exposure routes such as inhalation, ingestion, and dermal contact; and

7. Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Initially, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, a simplified assessment is designed that will not underestimate 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 that are estimated by the assessment. This is accomplished by examining those conditions that would lead to the highest, or worst-case, risks and then using those in the study. Such conditions include:

- Using the highest expected level of pollutants emitted from the plant;
- Assuming weather conditions which would result in the highest ambient concentration of pollutants;
- Using the type of air quality computer model which results in the highest impacts
- Calculating health risks to a person at the location where the pollutant concentrations are calculated to be the highest;
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
- Assuming that an individual's exposure to cancer causing agents occurs for 70 years.

If a proposed project passes the initial screening analysis, staff will conclude that the project does not pose a significant health risk to the exposed population. Failure to pass the initial screening analysis does not automatically indicate that the project would pose a significant risk to public health, but that a more detailed assessment, using more realistic project-specific assumptions, is necessary to more accurately determine potential public health risks.

The process described above 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 (1-hour) exposure to relatively high concentrations of pollutants. Such effects include irritation of the eyes, skin, and respiratory tract. Chronic health effects, such as emphysema or heart disease, may result from long-term exposure to lower concentrations of pollutants.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels (called "reference exposure levels") found in the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spot" Program Risk Assessment Guidelines (see CAPCOA, p. III-36). Reference exposure levels are amounts of toxic substances, to which people can be exposed,

and suffer no adverse health effects. 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. 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.

If someone is exposed to multiple toxic substances, an adverse health effect could result, even if each individual substance is not present at harmful levels. Therefore, the assumption is made that the effects of each substance are additive. In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact (CAPCOA, p. III-37).

For carcinogenic substances, the health assessment considers the risk of developing cancer during exposure over a 70-year lifetime. Cancer risk is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called potency factors, these are published in the CAPCOA Guidelines), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be lower or even considerably lower than those estimated.

SIGNIFICANCE CRITERIA

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 the location where the highest emission levels were calculated using worst-case assumptions, as described above.

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. Significance of project-related health impacts is determined separately for each of the three categories.

Acute and Chronic Noncancer Health Effects

Staff assesses the significance of non-cancer health effects by calculating a “hazard index”. A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one signifies that the worst-case exposure is below the safe level. The hazard indices for all project-related

toxic substances are added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels. Under these conditions, health protection is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant non-cancer project-related public health impacts.

CANCER RISK

Staff presumes that a project-related lifetime cancer risk of less than one chance in one million ($1x10^{-6}$) is not significant for purposes of requiring additional health-related mitigation measures. Staff believes that this level constitutes a de minimis risk, or one that is so small as to be effectively "no risk". The Federal Food and Drug Administration made such a finding in the context of cancer risks from food additives (FDA 1985, p. 51557). They emphasized that the risk level did not mean that one in every one million people would contract cancer, but that the level represented an additional one in one million chance over a person's normal risk of developing cancer in his or her lifetime. The agency noted that "as far as can be determined, in all probability no one will contract cancer" (Id.). A survey of 132 regulatory decisions found that, with the exception of one decision, no action was taken to reduce risks below one in a million (Travis et al., 1987).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The following state and local LORS generally apply to the protection of public health. These provisions have established the basis for Energy Commission staff's determination regarding the significance and acceptability of project-related impacts on public health.

STATE

- California Health and Safety Code §§ 39650 et seq. mandate the Air Resources Board and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.

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

LOCAL

Bay Area Air Quality Management District Rule 2-1-316 requires a risk assessment or risk screening analysis to be performed for new or modified facilities that emit one or more toxic air contaminants that exceed specified amounts.

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. An emissions plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. As a result, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influence the surrounding population distribution and density which, in turn, affects public exposure to project emissions. Additional factors affecting potential impacts to public health include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The topography at the PDEF site is flat, with an elevation ranging from 9-12 feet above sea level. Approximately two miles southwest of the site, the Los Medanos Hills of the Diablo Range reach elevations of almost 1260 feet. New York Slough and Browns Island are immediately north of the site. The project site is surrounded to the north, south, and east by general industrial land uses and vacant open land. Within a one-mile radius, almost all of the vacant land is designated for industrial use, and most is owned by USS-POSCO. For more detailed information, please refer to the **LAND USE** section.

As mentioned above, the location of sensitive receptors near the proposed site is an important factor in considering potential public health impacts. The nearest residential areas are homes on Harbor and East 8th Streets to the southwest and Columbia Street to the south of East Santa Fe Avenue, approximately 1,300 and 2,000 feet, respectively, from the southern boundary of the power plant site. Application for Certification (AFC) Figure 5.9-4 depicts the location of residences within one mile of the site. Other sensitive receptors near the proposed site, including schools, day care facilities, convalescent homes, and hospitals, are shown on AFC Figures 5.9-4 (within a one mile radius) and 5.16-2 (within a six mile radius), as well as on AFC Table 5.16-4.

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 climate in the San Francisco Bay Area is dominated by the influence of the Pacific Ocean and the Pacific high pressure system, which is a semi-permanent, subtropical high-pressure system located off the coast. The size and strength of the Pacific high pressure system is at a maximum during the summer, which results in solar heating over California's interior, forming a thermal trough of low pressure which intensifies the prevailing northwesterly flow over the area. The Pacific high's influence weakens during the fall and winter so that sky cover, temperature, and humidity are more variable, as is air movement, with stagnant conditions occurring more frequently than during the summer.

Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. The predominant stability class for the area is neutral. Mixing heights (the height above ground level through which the air is well mixed and in which pollutants can be dispersed) are lower during the more stable mornings due to temperature inversions and increase during the warmer afternoons. Staff's **Air Quality** section presents detailed data which describes the meteorology of the area.

EXISTING AIR QUALITY

The proposed site is within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which includes Contra Costa County as well as eight other Bay Area counties. BAAQMD conducts ambient monitoring of thirteen gaseous toxic air contaminants at 17 locations throughout the district (collecting data for toxics at the Pittsburg monitoring station was suspended in 1993). By combining average toxic concentration levels from all 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. In 1996 the calculated cancer risk was 212 in one million (BAAQMD 1997, p. 11). Two of the monitored pollutants, benzene and 1,3-butadiene, together account for over one-half of the total risk, and are emitted primarily from mobile sources. Because of the use of reformulated gasoline beginning in the second quarter of 1996, as well as other toxics reduction measures, ambient levels of these two pollutants have been decreasing, leading to a reduction in overall risk during the past few years. For example, the risk was 342 in one million based on 1992 data, 315 in one million based on 1994 data, and 303 in one million based on 1995 data.

As noted above, toxics data is no longer collected at the Pittsburg monitoring station, so site specific data is not available. The closest stations collecting data are in Concord and Antioch. Based on comparisons of selected toxic compounds which are significant contributors to total risk from ambient air, it appears that the Antioch area may have slightly higher overall risk from inhalation, while the risk in Concord may be slightly lower.

As part of implementing the Air Toxics "Hot Spots" Information and Assessment Act of 1987, BAAQMD examines toxic emissions from facilities having operating permits. Certain facilities, based on the amount of pollutants emitted and the proximity of people who may live or work nearby, undergo further analysis by

means of a comprehensive health risk assessment. Based on such a health risk assessment, the Dow Chemical Company in Pittsburg was calculated to have a maximum lifetime cancer risk of 14 in one million. Because of the conservative nature of the health risk assessment, the actual risk from the facility is likely to be lower.

SITE CONTAMINATION

Significant site disturbances may occur during facility construction as a result of 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.

In order to determine whether there is any on-site contamination, ENRON commissioned a Phase I Environmental Site Assessment (ESA) in accordance with American Society for Testing and Materials practice E 1527 (W-C 1998b). As discussed further in the **Construction Impact** section below and the **Waste Management** section, some areas of shallow soils contain arsenic levels which exceed regulatory approved background levels. In addition, the Phase I ESA includes a report by Environmental Data Resources, Inc. (EDR) that examined potential contamination in an area encompassing about one mile around the proposed site. The EDR report located three locations near linear facilities which could contain some degree of contamination (please see the **Waste Management** section for more details).

IMPACTS

PROJECT SPECIFIC IMPACTS

Potential risks to public health may occur both during project construction and operation.

CONSTRUCTION IMPACTS

Potential risks to public health during construction may be associated with toxic substances disturbed during site preparation and remediation as well as from heavy equipment operation. Potential impacts from emissions of criteria pollutants from the operation of heavy equipment and particulate matter from earth moving are examined in staff's **Air Quality** analysis.

As noted above, areas of soils containing arsenic above the background level of 24 mg/kg (approved by the San Francisco Bay Regional Water Quality Control Board) were reported in the Phase I ESA. These areas with arsenic levels in excess of background are located in former biofarm plots which had been used to treat soil and sludges containing petroleum hydrocarbons. The biofarm areas had been closed with all bioremediated soil excavated and replaced with fill material. Phase II confirmation sampling of the fill showed that sixteen composite soil samples exceeded the arsenic background level (Mark Group 1998, p. 15). The result is that

approximately eight acres contain soil which could pose a health hazard due to arsenic contaminated soil that could be contained in airborne dust. Seven of the acres are located either within the PDEF main plant site, pipe easement areas, or the construction laydown area (Mark Group 1998, drawing 5-1). Proposed mitigation is discussed in the **Mitigation** section.

Other than arsenic in the soil, the Phase I report concluded that there is a very low potential for a "recognized environmental condition" to exist on the site. As noted on page 2 of the Phase I ESA, a "recognized environmental condition" refers to the presence or likely presence of any hazardous substance on a property under conditions that indicate an existing, past, or material threat of a release to the ground, groundwater, or surface water of the property.

Contaminated soil may also be encountered during excavation for linear facilities. As noted above, the EDR report identified locations near project linear facilities that could have potential contamination, although no specific problems were noted.

OPERATION IMPACTS

The PDEF project may be constructed with one of two configurations, each consisting of two natural gas fired turbines, a cooling tower, and an auxiliary boiler. The type and quantity of contaminants from operation would be the same from the two designs, since the emission sources are identical. During operation of either configuration, potential public health risks are related to natural gas combustion emissions from the gas turbines and auxiliary boiler, and noncombustion emissions from the cooling tower.

As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted. **PUBLIC HEALTH Table 1** lists toxic substances emitted from natural gas-fired combustion turbines and boilers taken from the California Toxic Emissions Factors (CATEF) database, and also contains reference exposure levels (used to calculate short-term and long-term noncancer health effects) and cancer unit risks (used to calculate the lifetime risk of developing cancer) published in the CAPCOA Guidelines. A numerical listing for a toxic substance under one of the columns indicates that the substance has been included in the risk analysis for that category. For example, since benzene has no acute REL listing, there are no short-term health considerations for it. Acrolein, however, does have short-term health implications, since there is a REL listed for it.

Noncriteria emissions from the cooling tower originate from contaminants in the cooling source water, which become entrained in liquid water droplets emitted as cooling tower drift. The PDEF project will use high efficiency drift eliminators, which limit the amount of drift loss to approximately 0.00023 percent of the circulating water rate, resulting in a drift rate estimated to be about 0.3 gallons per minute (PDEF 1998d, AFC Appendix I.E). The amount of water lost as liquid (drift) from the cooling towers is in sharp contrast to the amount of water lost as steam from the cooling towers, which is estimated to be about 1440 gallons per minute on an annual average basis (PDEF 1998d, AFC Table 3.4.5-1). Water emitted from the cooling towers as steam is distilled, and would not contain any contaminants.

PUBLIC HEALTH Table 1
Noncancer Reference Exposure Levels (REL) and Cancer Unit Risks for Natural Gas-Fired Combustion Turbine and Boiler Emissions

Substance Emitted	Acute REL $\mu g/m^3$	Chronic REL $\mu g/m^3$	Cancer Unit Risk $(\mu g/m^3)^{-1}$
Acetaldehyde		9.0E+00	2.7E-06
Acrolein	2.5E+00	2.0E-02	
Ammonia	2.1E+03	1.0E+02	
Benzene		7.1E+01	2.9E-05
1,3-Butadiene			1.7E-04
Formaldehyde	3.7E+02	3.6E+00	6.0E-06
Napthalene		1.4E+01	
PAHs			1.7E-03
Propylene oxide	1.0E+03	3.0E+01	3.7E-06
Toluene		2.0E+02	
Xylene	4.4E+03	3.0E+02	

Source: AFC Supplement Tables 5.16-3a,3b,and 3c using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993 and California Toxic Emissions Factors (CATEF) database (4/96)

PDEF will use tertiary treated wastewater from the Delta Diablo Wastewater Treatment Facility for cooling water (however, if the supply of reclaimed water is interrupted, potable water will be used). **PUBLIC HEALTH Table 2** lists potentially toxic substances which may occur in the treated wastewater along with their cancer potency values and noncancer reference exposure levels as published in the CAPCOA guidelines, and which could be emitted from the cooling tower as part of the drift.

In addition to the substances identified in **PUBLIC HEALTH Table 2**, wastewater contains various levels of pathogenic organisms, such as viruses and bacteria. If the wastewater is not treated to reduce the numbers of these organisms, they could be entrained in the cooling tower drift at levels that could affect public health. The California Department of Health Services (DHS) is currently promulgating regulations requiring that recycled water used in systems with cooling towers be disinfected tertiary recycled water. The regulations also list criteria that specify the degree of disinfection required as well as the final allowable concentrations of pathogens (e.g., 99.999 percent reduction of virus). In a background paper on the development of standards using reclaimed water in cooling towers, DHS describes the level of viruses allowed to be "lower than the detection limit of one virus unit per 100 liters" (DHS 1992, p. 5).

PUBLIC HEALTH Table 2
Noncancer Reference Exposure Levels (REL) and Cancer Unit Risks for Cooling Tower Emissions

Substance Emitted	Acute REL $\mu g/m^3$	Chronic REL $\mu g/m^3$	Cancer Unit Risk $(\mu g/m^3)^{-1}$
Arsenic		5.1E-01	3.3E-03
Beryllium		4.8E-03	2.4E-03
Cadmium		3.5E+00	4.2E-03
Hex Chromium		2.0E-03	1.4E-01
Copper	1.0E+01	2.4E+00	
Lead		1.5E+00	8.0E-05
Manganese		4.0-01	
Mercury	3.0E+01		
Selenium	2.0E+00	5.0E-01	1.4E-04
Silica		1.2E+00	2.9E-04
Sodium Hydroxide	2.0E+01	4.8E+00	
Sulfate	2.5E+01	2.5E+01	
Zinc		3.5E+01	

Source: AFC Supplement Tables 5.16-1b and 5.16-3a,3b,and 3c using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993

Once potential emissions are identified, the next step is to quantify them by conducting a "worst case" analysis. Annual emissions are required to calculate cancer and chronic (long-term) noncancer health effects. The applicant calculated annual emissions assuming operation of two turbines simultaneously at maximum fuel input for 8080 hours per year. Boiler emissions were estimated using maximum fuel input rates for 1500 hours per year, and the cooling tower was assumed to operate continuously at maximum flowrates. AFC Supplement Tables 5.16-2a, 2b, and 2c present annual emissions of each toxic air contaminant from the turbines, boiler, and cooling tower, respectively.

Hourly emissions are required to calculate acute (short-term) noncancer health effects. Maximum hourly emissions were calculated assuming simultaneous operation of both turbines, the boiler, and the cooling tower at maximum emission rates. AFC Supplement Tables 5.16-2a, 2b, and 2c present maximum hourly emissions of each toxic air contaminant from the turbines, boiler, and cooling tower, respectively.

The next steps in the health risk assessment process are to estimate the ambient concentrations of those substances, the degree to which people might be exposed to them (exposure levels), and the potential health effects of the exposure. The applicant used the U.S. Environmental Protection Agency approved ISCST3 dispersion modeling program to estimate ambient toxic concentrations (please refer to staff's **Air Quality** section for a detailed discussion of the modeling methodology). Finally, the ACE model (developed by the Santa Barbara County Air

Pollution Control District and approved by CAPCOA) was used in conjunction with the reference exposure levels and unit risk factors presented in **PUBLIC HEALTH Tables 1 and 2** to estimate potential exposure levels and the health effects which might occur due to those exposures. 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 methods used by the applicant to assess health effects are consistent with those presented in the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spot" Program Revised 1992 Risk Assessment Guidelines (October 1993) referred to earlier, and result in the following health risk estimates.

NONCANCER HAZARD

The acute hazard index from exposure to all contaminants with an acute REL value listed in **PUBLIC HEALTH Tables 1 and 2** at the point of maximum impact is 0.04 (see **PUBLIC HEALTH Table 3**). The location of the maximum acute hazard is immediately north of the proposed site (PDEF 1998k, figure 5.16-2). As described earlier, a total hazard index of less than 1.0 indicates that facility emissions are not expected to result in any short-term adverse health effects, even in sensitive members of the population.

The combined chronic hazard index for substances having a chronic REL listed in **PUBLIC HEALTH Tables 1 and 2** at the point of maximum impact is 0.018 (see **PUBLIC HEALTH Table 3**). The location of the maximum chronic hazard is approximately five miles northeast of the proposed site at the southern base of the Montezuma Hills (PDEF 1998k, figure 5.16-2). The chronic hazard index is well under the safe level of 1.0, indicating that no long-term adverse health effects are expected.

PUBLIC HEALTH Table 3
Facility Hazard/Risk

Type of Hazard/Risk	Hazard Index/Risk	Significance (Safe) Level
Acute Noncancer	0.04	1.0
Chronic Noncancer	0.018	1.0
Individual Cancer	0.5×10^{-6}	1.0×10^{-6}

Source: AFC Supplement Table 5.16-1S, p. 5.16-3 and revised 3/99 HRA results

CANCER RISK

As shown in PUBLIC HEALTH Table 3, total worst-case individual cancer risk is estimated to be 0.5 in one million. As explained earlier, this is the maximum risk at the location where pollutant concentrations are calculated to be the highest. The location of this risk for the PDEF facility is approximately five miles northeast of the project site at the southern base of the Montezuma Hills (PDEF 1998k, figure 5.16-2).

CUMULATIVE IMPACTS

BAAQMD staff examined the issue of cumulative impacts from facilities affecting the same neighborhood (BAAQMD 1993). They concluded that elevated concentrations of toxic air contaminants from stationary sources tend to be quite localized and that cumulative risks are likely to occur only when multiple facilities with substantial low-level emissions are immediately adjacent to, or very close to, one another. The maximum cancer risks were found to be dominated by the impacts from single facilities. The proposed Delta Energy Center (DEC) site is approximately two miles from the PDEF site, so it is not likely that potential emissions from that facility would combine with PDEF emissions to result in significant cumulative effects in terms of public health impacts. In fact, preliminary screening modeling of DEC emissions indicates that the points of maximum concentrations of emissions from the two facilities would be completely disparate (see PDEF 1998k, Figure 5.16-2 and Calpine 1998, Figure 8.1C-1).

The conservative estimate of additional lifetime cancer risk due to emissions from the PDEF facility is less than one chance in one million (the de minimis risk level) at the point of maximum exposure. Similarly, upper-bound hazard estimates for both acute and chronic health effects due to the PDEF project are substantially lower than significance levels. Even in the highly unlikely event that emissions from an existing facility were to coincide both geographically and temporally with PDEF emissions at the locations of maximum impact, overall risk would not change significantly. Thus, for both cancer and noncancer health effects, the PDEF project will not meaningfully change the existing overall level of hazard or risk and will not result in significant cumulative health-related impacts.

FACILITY CLOSURE

As noted in the introduction to this section, the scope of staff's public health analysis is limited to routine releases of harmful substances to the environment. During either temporary or permanent facility closure, the major concern would be from accidental or nonroutine releases from either hazardous materials or wastes that may be onsite. These are discussed in the sections on **Hazardous Materials** and **Waste Management**, respectively. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the environment, since the facility would not be operating. For permanent closure, the only routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

MITIGATION

Excavation at the site or linear facilities could disturb contaminated soil that may require mitigation measures to prevent potential public health impacts. Staff has proposed adoption of a condition of certification in the **Waste Management** section which requires the project owner to have an environmental professional on site to

inspect locations where potentially contaminated soil is found, determine the need for future action, and potentially contact appropriate agencies for possible oversight.

Due to the levels of arsenic in the soil overlying the former biofarm areas, dust suppression methods for the PDEF will need to be implemented during construction. Measures will also have to be implemented to prevent the generation of dust during the lifetime of the facility.

Staff proposes the adoption of fugitive dust control measures to prevent the generation of dust with high levels of arsenic during project construction. These measures are located in the **Air Quality** section.

As part of the Corrective Measures Study, the Mark Group identified alternatives that are available to mitigate potential impacts following construction (Mark Group 1998, p. 18). The preferred alternative was identified as capping, which would prevent direct contact with impacted soil and prevent the generation of dust with higher-than-background arsenic levels. The process would use a minimum one-foot thick covering over all areas with high arsenic levels. The coverings would consist of either soil, gravel, asphalt or concrete paving, and would include structures such as buildings. In the **Air Quality** section, staff proposes the adoption of a condition of certification requiring that all areas identified as having higher-than-background arsenic levels be capped as proposed in the Corrective Measures Study. It is likely that additional soil will have to be brought on site, not only for capping purposes, but also to build up the site (see **Soil and Water Resources**). As recommended by the Phase I Environmental Site Assessment, public health staff is proposing a condition of certification requiring that all imported soils be tested for the presence of certain contaminants.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Staff concludes that construction and operation of the PDEF project will be in compliance with all applicable LORS.

CONCLUSIONS AND RECOMMENDATIONS

Staff has analyzed potential public health risks associated with construction and operation of the PDEF and does not expect there to be any significant adverse cancer, or short- or long-term noncancer health effects from any project emissions. With implementation of the conditions of certification included herein and in the **Air Quality** and **Waste Management** sections as noted above, staff also concludes that construction activities will not pose any adverse health effects from fugitive dust or disturbance of contaminated earth.

CONDITION OF CERTIFICATION

PUBLIC HEALTH-1 Any soil that is to be imported shall be sampled and analyzed by the project owner for: metals, total petroleum hydrocarbons (TPH) as motor oil, gasoline, and diesel, volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) to document that the imported soil does not contain concentrations of these compounds in excess of health-based risk levels.

Verification: The project owner shall maintain records documenting the sampling and analysis that has been performed pursuant to condition **PUBLIC HEALTH-1** and shall make such records available to the Energy Commission Compliance Project Manager upon request.

REFERENCES

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PDEF (Pittsburg District Energy Facility, LLC/Thompson) 1998d. Applicant's Responses to CEC Data Requests. Submitted to the California Energy Commission, September 24, 1998.

PDEF (Pittsburg District Energy Facility, LLC/Parquet) 1998k. Supplement to the Application for Certification, Pittsburg District Energy Facility (98-AFC-1). Submitted to the California Energy Commission, December 7, 1998.

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WORKER SAFETY AND FIRE PROTECTION

Testimony of Ellen Townsend-Smith

INTRODUCTION

Industrial workers use process equipment and hazardous materials on a daily basis. Accidents involving relatively small amounts of material can result in serious injuries to workers. Worker protection measures can include special training, protective equipment and procedural controls. The employer must also comply with applicable laws, ordinances, regulations, and standards (LORS) to protect workers. This Worker Safety and Fire Protection analysis assesses the completeness and adequacy of the measures proposed by the Pittsburg District Energy Facility (PDEF) to comply with applicable health and safety standards and other reasonable requirements (Cal. Code Regs., tit. 20, §1743), and to draw conclusions about the compliance of the proposed project with applicable LORS (Cal. Code Regs., tit. 20, §1744). These standards are designed to protect the health and safety of workers during construction and operation of the facility, and to establish adequate fire protection and emergency response procedures.

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

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

Staff has determined that the features of the project comply with applicable LORS and do not present unusual industrial safety or fire protection problems.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

- 29 U.S.C. §651 et seq. (Occupational Safety and Health Act of 1970)
- 29 C.F.R. §1910.120 (HAZWOPER Standard) Defines the regulations for Hazardous Waste Operations and Emergency Response. This section covers the clean-up operations, hazardous removal work, corrective actions, voluntary clean-up operations, monitoring, and emergency response required by Federal, state, and local agencies of hazardous substances that are present at controlled and uncontrolled hazardous waste sites.

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

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

STATE

- Title 8, California Code of Regulations, §450 et seq. (Applicable requirements of the Division of Industrial Safety, including Unfired Pressure Vessel Safety Orders, Construction Safety Orders, Electrical Safety Orders, and General Industry Safety Orders)

- Title 8, California Code of Regulation, §5192 (HAZWOPER Standard) Defines the regulations for Hazardous Waste Operations and Emergency Response. This section covers the clean-up operations, hazardous removal work, corrective actions, voluntary clean-up operations, monitoring, and emergency response required by Federal, state, local agencies of hazardous substances that are present at controlled and uncontrolled hazardous waste sites.

LOCAL

- Uniform Fire Code (UFC). The uniform fire code contains provisions necessary for fire prevention and information about fire safety, special occupancy uses, special processes, and explosive, flammable, combustible and hazardous materials.

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

- California Building Code. (Cal. Code Regs., tit. 24, §501 et seq.) The California Building Code is designed to provide minimum standards to safeguard human life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, etc. of buildings and structures.

EVALUATION CRITERIA

Staff has reviewed the PDEF Application for Certification (AFC) 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.

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

SETTING

PDEF is located in an industrial area. Offsite fire protection is provided by the Contra Costa Fire Protection District. There are three fire stations located close to the facility. The fire stations as shown in **SAFETY Table 1**, have all or some of the following items: An engine, a truck, a power wagon, and a water tender. The engine is a primary response unit. It has a 500 gallon water tank, a 1,500 gallon per minute (gpm) pump, 2,000 feet of hose and a medical response unit. The trucks are also primary response units, and have a 200 gallon water tank, a 1,250 gpm pump, 1,000 feet of hose and an aerial ladder with a water tower. Power wagons are primarily used for fighting wild fires, such as grass fires. Each consists of a 300 gallon water tank, 130 gpm water pump, and comes with four wheel drive. The water tender has a 2,000 gallon water supply, a 500 gpm pump, and an auxiliary 2,000 gallon folding tank. None of the three facilities have hazardous materials response capabilities. When there is a hazardous materials incident, the fire stations request assistance from the Contra Costa County Hazmat Team (Hott 1998). During emergencies, emergency response teams will gain access to PDEF via East Third Street (PDEF 1998b).

The site is located on the USS-POSCO property, which was previously used for sludge drying beds and biofarming. The biofarm areas were used to treat wastewater sludges from the wastewater treatment facility (Woodward-Clyde 1998). The soil sludge drying beds containing metals and organics have been excavated and removed. The majority of the site is overlain with imported soil (PDEF 1998a page 5.8-3).

Construction workers may come into contact with contaminated soil and groundwater while excavating soil below the imported fill. The applicant will develop a Site Health and Safety plan that will identify mandatory safety procedures (PDEF 1998c page 5.17-1). The applicant confirmed in the supplement to the AFC that they will conform with State and Federal HAZWOPER regulations.

WORKER SAFETY Table 1
Fire Station/Fire Protection Capabilities

Station	Response time	Equipment	Number of Firefighters
Station 84 200 E. 6th St. Pittsburg, CA	3 minutes	1 engine 1 truck 1 power wagon 1 water tender (2000 gallons Capacity)	6
Station 85 2255 Harbor St. Pittsburg, CA	5 minutes	1 engine 1 power wagon	3
Station 86 3000 Willow Pass Pittsburg, CA	5 minutes	1 engine 1 power wagon	3

IMPACTS

PROJECT SPECIFIC IMPACTS

FIRE PROTECTION

To determine if the project would impact the fire protection services in the area and if the fire protection at the plant would adequately protect workers, staff reviewed the information provided in the AFC regarding available fire protection services and equipment (Sections 3.4.10.1 and 5.17.2.1.2) (PDEF 1998a). The applicant will have a dedicated water supply that will provide the facility with two hours of protection. Fire protection systems will be dedicated to the transformers, turbine lubrication oil equipment and cooling tower. There will be fire alarms, detection systems, portable fire extinguishers and hose stations throughout the plant. The information provided by the applicant indicates that the project intends to meet the minimum fire protection requirements and therefore will not adversely impact fire protection services. The applicant will be required to provide final diagrams and plans to staff and to the Contra Costa County Fire Protection District, prior to construction and operation of the project, to confirm the adequacy of these fire protection measures. Please refer to conditions of certification **SAFETY-1** and **SAFETY-2**.

WORKER SAFETY

Industrial environments are dangerous. Workers are exposed to chemical spills, hazardous waste, fires, confined space entry and egress problems, and exposed to moving equipment. It is important for PDEF to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers.

MITIGATION

Separate Injury and Illness Prevention Programs (IIPPs) will be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase “Safety and Health Program” to refer to the measures PDEF will take to ensure compliance with applicable LORS during the construction or operation phases of the project.

CONSTRUCTION SAFETY AND HEALTH PROGRAM

The Construction Safety Orders found in Title 8 of the California Code of Regulations contain health and safety requirements promulgated by Cal/OSHA that are applicable to the construction phase of the project (Cal Code Regs., tit. 8, э 1500 et seq.). The various plans required by the regulations are incorporated in the project Construction Safety and Health Program, the major elements of which include:

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

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

PDEF provided adequate outlines in the AFC for each of the above programs and plans, and prior to construction of the facility, will provide detailed programs and plans in accordance with condition of certification **SAFETY-1**.

OPERATION SAFETY AND HEALTH PROGRAM

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

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

PDEF provided adequate outlines for each of the programs and plans in the AFC and will provide detailed programs and plans in accordance with condition of certification SAFETY-2.

Safety and Health Program Elements

The applicant has provided proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. Below is a list of the major items required in both Safety and Health Programs.

Injury and Illness Prevention Program (IIPP)

PDEF has provided an adequate draft outline for an Injury and Illness Prevention Program (IIPP) (PDEF 1998a). PDEF will need to submit an expanded Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to both construction and operation of the project.

Cal/OSHA will review and provide comments on the IIPP as the result of an onsite consultation at the request of PDEF, during which a Cal/OSHA representative will complete a physical survey of the site, analyze the work practices, and point out those practices that are likely to result in illness or injury. The on-site consultation will give Cal/OSHA an opportunity to evaluate PDEF's IIPP and apply it directly to activities taking place on-site (Glendenning 1998).

Emergency Action Plan

California Code of Regulations, tit. 8, Section 3220 contains the requirements for an Emergency Action Plan. The AFC contains a satisfactory outline for an emergency action plan (PDEF 1998a). The outline lists the following features; fire and emergency reporting procedures, evacuation procedures, and a Spill Prevention/Control and Countermeasures Plan. Staff proposes condition of certification **SAFETY-2**, which requires PDEF to submit a final Operation's Emergency Action Plan to Cal/OSHA, for review and comment after an on-site consultation.

Fire Protection Plan

California Code of Regulations, tit. 8, section 3221 establishes the requirements for an Operation Fire Prevention Plan. The AFC contains a draft proposed fire protection plan which is adequate for staff's analysis. The plan discusses the following topics:

- On-site Fire Protection Systems, including carbon dioxide extinguishing systems, preaction sprinkler systems, a dry pipe deluge system, hand-held fire extinguishers, and fire detection and alarm systems;

- Local Fire Protection Services.

Staff proposes that PDEF submit a final Fire Protection Plan to the California Energy Commission Compliance Project Manager (CPM) and the Contra Costa County Fire Department for review and approval to satisfy proposed conditions of certification **WORKER SAFETY-1** and **2**.

Personal Protective Equipment Program

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

Under California Code Regulations, tit. 8, sections 3380 - 3400, personal protective equipment will be required whenever hazards are encountered which, due to process, environment, chemicals, or mechanical irritants, can cause injury or impairment of body function as a result of absorption, inhalation, or physical contact. The project's operational environment will create potential situations where personal protective equipment is required.

PDEF's PPE Program should include a written policy on the use of protective equipment and methods of communicating it to the employees, selection of the proper type of equipment, training of employees on the correct use and maintenance of the equipment, and enforcement of personal protective equipment use.

PDEF's PPE program should include the use of devices that provide respiratory protection, hearing conservation, eye protection, and head protection. Staff believes that if PDEF develops and carries out a PPE Program similar to the format and elements listed above, the program will meet applicable regulations and will significantly reduce the potential for adverse impacts to workers.

General Safety

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

Lighting

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

Hazardous Materials Releases

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

Smoking

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

Lock-out/Tag-out

California Code of Regulations, title 8, Sections 2320.4, 2320.5, 2320.6, 2530.43, 2530.86, 3314, and 6003 identify required lock-out and tag-out safety practices and programs which reduce employee exposure to moving equipment, electrical shock, and hazardous and toxic materials. Lock-out is the placement of a padlock, blank flange, or similar device on equipment to ensure that it will not be operated until the lock-out device is removed. Tag-out is the use of warning signs that caution personnel that equipment cannot be energized until the lock-out device is removed. Warning signs can also be used to alert employees about the presence of hazardous and toxic materials. PDEF's lock-out/tag-out program should include steps for applying locks and tags, steps for removing locks and tags, and employee training on lock-out/tag-out procedures.

Confined Spaces Entry

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

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

Hot Work

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

CUMULATIVE IMPACTS

There are no cumulative impacts.

FACILITY CLOSURE

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

CONCLUSION AND RECOMMENDATIONS

CONCLUSIONS

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

RECOMMENDATIONS

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

PROPOSED CONDITIONS OF CERTIFICATION

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

- Construction Injury and Illness Prevention Program
- Construction Fire Protection and Prevention Plan

- Personal Protective Equipment Program

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

The Construction Fire Protection and Prevention Plan shall be submitted to the Contra Costa County Fire Department for review and acceptance.

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

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

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

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

The Operation Fire Protection Plan and the Emergency Action Plan shall be submitted to the Contra Costa County Fire Department for review and acceptance.

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

The project owner shall notify the CPM that the Project Operation Safety and Health Program (Injury and Illness Prevention Plan, Fire Protection Plan, the Emergency

Action Plan, and Personal Protective Equipment requirements), including all records and files on accidents and incidents, is present on-site and available for inspection.

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

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

REFERENCES

Brauer, Roger L. 1990. Safety and Health for Engineers. 1990.

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Hotts, Don. Engineer at Pittsburg Station 84. Personnel communication with Ellen Townsend-Smith regarding review of applicant's offsite fire protection. October 28, 1998.

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TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam

INTRODUCTION

The electricity generated at the proposed Pittsburg District Energy Facility (PDEF) will be transmitted to the existing Pacific Gas and Electric (PG&E) power grid through a double circuit 115 kV line consisting of an overhead section and an underground section. A 115 kV feed line will also be constructed to conduct power from the PDEF to the USS/POSCO steel mill and other users. Operating such lines could create several health and safety hazards, as described in the submittal by the applicant (PDEF 1998a, pp 4.2-3 through 4.2-8). Such hazards will be reduced through compliance with laws, ordinances, regulations and standards (LORS) identified by the applicant as applicable to the proposed project (PDEF 1998a, p 4.1-1).

The purpose of staff's analysis is to assess the proposed transmission line design for appropriate incorporation of measures necessary for compliance with applicable LORS. If found satisfactory, staff will recommend that the line be approved as proposed; if not, staff will recommend design revisions to further mitigate the health and safety hazards that could result. The assessment will evaluate the following issues, which relate primarily to the physical presence of the line, or secondarily to the physical interactions of line electric and magnetic fields, as will be discussed later.

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

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Discussed below by subject area are design-related LORS applicable to the physical impacts of transmission lines as proposed for the power facility.

FEDERAL

AVIATION SAFETY

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

- Title 14, Part 77 of the Federal Code of Regulations (CFR), "Objects Affecting the Navigation Space". Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a "Notice of Proposed Construction or Alteration" is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.

- FAA Advisory Circular (AC) No. 70/460-2H, "Proposed Construction and or Alteration of Objects that May Affect the Navigation Space". This circular informs each proponent of a project that could pose an aviation hazard of the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA.

- FAA AC No. 70/460-1G, "Obstruction Marking and Lighting". This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

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

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

weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement. Since electric fields cannot penetrate the soil and other objects, underground lines do not produce the radio noise associated with overhead lines.

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

STATE

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

- GO-128 “Rules for Construction of Underground Electric Supply and Communications Systems”. Provisions of this order establish requirements and minimum standards for the safe construction of underground AC power and communications circuits.

AUDIBLE NOISE

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

FIRE HAZARDS

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

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

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

HAZARDOUS SHOCKS

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

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

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

- National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. Provisions in this part of the code specify the national safe operating clearances applicable in areas where the line might be accessible to the public. Such requirements are intended to minimize the potential for direct or indirect contact with the energized line.

LOCAL

There are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit their obstruction or hazardous shock hazards, or eliminate the interactive effects of their electric or magnetic fields. All the noted LORS are implemented industry wide to ensure that lines are uniformly constructed to reflect existing health and safety information while ensuring efficiency and reliability.

SETTING

According to information from the applicant (PDEF 1998a, pp 3.5-1 through 3.5-6, 1998b, 999), the proposed transmission line will be located in an area with existing 230 kV, 115 kV, and 60 kV transmission lines and related facilities owned by PG&E. Fields from the new line will therefore contribute to any cumulative exposures, visual impacts and other field-related environmental effects. The line will traverse industrial areas, open spaces and residential and commercial areas where it will be located underground to minimize its visual effects. The individual segments of the

proposed line are listed in the applicant's submittals (PDEF 1998a, p 3.5-1, PDEF 1998k, p 3-4) and described more fully in the **PROJECT DESCRIPTION** section. Since the line will be connected with the PG&E transmission system, it will be designed according to PG&E's field-reducing design guidelines related to safety, efficiency, reliability, and maintainability. Its right-of-way will vary from 80 ft to 100 ft.

Since residences are normally located beyond the edge of transmission line rights-of-way, the magnitude of any long-term residential exposures can be assessed from field strength estimates obtained for the edge of such rights-of-way. As will be discussed later, the biological consequences of such residential exposures are at the root of the present health concern about the presence of high-voltage lines.

PROJECT DESCRIPTION

PROJECT DESCRIPTION FIGURE 4 shows the applicant's preferred routes for the proposed transmission line. The line will consist of the components listed below.

- A double circuit 115 kV overhead/underground line connecting the proposed PDEF power plant with the existing PG&E 115 kV power grid along a route identified as Route 10;
- A 115 kV switchyard at the plant site and;
- A single circuit 115 kV line connecting this utility line with the USS/POSCO steel mill and other users along a route identified as Route 11.

According to the applicant (PDEF 1998k p 5.9-13), these preferred routes were chosen to parallel existing line corridors and the line located underground in residential and commercial areas, in keeping with the General Plan of Contra Costa County.

The first segment (the double circuit overhead segment) will exit from the power plant switchyard and travel southwest to Harbor Street, terminating at the intersection of 8th Street and Harbor Street. At this point, the line will go underground as it travels west in the 8th Street median. It will resurface as an overhead line just northwest of the 8th Street-Bacon Street intersection from which it will travel north and connect to the existing 115 kV switchyard at PG&E's Pittsburg Plant. The aboveground segment will be constructed using 150 ft tall steel poles erected every 500 to 700 ft.

The underground section of the line will be located within a duct bank with a metal shield around each conductor. Because of the cancellation effects of these closely spaced conductors, the ground-level strength of the magnetic fields from this section will be much less than those from the more widely spaced overhead section of the same current-carrying capacity. However, exposure to an individual directly over such a line would be higher than if overhead because of the shorter distance to the buried cables. The intensity of such fields diminishes rapidly with distance from the source. Since electric fields are unable to penetrate the soil or other materials,

they will not be encountered on the ground above the line. This underground section will be constructed according to the requirements in GO-128.

The second segment (the single circuit overhead line) from the proposed line to the USS/POSCO steel mill, will traverse a mostly industrial area with limited potential for residential electric and magnetic field exposures. The connection will be made at the existing USS/POSCO switchyard. This line will be erected on 130- ft tall lattice or steel poles. The support structures for each segment are illustrated in the **Project Description** section.

IMPACTS

As noted in the LORS section, GO-95, GO- 128 and Title 8, CCR provide the minimum regulatory requirements necessary to avoid the direct or indirect contact previously discussed in connection with hazardous shocks and aviation hazards. Of secondary concern in project evaluation are the field-related impacts manifesting as nuisance shocks, electric and magnetic field exposure and radio noise and communications interference as also discussed. These impacts are reduced through specific field-reducing design guidelines established by the CPUC for each utility service area in the state. As will be more fully discussed later, these guidelines were established to ensure uniformity in EMF reducing approach, in light of present knowledge on field effects and the potential impacts of field control measures on line operations. The extent of such measures, together with the related field strengths, will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. When the ground-level strengths of such fields are calculated, they can be used to assess each line for appropriate implementation of the applicable field-reducing measures. The impacts of most concern in this EMF context are nuisance shocks and electric and magnetic field exposure. These secondary impacts are assessed for every project in addition to the primary issues of aviation safety, hazardous shocks.

NUISANCE SHOCKS

Nuisance shocks around transmission lines are non-hazardous but unpleasant experiences caused by current flow at levels generally incapable of causing significant physiological harm. Such shocks mostly result from direct contact with metal objects in which electric charges are induced by fields from the energized line. For modern high-voltage lines, shocks of this type are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). As with lines of the types proposed, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

The previously noted possibility of health effects in individuals exposed to electric and magnetic fields has increased public fears in recent years about living near

high-voltage lines. Both fields occur together whenever electricity flows. It is for this reason that exposure to them is generally considered together as EMF exposure. As noted by the applicant (PDEF 1998a, p 4.2-6), the available evidence as evaluated by CPUC and other regulatory agencies, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to realize that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate, in light of present uncertainty, to reduce such fields to some degree until the issue is better understood. The challenge has been to establish when, and how far to reduce such fields.

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

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns relate to the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency and maintainability if applied too far.

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

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

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It required the previously noted EMF-reducing design guidelines to ensure uniformity in reduction approaches. Such guidelines were required of all utilities under CPUC's jurisdiction. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements.

In keeping with this CPUC policy, staff requires a showing that each proposed line be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability efficiency and maintainability. It, therefore, is up to each applicant to ensure that such measures are applied in ways, and to an extent without significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Such field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since the overhead and underground sections of the proposed line will be designed according to PG&E's EMF-reducing guidelines, their fields are required under existing CPUC policies to be similar to fields from similar lines in the PG&E service area. A condition of certification (**TLSN-3**) is proposed by staff to ensure implementation of the reduction measures necessary.

PROJECT SPECIFIC IMPACTS

AVIATION SAFETY

As noted by the applicant (PDEF 1998a, p 4.2-3), there are no major airports in the vicinity of the proposed facility. The nearest airport, Buchanan Field Airport in Concord, is located about 9.5 miles west-southwest of the project site. Other area airports are much farther away. An FAA "Notice of Construction or Alteration" will not be required for the proposed power line, according to existing regulatory criteria. PDEF, however, intends to file an advisory notice with the FAA with regard to two

project-related 150-ft tall stacks. Lighting will be provided in accordance with FAA requirements. From its consideration of all issues related to distance from the line and FAA safety requirements, staff is in agreement with the applicant that the project and related facilities will not pose a significant hazard to area aviation.

Interference with Radio-Frequency Communication

Experience has shown that spark gap discharges are mostly responsible for any radio interference around the type of transmission line proposed. Such interference is generally avoided through appropriate maintenance, which minimizes the occurrence of the structural gaps involved. The applicant intends to institute such a maintenance program with regard to the proposed line (PDEF 1998a, p 4.2-5). The previously noted provisions of the related FCC regulations are important in requiring each project owner to ensure mitigation of any such interference to the satisfaction of the effected individual. The applicant intends to investigate and mitigate any such complaints to the extent feasible (PDEF 1998a, p 4.2-5). The applicant has further noted that, for the proposed line design, the expected electric field of 0.7 kV/m at the edge of the 80-ft right-of-way (0.5 kV/m for the 100-ft right-of-way) would be at levels not producing perceivable radio noise (PDEF 1999). This is as staff expects for a line of the voltage proposed. Staff has proposed a condition of certification **(TLSN-2)** to ensure mitigation of any interference-related complaints on a case-specific basis as required by the FCC. **TLSN-1** is also proposed by staff to ensure compliance with GO-52 also intended to prevent radio interference.

Audible Noise

According to information from the applicant (PDEF 1998a, pp 5.12-1 through 5.12-8, and PDEF 1998c), background noise at the nearest residence averages 68 dBA, as determined from a survey conduced on May 6 and 7, 1998. The maximum electric field strength of 1.5 kV/m directly underneath the line would produce noise of less than 2.0 dBA at the edge of the proposed right-of-way. The applicant therefore does not expect the noise from the proposed line design to add significantly to the existing background levels. This will be in keeping with requirements in the Noise Element of the General Plan of the City of Pittsburg (PDEF 1998a, p 5.12-5). Staff is in agreement with the applicant regarding the noise level expected for the line voltage and the conductor configuration proposed. For an assessment of the noise from all phases of the proposed power plant and related facilities, please refer to staff's analysis in the **Noise** section.

Fire Hazards

The overhead section of the proposed line will be routed through grassland, shrub-covered and urban areas of relatively few trees, where adequate fire prevention and suppression measures will be implemented, as required by related regulations (PDEF 1998a, pp 4.2-7 and 4.2-8). Compliance with GO-90 requirements will ensure the clearance necessary to prevent fires, which could be caused by direct contact of the transmission line with trees and other objects. Such fires are not expected for the underground section as proposed. Compliance with condition of certification **TLSN-4,** as staff proposes, will prevent accumulation of combustible materials that would accelerate such fires.

Hazardous Shocks

The applicant has stated their intention to comply with the requirements of GO-95, intended to prevent hazardous shocks from direct or indirect human contact with the overhead energized line. Therefore, they do not expect the proposed line to pose any such hazards to humans (PDEF 1998a, p 4.2-6). Staff does not expect such a hazard from the line as proposed and proposes a condition of certification (**TLSN-1)** to ensure implementation of the GO-95-related measures necessary. Compliance with GO-128 requirements as also required by this condition, will ensure the safe operation of the underground section of the line.

Nuisance Shocks and Electric and Magnetic Fields

The applicant calculated the electric and magnetic field strengths across the line's 80 ft to 100 ft right-of-way and found them to be typical for the field-reducing configuration proposed (PDEF 1999).

The magnetic field strength for the overhead section of the proposed line was calculated as 100 mG at the edge of the 80-ft right-of-way and 60 mG at the edge of the 100-ft right-of-way. For the underground section, a magnetic field strength of 25 mG was calculated for the edge of the 80-ft right-of-way and 15 mG for the 100 ft right-of-way. These values as noted by the applicant are similar to magnetic fields from similar lines and significantly below the levels (150 mG to 250 mG) established by states with regulatory limits on such fields.

An electric field strength of 1.5 kV/m was calculated for the area directly under the overhead section of the line. This is similar in such location to fields from lines of similar voltage and design. Experience has shown nuisance shocks to be mostly associated with field strengths significantly greater than 1.6 kV/m in the transmission line environment. The electric field strength of 0.7 kV/m was calculated for the edge of the 80 ft right-of-way. For the 100 ft right-of-way, a field strength of 0.5 kV/m was calculated. These field strengths at these distances are characteristic of lines constructed using the field-reducing design proposed and are not associated with nuisance shocks when all potential sources of such shocks are properly grounded . Since electric fields cannot penetrate the soil and other materials, electric fields and their related effects would be absent in the area around the underground section of the proposed line. Staff has verified the accuracy of the applicant's calculations with regard to parameters and assumptions bearing on field strengths and dissipation, as well as exposure assessment. Condition of certification **TLSN-3** is proposed by staff to verify that the fields are reduced to the extent proposed by the applicant. Conditions of certification **TLSN-5** and **TLSN-6** are proposed to ensure the preventive measures necessary for mitigation in the case of property owners along the route. These field strengths are similar to those of transmission lines within the PG&E service area.

CONCLUSIONS AND RECOMMENDATIONS

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

term, mostly residential magnetic exposure at the root of the present health concern will likely occur in the area beyond the edge of the right-of-way. Project-related exposures estimates for such areas are significantly below levels associated with lines of the same voltage and current-carrying capacity. They also are significantly lower than levels established by states with specific regulatory limits for such fields. Any nuisance shocks from such lines will be minimized through grounding and other measures to be implemented by the applicant. Compliance with GO-90, GO-128 and Title 8, Section 2700 et seq. of the California Code of Regulations, will ensure the safety of humans around the line. Since the line will be located away from all area airports, any hazard to area aviation will be small. The use of an electric field-reducing conductor configuration together with an appropriate line maintenance program will minimize the potential for interference with radio-frequency communication.

Staff, therefore, recommends approval of the transmission line as proposed for the routes identified. If such approval is granted, staff recommends that the Commission adopt the following conditions of certification to ensure implementation of the measures necessary to achieve the field levels assumed for the line by the applicant.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed transmission line according to the requirements of GO-95,GO 128, GO-52 and Title 8, Section 2700 et seq. of the California Code of Regulations.

Verification: Thirty days before start of transmission line construction, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the transmission line will be constructed according the requirements of GO-95, GO-128 and Title 8, Section 2700 et seq. of the California Code of Regulations.

TLSN-2The project owner shall make every reasonable effort to identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the line and related facilities. In addition to any transmission repairs, the relevant corrective actions should include, but shall not be limited to, adjusting or modifying receivers, adjusting or repairing, replacing or adding antennas, antenna signal amplifiers, filters, or lead-in cables.

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

with the corrective action or agreement with the justification for a lack of action.

Verification: All reports of line-related complaints shall be summarized and included in the Annual Compliance Report to the CPM.

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields before beginning construction and after the line is energized. Measurements should be made at appropriate points along the route to allow verification of design assumptions relative to field strengths. The areas to be measured should include the facility switchyard and any residences near the right-of-way.

Verification: The project owner shall file a copy of the first set of pre-project measurements with the CPM at least 30 days before the start of construction. The post-project measurements shall be filed within 30 days after the day the line was energized.

TLSN-4 The project owner shall ensure that the transmission line right-of-way is kept free of combustible material as required under the provisions of section 4292 of the Public Resources Code and Section 1250 of the California Code of Regulations.

Verification: The project owner shall provide a summary of inspection results and any fire prevention activities along the right-of-way, in the annual compliance report.

TLSN-5 The project owner shall send a letter to all owners of property within or adjacent to the right-of-way at least 60 days prior to first transmission of electricity.

Protocol: A discussion of the nature and operation of a transmission line.

- A discussion of the project owner's responsibility for grounding existing fences, gates, and other large permanent chargeable objects within the right-of-way regardless of ownership.

- A discussion of the property owner's responsibility to notify the project whenever the property owner adds or installs a metallic object which would require A statement recommending against fueling motor vehicles or other mechanical equipment underneath the line.

Verification: The project owner shall submit the proposed letter to the CPM for review and approval 30 days prior to mailing to the property owners and shall maintain a record of correspondence (notification and response) related to this requirement, in a compliance file.

The project owner shall notify the CPM in the first Monthly Compliance Report that letters have been mailed and that copies are on file.

TLSN-6 The project owner shall ensure the grounding of any ungrounded permanent metallic objects within the right-of-way, regardless of ownership. Such objects shall include fences, gates, and other large objects. These objects shall be grounded according to procedures specified in the National Electrical Safety Code.

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

Verification: At least 10 days before the line is 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

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

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HAZARDOUS MATERIAL MANAGEMENT

Testimony of Rick Tyler

INTRODUCTION

The purpose of this analysis is to determine if the proposed Pittsburg District Energy Facility (PDEF) will have a significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts are identified, Energy Commission staff must also evaluate the potential for facility design alternatives or additional mitigation measures to reduce impacts to the extent feasible, as required pursuant to Title 20, California Code of Regulations, section 1748.5. This analysis reflects review of both the original Application for Certification and the December 7, 1998 Supplement for the project.

Hazardous materials to be used at the facility (see Appendix B) in quantities which exceed the reportable amounts defined in the California Health and Safety Code, Section 25532(a) (P), include the following:

- Aqueous ammonia
- Sulfuric Acid

Other hazardous materials stored in smaller quantities such as scale inhibitors (phosphate), oxygen scavengers, caustics for pH control, and hydrogen for generator cooling will be present at the proposed facility. However, these materials pose minimal potential for off-site impacts. Although not stored, the project will also involve the handling of large amounts of natural gas. Natural gas poses risk of both fire and explosion. This facility will also require the transportation of aqueous ammonia to the facility. Analysis of the risk associated with such deliveries is addressed in staff's Transportation analysis.

The use of aqueous ammonia poses the principal risk of off-site impacts in the event of a major accidental release. Aqueous ammonia is proposed as a substitute for the much more hazardous anhydrous form, which has a higher internal energy when stored as a liquified gas. The energy associated with the anhydrous form typically acts as a driving force in an accidental release which can rapidly introduce large quantities of the material to the ambient air, where it can be transported off-site and result in high down-wind concentrations. Use of aqueous ammonia reduces this risk, as emission of ammonia from an aqueous solution driven by evaporation from the surface of the spilled solution. Staff believes that the use, handling and storage of aqueous ammonia, with the proposed mitigation, poses minimal potential to cause significant off-site impacts.

LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

The following federal, state, and local laws and policies generally apply to the protection of public health and hazardous materials management. Their provisions

have established the basis for staff's determination regarding the significance and acceptability of project-related impacts on public health due to accidental releases of hazardous materials.

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Acts (codified in 40 C.F.R., section 68.115, part F) require the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of these Acts are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

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

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

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

California Government Code, section 65850.2 restricts the issuance of a certificate of occupancy permit to any new facility involving the handling of acutely hazardous materials until the facility has submitted an RMP to the administering agency with jurisdiction over the facility.

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. Article 80 was extensively revised in the latest (1994) edition. These articles contain requirements that are generally similar to those contained in the Health and Safety Code. The UFC does, however, contain unique requirements for secondary containment, monitoring, and treatment of toxic gases emitted through emergency venting. These unique requirements are generally restricted to extremely hazardous materials.

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

SETTING

SITE AND VICINITY DESCRIPTION

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

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

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

METEOROLOGICAL CONDITIONS

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

Recorded wind speeds and ambient air temperatures are described in the air quality section of the A FC (PDEF 1998a, AFC Chapter 5.2). This data indicates that wind speeds below 3 knots and temperatures exceeding 100°F are not uncommon for the project area (see AFC Appendix 1 A). Therefore, staff suggested that the applicant use F stability (stagnated air, very little mixing), one meter/second wind speed and an ambient temperature of 100° F in its modeling analysis of an accidental release to reflect worst case atmospheric conditions. These conditions

were reflected in the modeling used to estimate the potential worst case impacts associated with an accidental ammonia release.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. There is no elevated terrain in close proximity to the project site.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses (Calabrese 1978). Also, the location of the population in the area surrounding a project site may have a large bearing on health risk. Public Health Figure 5.16-2 of the application is a diagram showing the locations of both population and sensitive receptors in the project vicinity.

IMPACTS

The Energy Commission staff has determined that the project poses no significant potential for impacts associated with hazardous materials handling.

AQUEOUS AMMONIA

Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NOx) from the combustion of natural gas in the facility. The accidental release of ammonia can result in hazardous down-wind concentrations of ammonia gas. However, the proposed mitigation including underground secondary containment in the delivery area and a double walled storage vessel will confine all significant ammonia concentrations to the project site in the event of an accidental release.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health level (IDLH) of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) 2 level of 200 ppm, which is also the RMP level 1 criterion used by EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for one time exposure of 75 ppm. A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis. If the exposure associated with a potential release would exceed 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff may also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Staff may, based on such

analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

The Hazardous Materials Handling section of the application included worst case analysis of a release of ammonia. It was also assumed that winds of one meter per second and category F stability would exist at the time of the accidental release. This screening analysis was designed to predict impacts based on distance from the storage tank without regard to specific direction of transport. HAZMAT Figure 5.15-5 in the AFC and December 7, 1998 supplement shows the results of this modeling, which do not indicate a potential for significant impacts in the event of such a release. This modeling indicates that a worst case release would not result in significant ammonia concentrations above 75 ppm beyond the site boundaries.

SULFURIC ACID

While sulfuric acid is a listed hazardous material, the form proposed for use (PDEF 1998a, AFC §5.15.2.2) contains sufficient water to reduce its vapor pressure to such low levels that insignificant amounts of sulfuric acid would be evolved in the event of an accidental release.

NATURAL GAS

Natural gas, which will be used as a fuel by the project, poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on-site. The risk of a fire and/or explosion from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) Code 85A requires: 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures will significantly reduce the likelihood of an explosion in the heat recovery steam generators. Additionally, start-up procedures will require air purging of the gas turbines and fire boxes prior to start-up to preclude the presence of an explosive mixture. This facility will also require the installation of a natural gas pipeline that could result in accidental release of natural gas. An analysis of the natural gas pipeline is provided in staff's Facility Design analysis.

It is staff's belief that these mitigation measures, as proposed by the applicant, will reduce to insignificant levels the potential for impacts associated with the use of natural gas.

CUMULATIVE IMPACTS

With the mitigation proposed the facility will not result in any significant off-site impacts it therefore, will not contribute any additional risk to those which already effect the surrounding populations.

FACILITY CLOSURE

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. Therefore, closure has no bearing on the responsibility to continue handling such materials in a safe manner, as required by applicable laws.

MITIGATION

The typical methods used for mitigating accidental releases of hazardous materials are as follows:

- use of non-hazardous or less hazardous materials,
- use of engineered controls,
- use of administrative controls, and
- emergency response planning.

The project will use all of these methods to reduce the potential for impacts associated with hazardous materials use and handling. It is staff's conclusion that the proposed mitigation will be effective in reducing the potential for impacts associated with an accidental release of hazardous materials to insignificant levels.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

Staff's evaluation of hazardous materials handling and use for the proposed project indicates that they pose minimal potential for significant impacts on the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable LORS. In response to Health and Safety Code, section 25531 et seq., the applicant will be required to submit a RMP. The EPA, Contra Costa County and staff will evaluate the RMP, including the hazardous materials storage and handling systems and the risk assessment provided by the applicant, and indicate whether they are satisfied with the proposed facilities. To insure adequacy of the RMP, staff has required that the plan be submitted for concurrent staff review and that confirmation of Contra Costa County's approval also be submitted prior to delivery of any hazardous materials to the facility.

With adoption of staff's proposed conditions, the project will comply with Health and Safety Code, section 41700, as it will not pose any potential for significant impacts to the public from hazardous materials releases.

RECOMMENDATION

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

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material in reportable quantities, as specified in Title 40, Code Of Federal Regulations, Part 355, Subpart J, section 355.50, that is not listed in Tables 5.15-1 and 5.15-2 (see Appendix B), unless approved in advance by the CPM.

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

HAZ-2 The project owner shall provide a Risk Management Plan and Process Safety Management Plan to Contra Costa County and the CPM for review and approval at the time the plans are first submitted to the U.S. Environmental Protection Agency (EPA) and the California Occupational Safety and Health Administration (Cal OSHA). The project owner shall reflect all recommendations of Contra Costa County and the CPM in the final document. A copy of the final plans, reflecting all comments, shall be provided to Contra Costa County and the CPM once approved by EPA and Cal OSHA.

Verification: At least sixty (60) days prior to the delivery of any hazardous materials to the facility, the project owner shall provide the final approved plans listed above to the CPM.

REFERENCES

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

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HAZARDOUS MATERIAL MANAGEMENT APPENDIX A

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

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

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

APPENDIX A Table1
Acute Ammonia Exposure Guidelines

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

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

REFERENCES

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

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

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

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

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

ABBREVIATIONS

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

HAZARDOUS MATERIALS MANAGEMENT APPENDIX B

TABLE 5.15-1

PITTSBURG DISTRICT ENERGY FACILITY
SUMMARY OF WATER TREATMENT CHEMICAL USAGE AND STORAGE

Chemical[1]	Chemical Abstract Service (CAS) Numbers	Application	Storage Location	Storage Quantity (Gallons) Average	Storage Quantity (Gallons) Maximum	Storage Method	Hazardous Characteristics
Sulfuric Acid (93%) (H_2SO_4)[2]	7664-93-9	pH control of cooling water and feed water	Water and treatment plant area	3,500	5,000	Bulk Tank	Corrosive, acid, toxic
Sodium Hydroxide 50 % (NaOH)[3]	1310-73-2	pH control Regeneration and water neutralization	Water treatment area	**3,000**	**5,000**	Drums or returnable tanks	Corrosive, base, toxic
Oxygen Scavenger (30% concentration)	7732-18-5	Chemical removal of dissolved oxygen	Water treatment area	55	55	Drums	Irritant, sensitizer
Neutralizing Amine (20% concentration)	110-91-8	Removal of dissolved carbon	Water treatment area	100	**100**	Drums	Corrosive, toxic, combustible
Di-sodium Phosphate (20% concentration)	7558-79-4	Removal of dissolved hardness ions, scale deposit control	Water treatment area	**500**	**750**	Drums	**Base, irritant**
Tri-sodium Phosphate (20% concentration)	7601-54-9	Removal of dissolved hardness ions, scale deposit control	Water treatment area	**500**	**750**	Drums	**Base, irritant**
Sodium Hypochlorite (10% concentration)	**7732-18-5**	**Biocide for cooling water**	**Water treatment area**	**1,000**	**1,000**	**Drums**	**Corrosive, irritant, toxic**
Scale Inhibitors (typical Phospherse 8309 Inhibitor)	**--**	**Scale reduction in cooling water**	**Water treatment area**	**200**	**200**	**Drums**	**Corrosive, irritant**

Notes:
[1] Management procedures for these materials can be found in Section 5.15.3.2.
[2] California toxic chemical.
[3] California air toxic "hot spots" chemical.

TABLE 5.15-2

PITTSBURG DISTRICT ENERGY FACILITY
SUMMARY OF NONWATER TREATMENT CHEMICAL USAGE AND STORAGE

Chemical[1]	Chemical Abstract Numbers	Application	Storage Location	Storage Quantity (Gallons) Average	Storage Quantity (Gallons) Maximum	Storage Method	Hazardous Characteristics
Natural Gas	--	Fuel for power plant	Piped to facility on an as-needed basis	Not applicable	Not applicable	Not applicable	Flammable
Aqueous Ammonia (25% Concentration)[2]	7664-41-7	Air Pollution Control System, control of NOx	Selective Catalytic Reduction system	13,000	20,000	Bulk Tank	Corrosive
Hydraulic Fluid	Mixture	Equipment	Throughout plant	Initial fill	Initial fill	Not applicable	None
Insulating Oil (heat transfer)	Mixture	Electrical Equipment	Throughout plant	Initial fill	Initial fill	Not applicable	Combustible
Lubricating Oil	Mixture	Rotating Equipment	Throughout plant	Initial fill + replacement losses	25 gallons	5 x 5 gallon pails	Combustible
Battery Acid	7664-93-9	Batteries	Throughout plant	Initial fill	Initial fill	Not applicable	Corrosive, acid, toxic
Carbon Dioxide	124-38-9	Fire protection, generator purging	Throughout plant	8,000 lb. initial fill	Initial fill	Not applicable	Asphyxiant
Hydrogen	1333-74-0	Generator cooling	Not applicable	Initial fill	Initial fill	Not applicable	Flammable
Diesel Fuel	Mixture	Fuel for the emergency fire pump	Fire pump house	100 gallons	100 gallons	Tank	None
Ethylene Glycol	107-21-1	Cooling system additive	CTG refrigeration system	Initial fill + 100 gallons	110 gallons	Drums	Avoid ingestion
Acetylene Gas[2]	74-86-2	Welding gas	Maintenance	≈50 cubic feet	≈50 cubic feet	Gas cylinder	Flammable
Oxygen Gas	7782-44-7	Welding gas	Maintenance	≈50 cubic feet	≈50 cubic feet	Gas cylinder	Supports combustion

Notes:
[1] Management procedures for these materials can be found in Section 5.15.3.2.
[2] California toxic chemical.

WASTE MANAGEMENT

Testimony of Michael Ringer

INTRODUCTION

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

Energy Commission staff's primary concerns in its waste management analysis are to ensure that:

Wastes generated during constructing and operating the proposed project will be managed in an environmentally safe manner;

Disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities;

The management of the wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT (42 U.S.C. § 6901 ET SEQ.)

The Act, known as RCRA, sets forth standards for the management of hazardous solid wastes. The U.S. Environmental Protection Agency (EPA) may administer the provisions of RCRA in each state. However, the law allows EPA to delegate the administration of RCRA to the various states. When a state receives final EPA authorization, its regulations have the force and effect of federal law. EPA grants final authorization when a state program is shown to be equivalent to the federal requirements. The Department of Toxic Substances Control in California received final authorization on August 1, 1992.

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

- Record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- Labeling practices and use of appropriate containers,
- Use of a manifest system for transportation, and
- Submission of periodic reports to the EPA or authorized state.
- RCRA also establishes requirements applicable to hazardous waste transporters, including record keeping, compliance with the manifest system, and transportation only to permitted facilities.

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

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

STATE (GENERAL BACKGROUND LORS)

PUBLIC RESOURCES CODE § 40000 ET SEQ. (CALIFORNIA INTEGRATED WASTE MANAGEMENT ACT OF 1989)

These sections, comprising Division 30 of the Public Resources Code, regulate solid waste management in California and created the California Integrated Waste Management Board. The Board is required to adopt and revise minimum standards for solid waste handling and disposal, including design, operation, maintenance and ultimate reuse of solid waste processing or disposal facilities.

CALIFORNIA WATER CODE § 13000 ET SEQ. (PORTER-COLOGNE WATER QUALITY CONTROL ACT)

This law regulates the discharge of wastes which could affect water quality and is designed to protect surface and groundwaters of the state against contamination and loss of beneficial use. The Act requires the State Water Resources Control Board to classify wastes according to the risk of impairing water quality and the types of disposal sites according to the level of protection provided for water quality. Regional boards issue waste discharge requirements addressing the nature and limiting the release of any wastes which could degrade waters of the state.

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

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

STATE (PROJECT SPECIFIC LORS)

California Health and Safety Code § 25100 et seq. (Hazardous Waste Control Act of 1972, as amended).

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

Title 22, California Code of Regulations, § 66262.10 et seq. (Generator Standards)

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

LOCAL

There are no additional local LORS to be considered.

SETTING

PROJECT AND SITE DESCRIPTION

The PDEF project consists of a nominal 500 megawatt natural gas-fired combined cycle generating facility, water supply and discharge lines, aboveground steam line, electrical transmission line, and natural gas pipeline.

The proposed site is an existing industrial site currently owned and controlled by USS-POSCO Industries. To determine if the site has been contaminated, ENRON commissioned a Phase I Environmental Site Assessment (ESA) which was performed in accordance with American Society for Testing and Materials practice E 1527-93 (Woodward-Clyde 1998). The ESA reports that a portion of the site was used by USS-POSCO as beds to dry wastewater sludges from their wastewater treatment facility and as biofarm areas to treat oily sludges. The soil in the beds contained metals and organics and has been excavated and removed. The beds have been closed in accordance with California requirements under the Toxic Pits Cleanup Act. None of the organics analyses of soil and groundwater samples exceed the Preliminary Remediation Goals (PRGs) for a commercial/industrial use

of the site. Except for a limited area of shallow soils containing arsenic in excess of regulatory approved background levels, no other metals exceeded PRGs or health based risk levels (MARK Group 1998 in Woodward-Clyde 1998). The MARK Group recommended that shallow soil containing the higher levels of arsenic be either excavated and replaced with clean import soil, or covered with clean soil, asphalt, or concrete paving as a remediation measure. No other significant environmental condition (such as leaking tanks, etc.) was identified at the site. However, wooden railroad ties owned by USS-POSCO, which may be treated with creosote, are on the site and the Phase I ESA recommended their removal and proper disposition as part of site development.

As part of the ESA, Environmental Data Resources, Inc. (EDR) performed a search of regulatory records listing sites with leaking underground tanks, landfills, releases of hazardous materials, contaminated wells, sites where hazardous waste is handled, and facilities which release toxic chemicals to the air, water, or land ("The EDR Corridor Study Report"). The study area encompassed about one mile around the proposed site which includes proposed linear facilities (transmission, steam, water, gas, sewer lines, storm drains, and highway).

The EDR report identified 50 locations, each containing one or more sites, which were listed in at least one records database. Energy Commission staff identified eight of the fifty locations which are near PDEF linear facilities (see EDR map "Study Area for Pittsburg district Energy Facility": location nos. 5, 6, 9, 22, 23, 24, 30, 35, and 36). The listing of a site in one of the databases does not automatically mean that construction activities will have significant impacts. Certain types of sites may be affected by construction activities, such as those with contaminated soil, leaking underground tanks, or contaminated wells where excavation could unearth toxic material. However, other types of sites appear on various databases for reasons which are less important when considering potential impacts from construction. These include facilities which generate and ship hazardous wastes, treat hazardous wastes, and sites where contamination was reported but not found or had been cleaned up and required no further remedial action. Of the nine locations in proximity to proposed linear facilities, three (two subsites at location 24, three subsites at location 30, and one at location 9) were listed in databases indicating that some degree of contamination could exist which might be of concern during construction of linear facilities.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION

Project construction will generate both hazardous and nonhazardous wastes. The applicant estimates that up to 1,000 tons of nonhazardous solid wastes will be generated during construction of the generating facility and transmission, water, sewer, and natural gas lines (PDEF 1998a, AFC p. 5.14-3). Nonhazardous wastes include debris requiring removal during site grading and excavation, excess lumber

and concrete, scrap metal from welding and cutting operations, insulation, empty chemical containers, and paper, wood, glass, and plastic from packing materials. Those wastes which cannot be recycled will be disposed of at a Class III (nonhazardous) landfill (Id.).

Hazardous wastes, which may be generated during construction, include waste oil and grease, paint, spent solvent, welding materials, and cleanup materials from spills of hazardous substances. Such wastes will be collected in hazardous waste accumulation containers near the point of generation. The containers will be taken to the construction contractor's hazardous waste storage area and within 90 days will either be recycled or transported by a licensed hauler to licensed hazardous waste treatment and disposal facilities, as appropriate (PDEF 1998a, AFC p. 5.14-6). Initial cleaning of the heat recovery steam generators and auxiliary boiler will also generate waste cleaning solutions and filters. Used filters and dirt will be segregated for disposal offsite and used cleaning solutions will be contained onsite, tested, and taken to a licensed treatment facility (PDEF 1998a, p. 26).

Wastes may also be generated if soils contaminated above risk-based clean up levels are encountered during site preparation or linear facility construction. As noted above, some limited areas of shallow soil, containing elevated concentrations of arsenic, will require remediation. A Corrective Measures Study has been completed for the proposed site (Mark Group, 1998) that identifies four alternatives for remediation: (1) capping the contaminated soil to prevent direct contact and the generation of dust; (2) excavation of impacted soil followed by backfilling with clean soil; (3) chemical stabilization which immobilizes arsenic in the soil by converting it into a less soluble, mobile, or toxic form; and (4) soil washing which involves removing arsenic from soil which has been excavated and then backfilling the clean soil to excavated areas. Capping was chosen as the preferred alternative, thus eliminating the need to transport soil offsite. Although no other areas of onsite contamination were reported in the ESA, if additional contamination is found during site preparation, further remediation, including removal of soil, could be required. The applicant proposes to have a qualified environmental consultant on site during soil excavation activities to monitor conditions such as color, odor, and organic emissions which might indicate potential contamination (PDEF 1998b, response to data request 36, p. 36-SOIL-1). Soil that is identified as impacted will be stockpiled separately, sampled, and analyzed. Depending on the analytical results, the soil will be used as onsite fill, treated and used onsite, or disposed of offsite in an appropriate landfill.

Additional waste may also be generated during excavation for linear facility construction, especially near locations, described in the EDR report, which may contain contaminated soil. As noted earlier in the site description, wooden railroad ties owned by USS-POSCO, which may be treated with creosote, should be removed if the existing rail spur line is not planned to be used. The ties will either be recycled by USS-POSCO for onsite rail spur repair, recycled for offsite landscaping, or disposed of at a class II landfill (PDEF 1998a, p. 27).

Operation

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

Nonhazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, used filters, spent demineralizer resin, and cooling tower basin sludge. AFC Table 3.4.6-3 lists the amount, frequency of generation, and management of filters, resins, and sludges. On a daily basis, the quantities of other nonhazardous wastes generated from gas-fired facilities such as the PDEF project are typically minor, on the order of a few cubic yards or less, with some of the material being recyclable. Nonhazardous waste will be recycled where practical and the remainder disposed of to a Class III (nonhazardous) landfill, such as the Keller Canyon landfill (PDEF 1998a, AFC p. 5.14-3).

Hazardous wastes generated during routine project operation include cleaning solutions, spent air pollution control catalyst, used oil, used cleaning solvents, waste paint, contaminated cleanup materials, demineralizer regeneration waste, and empty chemical containers.

The oxidation catalyst, used for CO emissions control, and the selective catalytic reduction catalyst, used for NOx emissions control, must be replaced as they become contaminated, typically after several years' service. Classified as hazardous due to heavy metals content, about 16,000 cubic feet of spent catalyst will be returned to the manufacturer at intervals of about 3.5 years for reclamation or disposal (PDEF 1998a, AFC p. 5.14-7).

About 1,825 gallons of waste oil will be generated annually and will be taken to existing petroleum recycling facilities in California (PDEF 1998a, AFC p. 5.14-7). Waste solvents and oily wastes will also be recycled.

Used containers of hazardous substances, such as chemical containers or oil filters may be classified as hazardous wastes. However, if managed according to certain regulatory guidelines, such containers may be managed as nonhazardous (Cal. Code Regs., tit. 22, § 66261.7, 66266.130).

Chemical feed area drains consisting of spillage, tank overflows, maintenance operations, and area washdowns will be routed to a neutralization facility for pH adjustment along with demineralizer regeneration wastes. Such elementary neutralization is considered to be hazardous waste treatment under California regulations (Cal. Code Regs., tit. 22, § 67450.1 et seq.) and requires a permit from the Department of Toxic Substances Control.

Impact on Existing Waste Disposal Facilities

Nonhazardous waste which is not recycled will be disposed of at the Keller Canyon landfill in Pittsburg (PDEF 1998, AFC p. 5.14-7). That landfill is currently operating at over 800,000 cubic yards annually and has a remaining life of 40 years (PDEF 1998, AFC Table 5.14-2). Even discounting the effects of recycling on the total

amount of non-hazardous wastes destined for landfilling, staff concludes that the amount of such wastes generated during project construction and operation are insignificant relative to existing disposal capacity, and would not meaningfully impact the landfill's capacity or operating life.

Three Class I landfills in California are permitted to accept hazardous waste:

8. Chemical Waste Management's Kettleman Hills facility (Kings County). There is approximately eight million tons of remaining capacity which is operational and an additional four million tons of capacity which has been permitted but not yet constructed (Yarborough 1998, pers. comm.). The expected remaining life is 48 years.

9. Laidlaw Environmental Service's Lokern facility in Buttonwillow (Kern County). Remaining capacity is approximately 17 million tons with a lifetime of about 30 years (Nielson 1998, pers. comm.)

10. Laidlaw Environmental Service's facility in Westmoreland (Imperial County). The estimated remaining capacity is four million tons with a life expectancy of about 50 years (Yadvish 1998, pers. comm.).

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

CUMULATIVE IMPACTS

Due to the minor amounts of wastes generated during project construction and operation, the insignificant impacts on individual disposal facilities, and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes.

FACILITY CLOSURE

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

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

provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

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

For planned permanent closure, PDEF is required to develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure (PDEF 1998a, p. 28).

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

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

MITIGATION

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

- Hazardous wastes will not be stored on-site for periods longer than 90 days and will be stored in a segregated hazardous waste storage area surrounded by a containment structure to control leaks and spills (PDEF 1998a, AFC p. 5.14-8).

- Hazardous wastes will be collected by licensed hazardous waste haulers using manifests and managed only at authorized facilities (PDEF 1998a, AFC p. 5.14-9).

- Procedures to minimize hazardous waste generation will be established. Nonhazardous materials will be used instead of hazardous materials and wastes will be recycled whenever possible (PDEF 1998a, AFC p. 5.14-10).

- All hazardous wastes will be stored in labeled 55 gallon drums protected from environmental conditions and physical hazards and sources of heat and impact (PDEF 1998a, AFC p. 3.4-9).

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

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of the PDEF will not result in any significant adverse impacts if the applicant implements the mitigation measures proposed in the Application for Certification (98-AFC-1), the additional measure proposed by staff below, and the proposed conditions of certification.

Staff recommends that if potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, the applicant have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-93 Standard Practice for Phase I environmental Site Assessments) determine the need for sampling to confirm the nature and extent of contamination. If significant remediation may be required, the applicant should also contact representatives of the Contra Costa County Health Services Department and Region 2 of the California Department of Toxic Substances Control for possible oversight.

CONDITIONS OF CERTIFICATION

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

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

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

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

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

A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and

Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

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

WASTE-4 The project owner shall have an environmental professional (as defined by American Society for Testing and Materials practice E 1527-93 Standard Practice for Phase I environmental Site Assessments) on site during soil excavation activities. If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, or other signs, prior to any further construction activity at that location, the environmental professional shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner stating the recommended course of action. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the Contra Costa County Health Services Department and Region 2 of the California Department of Toxic Substances Control for guidance and possible oversight.

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

REFERENCES

Mark Group. 1998. Corrective Measures Study (CMS) Site L-B, USS-POSCO Industries, Pittsburg, California. Submitted to USS-POSCO Industries, December 31.

Nielson, D. 1998. Telephone conversation with Mike Ringer (California Energy Commission), February 4.

PDEF (Pittsburg District Energy Facility, L.L.C.). 1998. Application for Certification, Pittsburg District Energy Facility, (98-AFC-1). Submitted to the California Energy Commission, June 15.

PDEF (Pittsburg District Energy Facility, L.L.C.). 1998a. Response to California Energy Commission (CEC) staff data requests. Submitted to the CEC, September 24, 1998.

PDEF (Pittsburg District Energy Facility, L.L.C.). 1998b. Response to Concerned Unions for Responsible Energy (CURE) Data Requests Dated November 2, 1998. Submitted to the CEC, December 2, 1998.

Woodward-Clyde. 1998. Phase I Environmental Site Assessment,12 Acre Parcel, Planned Cogeneration Facility, USS POSCO, Pittsburg, California. April 30.

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LAND USE

Testimony of Eric A. Knight

INTRODUCTION

The land use analysis of the Pittsburg District Energy Facility (PDEF) focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. Indirect land use impacts, such as traffic, air quality, visual effects and noise are discussed in the corresponding sections of the Staff Assessment.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

STATE

DELTA PROTECTION ACT OF 1992 (PUBLIC RESOURCES CODE § 29700 ET SEQ.)

This Act created the Delta Protection Commission with a mandate to develop a long-term resource management plan for the Delta Primary Zone. The goals of the plan are to "protect, maintain and, where possible, enhance and restore the overall quality of the delta environment, including, but not limited to, agriculture, wildlife habitat, and recreational activities." All local general plans for areas within the Primary Zone are required to be consistent with the regional plan. The Secondary Zone consists of areas within the statutory Delta (as defined in Section 12220 of the California Water Code) but not part of the Primary Zone. Local general plans for land use within the Secondary Zone are not required to conform to the regional plan.

LOCAL

The proposed PDEF and its related facilities will be located in portions of Pittsburg, Antioch and Contra Costa County. Staff reviewed the land use planning documents listed below for goals, policies and regulations relevant to the proposed project. Only those goals, policies and regulations pertinent to this land use analysis are included here.

PITTSBURG GENERAL PLAN

The City of Pittsburg (Pittsburg) General Plan, last updated in 1988, consists of the seven mandatory elements (land use, circulation, housing, open space, safety, conservation and noise) and two optional elements (Parks and Recreation and Public Facilities, Institutions, and Utilities). The Pittsburg General Plan has three functions: 1) to enable the Planning Commission and City Council to establish long-range development policies; 2) to provide a basis for judging whether specific private development proposals and public projects are in harmony with the policies; and 3) to guide other public agencies and private developers in designing projects that are consistent with city policies. General Plan policies relevant to the project include:

Land Use Element, Section 2.8 Industrial Development:

- Guiding Policy 2.8A seeks to "protect the supply of land suitable for industrial purposes and, in cooperation with the County, actively promote the development of appropriate industrial uses."

- Guiding Policy 2.8B states Piitsburg's intent to "retain existing industry, and allow existing industrial uses to expand, consistent with other General Plan policies."

- Guiding Policy 2.8C encourages "new, clean, employment-intensive industry to locate in Pittsburg."

- Guiding Policy 2.8D seeks to "protect existing and new residential areas from adverse effects of new industry and, wherever feasible, of existing industry."

Public Facilities, Institutions, and Utilities Element: Guiding Policy 5.3J requires "the undergrounding of all utility lines adjacent to new construction as a condition of development."

Traffic and Circulation Element: Guiding Policy 6.3D seeks to "designate truck routes, and discourage unnecessary through traffic in residential areas through circulation system design and planning."

Downtown Specific Plan

A portion of the proposed 115 kilovolt (kV) transmission line (interconnecting the PDEF to an existing substation at the PG&E Pittsburg Power Plant) is within the area covered by the Downtown Specific Plan (1986). General Plan land use designations for areas within the Downtown Specific Plan that are traversed by the transmission line include Low Density Residential and Medium Density Residential.

Chapter 3, Downtown Residential Area – Area II: This portion of the Specific Plan includes residentially zoned and developed lands in the downtown area, generally located north of the Santa Fe Railroad, east and west of the commercial area along Railroad Avenue. Section 3.3B allows "public utility …structures and uses" on approval of a use permit.

Pittsburg Zoning Ordinance

The City of Pittsburg Zoning Ordinance (Title 18 of the Municipal Code) was adopted on March 19, 1990. The purpose of the zoning ordinance is to protect the public health, safety, and general welfare, and to implement the policies of the City General Plan. It contains regulations that establish zoning districts, govern the use of land and the placement of buildings and improvements within districts, and establish performance standards. The following provisions of the Pittsburg Zoning Ordinance are applicable to the project:

Section 18.08.100 classifies a power plant as a "heavy manufacturing industrial use."

Section 18.54.010 allows heavy manufacturing industrial uses in a General Industrial District on approval of a use permit.

Section 18.54.015 prescribes the following property development regulations for General Industrial Districts:

Minimum Lot Area (sq. ft.)	20,000
Minimum Lot Width (ft.)	100
Minimum Yards (ft.)	
Front	10
Side	N/A
Corner Side	10
Rear	N/A
Maximum Height of Structures (ft.)	50
Maximum Lot Coverage	75%
Maximum Floor Area Ratio (FAR)	0.75
Minimum Site Landscaping	5%

Section 18.54.020 requires design review of all projects proposed within a General Industrial District. The information required for design review is listed in section 18.36.210.

Section 18.54.100 provides an additional height allowance for structures in a General Industrial District equal to the number of feet the structure exceeds all minimum yard requirements, but only up to a maximum of 75 feet.

Chapter 18.78 applies regulations and design standards for off-street parking and loading facilities in all zoning districts. Section 18.78.040 requires heavy manufacturing uses to provide 1 off-street parking space per 1,000 sq. ft. of gross building floor area. Heavy manufacturing uses fall within Group Number II of Schedule B (section 18.78.040) and must comply with the following off-street loading space requirement:

Gross Floor Area (sq. ft.)	***Number of Spaces Required***
15,000 to 30,000	***1***
30,000 to 100,000	***2***
100,000 and over	***3***

Section 18.80.030 allows “a public utility distribution and transmission line, tower and pole and underground facility for distribution or transmission of the same, and appurtenances” in all zoning districts, without the need for a use permit (unless it is proposed in a residential district) and without regard to building height limitation.

Section 18.84.010 requires that an accessory structure in a General Industrial District comply with all regulations applicable to the main building on a site.

ANTIOCH GENERAL PLAN

The current City of Antioch General Plan (1988 - 2000) consists of the seven mandatory elements and several optional elements such as public infrastructure, growth management, social services, economic development and community image. The open space, conservation and noise elements have been combined within a broader category of Resources Management. The following General Plan policies are relevant to the project:

Community Character Goal – Policy #5: The City should continue to develop and maintain suitable and adequate landscaping, *utility undergrounding* (emphasis added), sign control, site and building design, parking and performance standards to ensure that all existing and future commercial and industrial developments are compatible with surrounding land uses.

Community Design Goal – Policy #6: Where not constrained by security or safety concerns, utility easements should be developed as linkages between sections of the City through the provision of bikeways, pedestrian pathways as well as locations for passive recreation activities near residential areas.

Health and Safety Goal – Policy #3 (Bullet #6): New pipelines and other channels carrying hazardous materials shall avoid residential areas and other immobile populations to the greatest extent possible.

ANTIOCH ZONING ORDINANCE

The current City of Antioch Zoning Ordinance was adopted on November 8, 1994. The following provisions of the Antioch Zoning Ordinance pertain to the project:

- New pipelines and other channels carrying hazardous materials shall avoid existing and approved residential areas and other immobile populations to the greatest extent possible. (P5.19)

- Pipelines no longer in use shall be abandoned to the satisfaction of the City Engineer and shall comply with all applicable Environmental Protection Agency (EPA) requirements for such abandonments. (P5.22)

CONTRA COSTA COUNTY GENERAL PLAN

The Contra Costa County General Plan (1995 – 2010) was adopted on July 1996. The following goals and policies are relevant to the project:

Transportation and Circulation Element:

Railroad Goal 5-V states that the County will “protect the existing railroad rights-of-way in the county for continued railroad use, utility corridors, roads, transit facilities, trails and other public purposes.”

Railroad Policies:

- Policy 5-72 states that "railroad rights-of-way shall generally be designated for Public/Semi-Public uses to reflect their importance to the County's economy."

- Policy 5-73 states that "encroachments into railroad rights-of-way by urban uses which would impact current rail operations or preclude future use of the corridors for trails or other public purposes shall be limited."

- Policy 5-74 states that "trails shall be considered an appropriate interim use of an abandoned railroad right-of-way."

- Policy 5-75 states that "encroachment of unsuitable land uses adjacent to abandoned railroad right-of-way shall be prevented where such uses would conflict with future uses of the right-of-way identified in the Land Use, and Transportation and Circulation Elements."

CONTRA COSTA COUNTY ZONING ORDINANCE

Railroad Corridor Combining District (Ordinance No. 87-19): Ordinance No. 87-19 added a "Railroad Corridor Combining District" overlay zone to the existing zoning designations of all railroad rights-of-way owned or occupied by Santa Fe, Southern Pacific, Union Pacific, and Bay Point-Clayton within the unincorporated area of the County. The ordinance states:

> "All land uses that were previously allowed under the existing, underlying zoning designations along the railroad right of way are allowed under this 'Railroad Corridor Combining District' Ordinance, provided that no new land uses and/or structures, including residences and pipelines for the transmission of oil, gas, water or other substances shall be established, and no such uses and/or structures presently existing shall be substantially expanded or altered, or demolished, without first having been granted a conditional use permit, through procedures established in the County Ordinance Code."

SETTING

The PDEF site is located within the Northeast River planning subarea, a major industrial sector of the City of Pittsburg. With the exception of the PG&E Power Plant west of downtown, all of Pittsburg's heavy industrial uses are in Northeast River (Pittsburg 1998). Other industrial uses in the immediate vicinity include a petroleum coke handling facility, power plant and steel mill (see **LAND USE Figure 1**). Historically, manufacturing has been the foundation of Pittsburg's economy. In fact, Pittsburg got its name in honor of the American birthplace of the steel industry after Columbia Geneva Steel Company opened the first steel mill there in 1911. But, industry in Pittsburg is in a state of decline. The percentage of city residents employed in manufacturing has dropped from 21 percent in 1980 to 13 percent in 1990 (Pittsburg, 1998). The 1988 General Plan envisions the future of industry in Pittsburg as one of change—a move away from heavy industrial towards light-industrial and research and development facilities. However, the Plan states that

"whatever shape and course Pittsburg's industry takes in the future, the city probably has more than sufficient industrial land to meet its future needs."

Although the PDEF site is in Pittsburg, the project also will affect the City of Antioch and the County of Contra Costa. Portions of the power plant's linear facilities (water and natural gas supply pipelines and electrical transmission line) are located within the city limits of Antioch and the unincorporated area of the County.

SITE AND VICINITY DESCRIPTION

The proposed power plant will occupy 12 acres of an undeveloped 93.95-acre parcel owned by USS-POSCO. The Assessor's Parcel Number (APN) is 073-030-12. The project site borders on East 3rd Street, which runs along the northern boundary of the parcel. The site is designated General Industry (IG) on the City of Pittsburg General Plan Land Use Map. The IG land-use classification is defined to include "large areas of major industrial manufacturing uses, including the existing operations such as USS-POSCO (formerly U.S. Steel) and Dow Chemical." The site is zoned General Industrial (IG) District (see **LAND USE Figure 2**). The Pittsburg Zoning Ordinance states that the purpose of the IG District is:

> To provide sites for the full range of manufacturing, industrial processing, general service, and distribution uses deemed suitable for location in Pittsburg; and to protect Pittsburg's general industrial areas, to the extent feasible, from disruption and competition for space from unrelated retail and commercial uses that could more appropriately be located elsewhere in the city. Performance standards will minimize potential environmental impacts.

A portion of APN 073-030-12 to the southwest of the PDEF site is zoned Limited Industrial (IL). The IL zoning designation for this portion originates from when it was a separate parcel before being assembled by USS-POSCO (Jerome 1999, pers. comm.). The Pittsburg Zoning Ordinance states that the purpose of the IL District is: "To provide opportunities for smaller or less adverse manufacturing and industrial service uses, as well as related business and commercial services on typically limited size sites adjacent to general industrial uses." Land uses and zoning in the vicinity of the PDEF site are as follows:

Insert LAND USE FIGURE 1

Insert LAND USE FIGURE 2

- North / Northwest – Immediately north of the PDEF site and across East 3rd Street is the Pittsburg Marine Terminal (PMT) petroleum coke handling facility and GWF Power Plant No.1. Zoning is General Industrial. To the north of these facilities are New York Slough and Browns Island. To the northwest of, but not contiguous with, the PDEF site is Limited Industrial zoning. To the west of these parcels is the Bay Harbor Park residential subdivision. Residences on East 3rd Street and Riverway Drive are about 1,800 feet from the northwest corner of the site (PDEF 1998a).

- West – To the west of the PDEF site are Service Commercial (CS) uses. The Pittsburg Zoning Ordinance states that the purpose of the CS District is "to provide opportunities for retail and service businesses on transitional sites between commercial and industrial areas, including businesses not allowed in other commercial districts because they have industrial characteristics, require heavy vehicle or truck traffic, or have certain other adverse impacts." To the west of and adjacent to these land uses is Johns Manville Products Company, zoned IG. To the west of and adjacent to Johns Manville is the Village at New York Landing residential subdivision.

- South / Southwest – South of the PDEF site and across Santa Fe Avenue is the Central Addition residential neighborhood. These residences are about 2,000 feet from the southern boundary of the site (PDEF 1998a). About 1,300 feet from the southwest corner of the PDEF site is the residential area at Harbor and East 8th Streets. These houses will be the closest residences to the proposed power plant (PDEF 1998a).

- East – Immediately east of the PDEF parcel is the USS-POSCO steel mill. East of USS-POSCO is Dow Chemicals. Zoning is General Industrial.

TRANSMISSION FACILITIES

Alternate 115 kV Transmission Line (Route 1) – This alternate overhead transmission line for connection to the electrical grid is located entirely on USS-POSCO property. Sections of this new line will parallel existing transmission lines. Zoning is IG.

Alternate 115 kV Transmission Line to USS-POSCO (Route 2) – This alternative route for delivering electricity to USS-POSCO would travel south along Columbia Street before turning east at the Sacramento Northern, Atchison Topeka and Santa Fe railroad right-of-way. Sections of this new line will parallel existing transmission lines. Route 2 is located entirely on USS-POSCO property on land zoned IG.

Proposed 115 kV Transmission Line (Route 10) – The proposed 115 kV transmission line for connection to the electrical grid exits the PDEF switchyard as an overhead line, running southwest to the east side of Harbor Street at 8th Street. A transition station (needed for transitioning an overhead line to an underground line or vice versa) is proposed at this location. This aboveground segment of Route 10 traverses undeveloped land zoned IG and IL. From here the line will travel west underground in the median of 8th Street (the abandoned Sacramento Northern

railroad right-of-way). The area traversed by this segment of Route 10 is within the Downtown Specific Plan. Zoning designations are Duplex Residential (R-2), Multiple Family Residential (R-3), Residential Semi-Commercial (R-4), and Central Commercial (C-2). Route 10 resurfaces as an overhead line northwest of the West 8th Street – Beacon Street intersection. Based on information provided by the applicant, the transition station and overhead portion of the line would appear to be located north of the abandoned railroad right-of-way (Patch 1998c; see **LAND USE Figure 3**). At this point the transmission line is within the unincorporated area of Contra Costa County. The railroad right-of-way is designated Public/Semi-Public (PS) on the County General Plan Land Use Map. The County General Plan states that the PS designation includes "privately owned transportation and utility corridors such as railroads, PG&E lines, and pipelines." It is zoned Heavy Industrial (H-I) and subject to a special Railroad Corridor Combining District. From the transition station the transmission line travels northwest across H-I zoned land on its way to the PG&E Pittsburg Power Plant Substation.

Alternate Segment to the Proposed 115 kV Transmission Line (Route 10A) – After emerging as an overhead line northwest of the West 8th Street – Beacon Street intersection, Route 10A would continue the transmission line further west along the abandoned Sacramento Northern railroad right-of-way. It would travel within the railroad ROW for nearly 0.5 miles before turning northeast to follow a major transmission line corridor into the PG&E power plant. Route 10A is located entirely within the unincorporated area of Contra Costa County on H-I zoned land, some of which (abandoned railroad ROW) is subject to the Railroad Corridor Combining District.

Proposed 115 kV Transmission Line to USS-POSCO (Route 11) – The proposed route for delivering electricity to USS-POSCO will take the transmission line south from the PDEF, just west of the construction laydown area. Route 11 will then turn east (south of the laydown area) and run toward Columbia Street. From here it follows the same path as Route 2. Route 11 is located entirely on USS-POSCO property on land zoned IG.

WATER SUPPLY PIPELINES

Reclaimed Water Supply and Wastewater Return Pipelines (Route 4) – These underground pipelines connect the PDEF to the Delta Diablo Wastewater Treatment Facility (DDWTF) in the City of Antioch. The first 2.5 miles of Route 4 are located in Pittsburg on land zoned IG. The final 1,500 feet of Route 4 is located in Antioch on land zoned Planned Industrial District (M-1). These pipelines travel south from the PDEF following the alignment of an existing 60 kV transmission line and turn east at the Pittsburg-Antioch Highway. They travel along the north side of the highway (in the road right-of-way) to the DDWTF.

Insert LAND USE FIGURE 3

Alternate Reclaimed Water Supply and Wastewater Return Pipelines (Route 5) – Route 5 is a 2.9-mile long alternative route for connection to the DDWTF. Route 5 is located almost entirely within the City of Pittsburg. Zoning for lands the pipeline would occupy in Pittsburg is IG. The final 1,500 feet of Route 5 is located in Antioch on land zoned Planned Industrial District (M-1). Route 5 follows the same path as Route 4 as it leaves the PDEF before turning east to parallel the Sacramento Northern, Atchison Topeka and Santa Fe railroad for over 1 mile. Route 5 then turns south, travelling along a PG&E right-of-way for an existing 115 kV transmission line until it reaches the Pittsburg-Antioch Highway. From here Route 5 follows the highway to the DDWTF.

Proposed Sanitary Sewer and Potable Water Lines (Route 7) – About 0.02 miles long, Route 7 will connect the PDEF to an existing sanitary sewer line and an existing water main located adjacent to the northwest corner of the proposed PDEF site on East 3rd Street. Route 7 is located primarily on USS-POSCO property. The Pittsburg zoning designation for this area is IG.

Alternate Pipeline Corridor (Routes 11 and 12) – These are alternate pipeline corridors for the portions of Routes 4, 5, and 6 that run down Columbia Street. Both are located on USS-POSCO property south of the PDEF site.

NATURAL GAS SUPPLY PIPELINE

Proposed Fuel Gas Pipeline (Route 6) – This is a 3.8-mile long underground natural gas pipeline linking the PDEF with an existing PG&E 30-in. fuel gas line located in Buchanan Road in Antioch. Route 6 follows the same path as Route 5 until reaching the Pittsburg-Antioch Highway. From the highway the proposed gas pipeline continues south for about 0.75 miles along the PG&E 115 kV transmission line right-of-way, before turning east to follow an existing PG&E 26-in. gas pipeline right-of-way. As Route 6 turns east it crosses into Antioch. For another 0.75 miles Route 6 follows the PG&E right-of-way, which is being utilized as the East Bay Regional Park District Delta DeAnza Trail (a paved path for bicycling and walking), before turning southeast to connect with the PG&E gas line in Buchanan Road.

OTHER LINEAR FACILITIES

Proposed Steam Pipeline (Route 3) – This is a 0.6-mile long aboveground pipeline extending from the PDEF to USS-POSCO's boiler plant. Route 3 is located entirely on USS-POSCO property on land zoned IG.

Proposed Storm Drain Discharge (Route 8) – Storm water from the PDEF site will be discharged through an existing 24-in. storm drain pipe which exits the site at the northeastern side, crosses East 3rd Street and discharges to New York Slough.

TRUCK BYPASS ROAD

To facilitate access to the PDEF site, a new two-lane road will be built connecting the Pittsburg-Antioch Highway with Harbor Street. Starting about 300 feet east of the intersection of the highway and Columbia Street, the truck bypass road will parallel an existing PG&E easement that runs behind the first row of homes on

Columbia Street. Construction of this section of the roadway will require relocation of the Central Park baseball field about 190 feet east of the new road. Near the intersection of Columbia Street and East Santa Fe Avenue, the truck bypass road will curve west and run parallel to East Santa Fe Avenue on vacant land between the street and the railroad tracks, joining Harbor Street at a new signalized intersection. A 12-foot sound wall will be constructed between the truck bypass road and homes in the Central Addition neighborhood. Landscaping will be installed between the road and sound wall. Pittsburg zoning designations for land this new roadway will occupy are Governmental and Quasipublic (GQ), IG and IL.

IMPACTS

According to Appendix G of the Guidelines to the California Environmental Quality Act (CEQA), a criterion for evaluating whether a project will have a significant effect on land use is whether it will conflict with any applicable land use plans, policies or regulations. The laws ordinances, regulations, standards (LORS) and policies cited earlier in this staff assessment have been analyzed below to determine the project's compliance with these provisions. This is often referred to as a "consistency" analysis because its intent is to determine the extent to which the project is consistent or at variance with each requirement or standard.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

THE DELTA PROTECTION ACT OF 1992

The entire project is located in the Delta Secondary Zone and, thus, no part of the proposed project will encroach upon land within the Delta Primary Zone. The Delta regional plan does not supersede the authority of local governments over areas within the Secondary Zone. Therefore, the Act does not apply to the project.

PITTSBURG GENERAL PLAN

Land Use Element

The project is consistent with policy 2.8A because it would be located in the Northeast River industrial area and use of the site for power generation is consistent with its General Industry land use designation. It is consistent with policy 2.8B because the project will supply an existing industrial facility, USS-POSCO, with its need for electricity and steam. Although not "employment-intensive" as encouraged by Policy 2.8C, the City of Pittsburg will receive 60 percent of any project profits as part of a development agreement between the developer and the City.

Public Facilities, Institutions, and Utilities Element

The proposed transmission line (Route 10) will be consistent with 5.3J because it will be underground in the median of 8th Street.

Traffic and Circulation Element

The truck bypass road is consistent with 6.3D because it serves the intent of this policy to divert truck traffic from residential areas.

PITTSBURG ZONING ORDINANCE

Section 18.54.010: Power plants are normally a conditional use in General Industrial Districts. Since the issuance of a certificate by the Energy Commission is in lieu of any local permit (Pub. Resources Code, § 25500), a conditional use permit will not be required. However, conditions that Pittsburg would have required absent the Energy Commission's authority over the power plant will be incorporated into staff's conditions of certification. Staff has requested this information from Pittsburg in a formal data request (CEC 1998y). No response has been received at this time; therefore Pittsburg's concerns will be reflected in staff's supplemental testimony filed on April 12, 1999.

Section 18.54.015: The PDEF's heat recovery steam generator (HRSG) stacks (150 feet) and the auxiliary boiler stack (100 feet) exceed the maximum height allowed (50 feet) within the IG District. Even with the additional height allowance provided by section 18.54.100 the HRSG stacks would still surpass the height restriction by 75 feet. The project is not consistent with this zoning requirement.

At a data request workshop staff held in Pittsburg on February 9, 1999, the City of Pittsburg stated that a variance would be required to bring the project into compliance with the zoning ordinance. At the time of the workshop, the applicant had not filed the required variance application with the City of Pittsburg. The granting of a variance is a public process that can take up to 8 weeks. Section 18.16.050 of the zoning ordinance requires the city to make all of the following findings before allowing a variance from a zoning requirement:

1. Because of special circumstances concerning the subject property including size, shape, topography, location or surroundings, the strict application of the zoning regulations deprives the property of privileges enjoyed by other properties in the vicinity and in the same land use district.

2. The variance will not constitute a grant of special privilege which is not generally available to other property in the vicinity and in the same land use district.

3. The variance substantially complies with the intent and purpose of the land use district to which the property is classified.

4. In the case of a variance from open space regulations, the grant of a variance is consistent with Government Code section 65911 and will not conflict with general plan policies governing orderly growth and development and the preservation and conservation of open space lands.

The City of Pittsburg tentatively plans to use the Committee's Presiding Member's Proposed Decision (PMPD) as its environmental document for processing the variance request (CEC 1999, pers. comm.). The PMPD is scheduled for release on June 14, 1999. Pittsburg believes it will be able to rule on the variance and complete the public review process before the Energy Commission adopts its final decision on July 28, 1999. Until Pittsburg makes its final decision, staff cannot recommend a finding of conformity pursuant to Public Resources Code section 25525.

Section 18.54.020: The applicant has not supplied a site plan with sufficient detail (pursuant to section 18.36.200) to determine compliance with the design review requirement. Compliance with section 18.54.020 would be ensured by proposed condition **LAND-1** (see Conditions of Certification).

Chapter 18.78: The applicant has not supplied a site plan with sufficient detail (pursuant to section 18.36.200) to determine compliance with off-street parking and loading space requirements. Compliance with applicable requirements in Chapter 18.78 would be ensured by proposed condition **LAND-1** (see Conditions of Certification).

Section 18.80.030: The City of Pittsburg interprets this section to apply to the PDEF even though it is arguably not a "public utility" (Gangapuram 1999, pers. comm.). Therefore, the various transmission facilities are an allowed use in all zoning districts in which they are proposed to be sited and not subject to a height restriction. Because the proposed transmission line (Route 10) traverses a residential district, it would ordinarily require a conditional use permit. The Energy Commission's authority over all project-related linear facilities supersedes this requirement. However, conditions that Pittsburg would have required absent the Energy Commission's jurisdiction will be incorporated into staff's conditions of certification. Staff has requested this information from Pittsburg in a formal data request (CEC 1998y). No response has been received at this time; therefore Pittsburg's concerns will be reflected in staff's supplemental testimony filed on April 12, 1999.

Antioch General Plan

The project's water supply and gas supply pipelines are consistent with Policy 5 of the Community Character Goal because they will be underground. The gas pipeline is consistent with Policy 6 of the Community Design Goal because the Delta DeAnza trail, which a portion of the pipeline follows, will be continued as a pedestrian and bike trail. Policy 3 of the Health and Safety Goal requires new pipelines carrying hazardous materials to avoid residential areas "to the greatest extent possible." Although the gas pipeline follows existing utility corridors, including the Delta DeAnza trail that contains an existing 26-in. gas pipeline and a

water pipeline, it would pass through a residential area in Antioch. Please refer to the **FACILITY DESIGN** section of the Staff Assessment for a discussion of potential impacts associated with the gas pipeline and proposed condition **MECH-5** to ensure that the pipeline is installed and operated safely.

Antioch Zoning Ordinance

The City of Antioch ordinarily would require a conditional use permit for a natural gas pipeline (Carniglia 1999, pers. comm.). The Energy Commission's authority over all project-related linear facilities supersedes this requirement. However, conditions that Antioch would have required absent the Energy Commission's jurisdiction will be incorporated into staff's conditions of certification. The Antioch Zoning Ordinance requires that "new pipelines and other channels carrying hazardous materials shall avoid residential areas and other immobile populations to the greatest extent possible." A portion of the pipeline is proposed to be located in the Delta DeAnza Trail (an established utility corridor) which is adjacent to a residential area. Antioch would normally implement this zoning requirement through its conditional use permit process (Carniglia 1999, pers. comm.). On March 4, 1999 staff received a letter from the City of Antioch stating its concerns with the proposed gas pipeline, but time did not allow for these concerns to be fully addressed in staff's testimony. Staff will address comments received from Antioch in supplemental testimony filed on April 12, 1999.

Contra Costa General Plan

Based on information supplied by the applicant (Patch 1998c and represented here as **LAND USE Figure 3**) it would appear that the proposed transmission line (Route 10) is consistent with policies in the Transportation and Circulation Element concerning existing railroad rights-of-way. The General Plan acknowledges the use of railroad rights-of-way as utility corridors. Based on information available, the transmission line would not preclude future use of the abandoned railroad corridor (Sacramento Northern) "for trails or other public purposes" because it would be underground. Because the transition station would be sited outside of the right-of-way, it also would not prevent the future use of the corridor for trails or other public purposes. However, staff recognizes that the sketch for the transition station is not to scale and that once a final facility design is complete, this sketch may no longer apply. To address concerns raised by staff and Contra Costa County (Contra Costa County 1999) regarding potential impacts of transmission facilities on the Sacramento Northern railroad right-of-way, staff has proposed a condition of certification (**LAND-2**) that requires the applicant to avoid such impacts.

Contra Costa Zoning Ordinance

The portion of the abandoned railroad right-of-way within the County's jurisdiction is subject to the Railroad Corridor Combining District overlay zone. The overlay zoning prohibits the establishment of any new land uses or structures within the railroad right-of-way without first obtaining a conditional use permit. The Energy Commission's authority over all project-related linear facilities supersedes this requirement. In a letter to staff (Contra Costa County 1999), the County requested that the Energy Commission's analysis of the PDEF "consider the opportunity costs of committing the right-of-way to electrical transmission uses and foregoing other

possible future corridor uses such as transit line." The letter also states that "if the opportunity costs cannot be altogether avoided, perhaps they can be minimized by appropriate site planning." Staff's proposed condition **LAND-2** would ensure that the transition station would avoid any impacts or conflicts with the existing railroad right-of-way or preclude future use of this corridor as prescribed in the County General Plan.

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

In assessing potential land use impacts, staff makes a determination of the proposal's compatibility with existing and planned land uses. Compatibility refers to how well a project "fits" into an established community. A project may be incompatible with surrounding land uses if: 1) it introduces a use that is out of character with existing uses; 2) it may stimulate or change existing land ownership and development pattern; or 3) it may affect an area so negatively that existing uses are likely to abandon the area. In determining compatibility, staff also looks to Appendix G of the CEQA Guidelines for guidance. According to Appendix G, a criterion for evaluating whether a project will have a significant effect on land use is whether it will physically divide an established community.

PROPOSED GENERAL PLAN UPDATE

Pittsburg's current General Plan identifies the Northeast River area, the location of the proposed power plant, as a "special management area" for which a specific plan should be prepared. The General Plan states that "this designation recognizes that there are coexisting residential and industrial uses with special needs which require evaluation for future development." A specific plan for Northeast River has not been prepared (Gangapuram 1999, pers. comm.).

In September 1997, the City began the process to update its General Plan. In June 1998, it published the *Pittsburg General Plan Update: Existing Conditions and Planning Issues*. As its title suggests, the document describes preliminary planning issues for the General Plan update. Energy Commission staff recognizes that this report will be used as a basis for preparing alternative land use and transportation plans, policy-making for the General Plan, and the environmental setting portion of the Environmental Impact Report on the General Plan. It should be stressed that this report does not contain any adopted policies or specific plan and physical development proposals, but only serves to begin the discussion on key planning issues which will continue to be discussed and debated throughout the update process[1.] Of relevance to the PDEF, the report states that there is "inadequate" buffering between industrial facilities and residential neighborhoods and "in particular, the industrial Northeast River area transitions abruptly to downtown neighborhoods at Harbor Street" (Pittsburg 1998). It recommends that the General Plan update investigate what types of buffers would provide the needed transition between residential and industrial areas. Thus, resolution of this issue is beyond the scope of staff's PDEF analysis. Absent any adopted policies or ordinances for a

1 Pittsburg expects to complete the process of updating its General Plan within a year from now (Jerome 1999).

buffer in this area, staff's analysis will rely on current General Plan policies and zoning requirements.

Power Plant

Other heavy industrial land uses, as well as service commercial uses are in the immediate vicinity of the power plant site. Thus, the proposed facility is compatible with the industrial character of the immediate surrounding land uses. The power plant would occupy 12 acres of an approximately 94-acre parcel (APN 073-030-12). The currently undeveloped parcel is mostly designated General Industrial on both the Pittsburg General Plan Land Use and Zoning maps. A portion of the parcel is designated Limited Industrial, but no part of the PDEF site is within this zoning district. The project is consistent with the purpose of these designations and would not constitute a change in the current development pattern of the area (as established by the General Plan). Staff agrees with the applicant's assertion that the project represents "further development of an area committed to industrial use rather than the introduction of industry to a non-industrial area" (PDEF 1998a).

No residential uses adjoin the power plant site. The nearest residences (Harbor and East 8th Street) are about 1,300 feet from the site and separated from the power plant by the undeveloped portion of APN 073-030-12 designated for limited industrial use. Residential uses to the northwest (Bay Harbor Park) and west (Village at New York Landing) are separated from the proposed power plant by existing service commercial and industrial uses. A 12-foot sound wall, being constructed as part of the truck bypass road will provide buffering for residences to the south (Central Addition) of the site. Residential uses could be further buffered from the power plant if Pittsburg develops policies in the General Plan update that attempt to resolve—through landscaping, parks and/or transitional land uses—what Pittsburg has identified as "inadequate" buffering between industrial facilities and residential neighborhoods.

Transmission Lines

Transmission line routes 1, 2 and 11 are compatible with existing and planned land uses. Although these are aboveground lines, they will not physically divide any established community. These transmission lines are located entirely on USS-POSCO property and will follow, for the most part, existing utility corridors.

The proposed 115 kV transmission line (Route 10) will be compatible with existing and planned land use in Pittsburg. The transmission line will be placed underground in the median of 8th Street between Harbor and Montezuma Streets and will not conflict with existing or planned residential uses. (A 120-lot single-family residential subdivision, called Marina Walk, is being considered for a large vacant area bounded by Marina Boulevard, West 8th Street, Herb White Way, and buildings along Railroad Avenue.) Nor will the underground transmission line conflict with the proposed conversion of the 8th Street median into a linear park (Pittsburg 1998). Although the transition station at 8th Street, just east of Harbor Street would seem to be consistent with Pittsburg zoning ordinance section 18.80.030 allowing transmission facilities in any zoning district (land is undeveloped and zoned Limited Industrial), Energy Commission staff has identified that it has the

potential to cause a significant visual impact due to its close proximity to residential. Please refer to the **VISUAL RESOURCES** section for a more complete discussion.

Based on information provided by the applicant (Patch 1998c and represented here as **LAND USE FIGURE 3**) it would appear that the overhead portion of the transmission line and the second transition station would be outside of the abandoned railroad right-of-way (former Sacramento Northern) on land zoned for Heavy Industrial use. A letter received from Contra Costa County states that the Energy Commission's review of the project should "consider the opportunity costs of committing the right-of-way to electrical transmission uses and foregoing other possible future corridor uses such as transit line," although the letter is not aware of any transportation plans for this corridor (Contra Costa County 1999). In addition, staff's **TRAFFIC AND TRANSPORTATION** analysis did not identify the abandoned Sacramento Northern railroad right-of-way as a corridor for future Bay Area Rapid Transit expansion. Staff's proposed condition **LAND-2** would ensure that the transition station would not conflict with any future use of this right-of-way for "trails and other public purposes" (as identified in the Contra Costa County General Plan). Also, please refer to the **VISUAL RESOURCES** section for a discussion about the transition station's potential to cause significant visual impacts.

Route 10A, an alternate segment to Route 10, may potentially be incompatible with future use of the abandoned railroad right-of-way. The applicant has not provided a detailed site plan for Route 10A so staff is uncertain if the transition station will be sited in the same location as it is for Route 10 or in an alternate spot. A diagram supplied by the applicant shows the footprint of the transition station to be 50 feet by 90 feet (see **TRANSMISSION SYSTEM ENGINEERING FIGURE 2**). If sited within the railroad right-of-way, the transition station has the potential to preclude use of the right-of-way for "trails and other public purposes" (as identified in the Contra Costa County General Plan).

WATER SUPPLY LINES

Staff does not expect these linear facilities (Routes 4, 5 and 7) to cause a significant land use impact because they will not physically divide any established community. These water lines are proposed to be underground and will follow existing utility corridors and road or railroad rights-of-way.

NATURAL GAS SUPPLY PIPELINE

Staff does not anticipate the natural gas pipeline to cause a significant land use impact because it will not physically divide any established community. It is proposed to be underground for its entire length and will follow existing utility corridors and a railroad right-of-way. While in the Delta DeAnza trail, an established utility corridor containing an existing 26-in. gas pipeline and a water pipeline, it would pass through a residential area in Antioch. Please refer to the **FACILITY DESIGN** section of the Staff Assessment for a discussion of potential impacts associated with the gas pipeline and proposed condition **MECH-5** to ensure that the pipeline is installed and operated safely.

TRUCK BYPASS ROAD

Staff does not expect the truck bypass road to cause a significant land use impact. The purpose of this new road is to divert truck traffic from residential and commercial areas. The truck bypass road will not physically divide the Central Addition residential neighborhood because it is proposed to be located along its eastern and northern boundaries. Construction of the roadway will not displace any houses, but will necessitate the relocation of the baseball diamond. It will be relocated east of the new road to an unused portion of the same parcel. An elevated crossing structure will facilitate pedestrian access to the baseball field. A 12-foot sound wall will provide a buffer between the new roadway and residences on Columbia Street and East Santa Fe Avenue.

The proposed truck bypass road will change existing land use on three parcels. Lands that will be converted to public right-of-way include vacant property owned by USS-POSCO and designated for industrial use, the land currently occupied by the baseball field and designated governmental/quasi-public, and vacant land adjacent to East Santa Fe Avenue and designated open space. The applicant will acquire the necessary easements from the landowners (PDEF 1998a). According to the applicant, the land use changes will not require a General Plan or zoning ordinance amendment because the Final Environmental Impact Report (FEIR) for the truck route found it consistent with the General Plan. Staff has requested in a Data Request to the City of Pittsburg for confirmation of the applicant's statement (CEC 1998y). A response has not been received. As mitigation for the truck route, the FEIR states that land adjacent to the new road and Santa Fe Avenue and Columbia Street should include provisions for landscaping and irrigation. The FEIR identifies these same areas as the site of a future linear park (Pittsburg 1992). Staff has requested confirmation from the City of Pittsburg that the applicant's proposed landscaping plan for land between the truck route and Santa Fe Avenue and Columbia Street is consistent with park development (CEC 1998y). Outstanding information expected from Pittsburg will be reflected in supplemental testimony to be filed April 12, 1999.

CUMULATIVE IMPACTS

Cumulative impacts may be caused if a project would have effects that are individually limited but cumulatively considerable when viewed together with the effects of related projects. In December 1998, Energy Commission staff began its review of a second power plant proposed for construction in Pittsburg (98-AFC-3). The Delta Energy Center, as it is called, would be an 880-megawatt cogeneration power plant and would be located adjacent to the Delta Diablo Sanitation District facility on Arcy Lane, north of State Route 4. The Delta Energy Center (DEC) 230 kV transmission line also would travel underground within the median of 8th Street to connect to the electrical grid at the PG&E Pittsburg Power Plant. The underground duct bank housing the PDEF transmission line will be 23 feet wide and the DEC duct bank will be 33 feet wide. Engineering practice requires at least 15 feet between the two duct banks. The easement running through the 8th Street median is 50 feet wide. Essentially the current easement allows room for only one transmission facility. More than likely this would be PDEF's transmission line since their Application for Certification was filed with the Energy Commission 6 months

earlier than the DEC's. To accommodate the second transmission line, permission would need to be granted from the City of Pittsburg for encroachment into the 8th Street right-of-way. Staff is uncertain at this time how Pittsburg will handle this situation if both power plants are granted a license from the Energy Commission.

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The information provided in the AFC did not specifically address the effects of project closure on land use issues and concerns. The proposed PDEF is expected to be in operation in excess of thirty years. The applicant will prepare a Facility Closure Plan for submittal to the Energy Commission for review and approval, at least twelve months prior to the proposed closure. At the time of closure, all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with.

There are at least two other circumstances under which a facility closure can occur, unexpected temporary closure and unexpected permanent closure. In the event of temporary facility closure, staff has not identified any LORS from a land use perspective with which the applicant would have to comply. In the event of unexpected permanent closure and dismantling of the facility, the applicant would need to comply with the Antioch zoning requirement concerning pipelines no longer in use as stated in the LORS section of the land use analysis.

MITIGATION

The project will not comply with all applicable laws, ordinances, regulations and standards because the project will exceed Pittsburg's 75-foot height restriction on structures in a General Industrial zoning district. The applicant seeks to resolve the nonconformity by applying for a variance from the City of Pittsburg. Until such variance is granted, staff cannot recommend a consistency finding pursuant to Public Resources Code Section 25525. If the variance is ultimately granted, staff does not expect any significant adverse impacts to land use. Thus, staff proposes no land use-specific mitigation measures.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

If the applicant is granted a variance from the City of Pittsburg to exceed the 75-foot height restriction on structures in a General Industrial zoning district, as well as complies with proposed condition **LAND-1**, the project will be in conformance with applicable laws, ordinances, regulations and standards. The proposed power plant will be compatible with existing and planned land uses because: 1) it is consistent

with the current general plan and zoning designations of property; 2) it is compatible with the heavy industrial character of the immediate land uses; 3) the site does not abut any residential areas; and 4) distance and/or other structures will provide buffering for residential uses in the vicinity.[2] The project's linear facilities also will be compatible with existing and planned land uses because they will, for the most part, follow existing utility corridors or rights-of-way. In addition, the gas and water pipelines, as well as the portion of the proposed transmission line travelling through a residential area will be underground. Proposed condition **LAND-2** will ensure that the transition station at West 8th Street would be compatible with future use of the abandoned (Sacramento Northern) railroad corridor. Therefore, based on information available at this time staff does not anticipate any significant land use impacts.

RECOMMENDATION

If the Energy Commission certifies the PDEF, staff recommends that the Commission adopt the following proposed conditions of certification. Staff anticipates that the cities of Pittsburg and Antioch and Contra Costa County will provide additional comments and information that will need to be reflected in supplemental testimony.

CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall comply with Pittsburg Zoning Ordinance section 18.36.210 (Design Review) and applicable requirements in Chapter 18.78 (Off-street Parking and Loading). The project owner shall submit a site plan (as required by section 18.36.210) to both the California Energy Commission Compliance Project Manager (CPM) and the City of Pittsburg prior to the start of construction.

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the Energy Commission CPM a site plan which provides the information required for Design Review (including a statement that the project conforms to the applicable off-street parking and loading requirements). The project owner shall also submit the site plan to the City of Pittsburg for comments, and provide a copy of those comments with the plan submitted to the CPM.

LAND-2 The transition station at West 8th Street shall be designed and constructed in such a way as to avoid any impacts or conflicts with the existing railroad right-of-way (Sacramento Northern) or preclude the use of this right-of-way from any future use as prescribed in the Contra Costa County General Plan.

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the Energy Commission CPM a site plan, at a reasonable scale, that

2 Residential uses could be further buffered from the power plant if the updated Pittsburg General Plan contains policies that provide for buffers, such as landscaping, parks and/or transitional land uses, between industrial facilities in Northeast River and residential neighborhoods.

shows the exact location of the transition station and describes any measures taken to ensure that it will not impact the existing railroad right-of-way (Sacramento Northern) or preclude the use of this right-of-way from any future use as prescribed in the Contra Costa County General Plan. The project owner also shall submit the site plan to Contra Costa County Community Development Department for review and provide any County comments with the site plan submitted to the Energy Commission CPM.

REFERENCES

Antioch General Plan, December 1988.

Antioch Zoning Ordinance, November 1994.

Carniglia, Victor. 1999. Deputy Director, Planning, City of Antioch. Telephone conversation with Eric Knight (California Energy Commission), February 9 and 26.

Cited in text as: (Carniglia 1999, pers. comm.)

CEC (California Energy Commission/White) 1998y. CEC staff data request, Pittsburg District Energy Facility (98-AFC-1). Submitted to Jeffrey C. Kolin, City of Pittsburg, January 26, 1999.

Cited in text as: (CEC 1998y)

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TRAFFIC AND TRANSPORTATION

Testimony of David Flores

INTRODUCTION

The Traffic and Transportation section of the Final Staff Assessment (FSA) addresses the extent to which the project may impact the transportation system within the vicinity of its proposed location. This section summarizes the separate analyses by both the applicant for Pittsburg District Energy Facility (PDEF) and the Energy Commission staff of the potential traffic and transportation impacts associated with construction and operation of the project. These analyses included the identification of: 1) the roads and routings which are proposed to be used; 2) potential traffic related problems associated with those routes; 3) the anticipated number of trips to deliver oversize/overweight equipment; 4) the anticipated encroachment upon public right-of-ways during the construction of the proposed project and associated appurtenant facilities; 5) the frequency of trips and probable routes associated with the delivery of hazardous materials; and 6) the availability of alternative transportation methods such as rail.

Staff used this information to determine the potential for the project to have significant traffic and transportation impacts, as well as to assess the availability of mitigation measures which could reduce or eliminate the significance of those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable laws, ordinances, regulations and standards.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

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

- Title 49, Code of Federal Regulations, Section 171-177, governs the transportation of hazardous materials, the type of materials defined as hazardous, and the marking of the transportation vehicles.

- Title 49, Code of Federal Regulations, Section 350-399, and Appendices A-G, Federal Motor Carrier Regulations, addresses safety considerations for the transport of goods, materials, and substances over public highways.

STATE

The California Vehicle Code and Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and right-of-way. In addition, the California Health and Safety Code

addresses the transportation of hazardous materials. Specifically, these codes include:

- California Vehicle Code, section 353, defines hazardous materials. California Vehicle Code, sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.

- California Vehicle Code, section 31030, requires that permit applications shall identify the commercial shipping routes they propose to utilize for particular waste streams.

- California Vehicle Code, sections 31600-31620, regulates the transportation of explosive materials.

- California Vehicle Code, sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.

- California Vehicle Code, sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.

- California Vehicle Code, sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.

- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.4, 34501.10, 34505.5-7, 34507.5 and 34510-11, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials.

- California Vehicle Code, sections 2500-2505, authorizes the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives.

- California Vehicle Code, sections 13369, 15275 and 15278, addresses the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, these sections require the possession of certificates permitting the operation of vehicles transporting hazardous materials.

- California Streets and Highways Code, sections 117 and 660-72, and California Vehicle Code 35780 et seq., require permits for the transportation of oversized loads on county roads.

- California Streets and Highways Code, sections 660, 670, 1450, 1460. et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachment on state and county roads.

- California Health and Safety Code, sections 25160 et seq., addresses the safe transport of hazardous materials

LOCAL

CITY OF PITTSBURG

The Traffic and Circulation Element of the City of Pittsburg General Plan sets up standards for traffic service and roadway improvements. It introduces planning tools essential for achieving the local transportation goals and policies (City of Pittsburg, 1988). Specific policies from the Traffic and Circulation Element that directly relate to this project include:

- Construct an east-west arterial collector system to serve the industrial areas east of downtown.

- Discourage through traffic on local roadways.

- Designate truck routes, and discourage unnecessary through-traffic in residential areas through construction system design and planning.

- Maximize the carrying capacity of arterial roadways by controlling the number of intersections and driveways and minimize residential access.

CITY OF ANTIOCH

The Streets and Highway Goals of the City of Antioch General Plan set standards to provide adequate capacity to, from and within the City to achieve acceptable operations on all roadways and all intersections.

Although the majority of the proposed project and linear facilities are located in Pittsburg, some linear facilities (reclaimed water line [s] and fuel gas pipelines) cross into the jurisdiction of the City of Antioch in two locations: 1) north of the Pittsburg- Antioch Highway at the entrance to the Delta Diablo Sanitation District Waste Water Treatment Plant and, 2) east of Los Medano Drive.

RAILROADS

The Union Pacific Railroad Company requires a Right of Entry Form for any work or testing on their property. Additional permitting would be required for a permanent right-of-way for any applicable utility crossings.

SETTING

REGIONAL DESCRIPTION

HIGHWAYS AND ROADWAYS

The proposed project is located in the northeast part of the City of Pittsburg, near the intersection of East 3rd and Columbia Streets. The City presently has two designated truck routes serving the industrial areas on 3rd Street. Both existing routes use Highway 4 and the Loveridge Road interchange. The first route uses California Avenue west to Harbor Street north to connect to 3rd Street. The second route uses Loveridge Road north to the Pittsburg-Antioch Highway, west to East 14th Street, west to Solari Street, north to East 10th Street, east to Harbor Street, and then north to connect to 3rd Street.

The Atchison, Topeka, Santa Fe and Union Pacific Railroads operate active main line and spur tracks within 0.5 mile of the project site. Inactive rail lines are within several hundred feet of the proposed site (See **TRAFFIC AND TRANSPORTATION Figure 1**).

IMPACTS

STANDARDS

SERVICE LEVEL STANDARDS

When evaluating a project's potential impact on the local transportation system, staff uses levels of service measurements as the foundation on which to base its analysis. Essentially levels of service (LOS) measurements represent the flow of traffic. In general, LOS ranges from A, free flowing traffic, to F, which is heavily congested with stoppage of the flow.

The General Plan (City of Pittsburg, 1988) adopted the following LOS policies on city streets:

TRAFFIC AND TRANSPORTATION Figure 1
Pittsburg District Energy Facility – Truck Route 1 & 2

1. Strive to maintain traffic LOS C or better as the standard at all intersections, with LOS D during no more than 3 hours of the day (a.m., p.m., and noon peaks).

2. Accept LOS D during 2-hour peak periods, with the possibility of intersections at or closely approximating the limits of LOS D, only on arterial routes bordered by nonresidential development where improvements to meet the City=s standard would be prohibitively costly or disruptive (City of Pittsburg, 1988).

The *Pittsburg Traffic Mitigation Fee Study* (Fehr & Peers Associates, 1997) utilized a mid LOS D (volume to capacity ratio = 0.85) as the peak hour signalized intersection standard for identifying significant impacts. This standard is consistent with the standards established in the *Technical Procedures (for Analysis of Growth)*, Contra Costa Transportation Authority, 1998 Update.

EXISTING LEVEL OF SERVICE

Evaluation of existing LOS=s consist of p.m. peak hour analysis at the nine key intersections along the primary project access route. Consistent with the assumption that the Truck Bypass Road will be in place, several new intersections or revisions to intersection control are assumed and were evaluated specifically:

- traffic signal at USS-POSCO entrance and Pittsburg-Antioch Highway intersection;
- new signalized intersection at East 14th Street and Truck Bypass Road;
- traffic signal at Harbor Street and Santa Fe Avenue intersection; and
- traffic signal at Harbor and East 3rd Street intersection.

All of the existing and new intersections as part of the Truck Bypass Road and associated improvements will operate at LOS B or better, except at the intersection of Loveridge/Pittsburg-Antioch Highway, which operates at LOS D. This intersection, with a volume to capacity ratio of 0.82, borders on exceeding the City=s service level standard (0.85).

The existing and new unsignalized intersections along the Truck Bypass Road will operate at LOS B during the p.m. peak hour, well under the adopted standard of LOS E for any approach of an unsignalized intersection.

PUBLIC TRANSPORTATION

Bay Area Rapid Transit (BART) provides service to the recently opened Bay Point Station located west of the City of Pittsburg. Future planned transit expansions include the extension of BART to Antioch along the Highway 4 corridor (Kathy Mayo/BART transit planner). Tri-Delta Transit provides fixed route bus service from

the Bay Point BART station and the entire east county, which serves the project area. Tri-Delta routes No. 380 and 392 serve Harbor Street near the East 10th Street, within walking distance of the project area.

Accident Analysis

Traffic accident records for the past three years (1995-1997) were reviewed and compared with statewide average accident rates to determine if any of the primary access roads experience unusually high numbers of accidents. The data provided by PDEF=s consultant reflect the primary access routes to the power plant site have accident rates well below the statewide average for similar types of roadways. None of the recorded accidents occurred at railroad crossings. This level of accident history does not indicate any unusual hazard or improperly designed facilities along these roads. (PDEF 1998, AFC page 5.11-19)

Construction Phase

Commute Traffic

On December 7, 1998, the applicant amended its application to reflect a minor relocation of the reclaimed water supply and wastewater return lines into the Pittsburg-Antioch Highway. This will occur between Columbia Street and Loveridge Road. In addition a new 115 kV transmission line has been included in the amendment. This route will be constructed in an underground duct bank along the median of 8th Street (currently an abandoned railroad right of way), traversing several cross streets along the way. The impacts associated with this amended construction activity are reflected in this report.

The power plant is to be constructed on a 12-acre site within the existing property currently owned and controlled by USS-POSCO Industries. An additional 20 acres adjacent to and south of the plant site will be utilized as a temporary construction laydown area and for contractor employee parking. The construction schedule requires about 20 months to complete the project with onsite construction manpower, plus staff, having a 9 month peak of an estimated 299 workers starting in the 14th month after the notice to proceed. The construction layout area, adjacent to the site, will provide sufficient parking space for these workers. Additional offsite linear facility construction workers will range between 10 and 17 per day for 8 of the 9 major months. The labor force trip generation is 100 percent directional with 90 persons arriving at the site in the morning and departing the site in the afternoon. Consistent with the analysis of the peak construction labor force period, 70 percent of the initial construction labor force is assumed to arrive or depart in the 30 minute period prior to the area=s commute peak hour, with the remaining 30 percent arriving or departing within the commute peak hour. The existing commute peak hours in this area are 7:00 to 8:00 a.m. and 4:30 to 5:30 p.m. **TRAFFIC AND TRANSPORTATION Figure 2** shows the estimated power plant site morning and afternoon peak hour trip generations for labor forces and trucks.

Truck Traffic

Construction truck deliveries of equipment and materials peak during month 4 through 6 of the construction schedule, as the site is prepared. At the same time, construction truck traffic is estimated at 935 truck deliveries per month in the two-month initial construction period. This is equivalent to about 44 trucks entering and exiting the site per day. The construction labor at the end of these 2 months reaches 85 persons, about 32 percent of the full construction force. Therefore, for the purposes of evaluating worst-case traffic impacts, these elements analyze the combined truck and labor force peak in months 11 through 15 of the construction schedule. During this peak, the project will generate about 150 truck deliveries per month. This coincides with the peak month of the labor force and is the equivalent of 7 truck deliveries per day or 14 inbound plus outbound truck trips per day. Truck trips carrying construction material are assumed to be evenly distributed throughout the day.

Rail Line

As shown on the attached **TRAFFIC AND TRANSPORTATION Figure 1**, an existing Union Pacific railroad spur is within close proximity of the project site. PDEF has indicated that they currently have no specific plans to use the rail spur to deliver equipment. If economically feasible over trucking, the railroad spur could be utilized to deliver large equipment such as the combustion turbines. Staff for purposes of analysis, assume truck deliveries of equipment and materials.

Traffic and Transportation - Figure 2
Onsite Vehicle and Truck Trip Table

LINEAR FACILITIES

Construction of the 115 kV transmission line along 8th Street can cause some disruption of traffic due to the transport of construction materials and transmission equipment and the actual construction near roadways.

Construction of this aboveground/below ground transmission line will involve less than 9 worker vehicles and trucks. It is currently planned that underground construction along the 8th Street median will be done by boring under major streets, Railroad Avenue and Harbor Street, therefore not impacting their traffic. North-south residential streets crossing 8th Street are expected to be closed in groups of 3 for up to three days at a time as duct bank construction progresses down 8th Street. Sufficient parking for construction vehicles is available in this area. The maximum traffic impact will be associated with short-term detours of residential vehicles several blocks at a time for three days. Each of these construction activities will have short-term and minimal impacts on the function of area roadways. Use of typical signals, or warnings will also notify motorist of construction activity.

Construction of the reclaimed water supply and wastewater discharge lines along the Pittsburg-Antioch Highway may be limited by several utilities that are already buried in both shoulders. These existing utilities are not well documented as to their precise location. As a result, between the southern end of the new Truck Bypass Road and Loveridge Road, installation of some sections of these pipelines may encroach within the highway. Traffic in the morning and afternoon peak periods is near capacity on this section of the highway (e.g., 948 vehicles per hour westbound between 7 and 8 AM; opposing direction traffic in the 5 to 6 PM peak is 63 percent of the peak direction). Flagmen directing traffic during these hours could back traffic up into the Loveridge Road intersection in the AM or into town in the PM peak.

However, traffic on the Pittsburg-Antioch Highway between 9 AM and 2:30 PM, and after 7 PM are less than 500 vehicles total in both directions. It is expected that occasional flagged one-way traffic between 9 AM and 3 PM could be used without increasing traffic delays beyond those already incurred during the peak periods. These delays will occur at various times over the 2 to 4 weeks required for the installation of the pipelines between the Truck Bypass Road and Loveridge Roads. The applicant has committed to limit construction in this specific area to between 9 AM and 2:30 PM, or after 7 PM. With implementation of this mitigation measure, construction of the pipelines in this area would not be expected to produce a significant traffic impact.

TRUCK BYPASS ROAD

The Truck Bypass Road is proposed as part of the PDEF project to mitigate the adverse impacts of project-related truck traffic in the northwestern industrial area of Pittsburg and to divert trucks and vehicular traffic from 3rd and Harbor Streets to the Pittsburg-Antioch Highway and its connection to Highway 4 via Loveridge Road. The proposed Truck Bypass Road would also mitigate existing truck traffic impacts in the area. The northwestern industrial area of Pittsburg generates substantial

vehicle and truck traffic, which currently passes through residential and commercial areas on the designated truck routes. The new truck route utilizes the Pittsburg-Antioch Highway until east of the intersection with residential Columbia Street where a new street is to be constructed parallel to Columbia Street and Santa Fe Street, connecting to Harbor Street north of the residential areas. The truck route utilizes the northern section of Harbor Street connecting to East 3rd Street where it provides access to industrial uses. In addition to the truck bypass road, an elevated pedestrian cross walk will be built near the intersection of East 14th Street. Additionally, the road will be constructed to Caltrans and City standards and will incorporate the use of a soundwall 12 feet in height. The proposed truck route is shown on **TRAFFIC AND TRANSPORTATION Figure 3**.

Operational Phase

Commute Traffic

Operation of the completed power plant is estimated to have a permanent labor force of 20 persons and 2 trucks per day (10 per week) delivering and removing materials and supplies. This will not present any major traffic problems.

The project will generate the need to transport hazardous materials and wastes during construction and operations. During operations of the project, the delivery of chemicals and the removal of wastes are expected to generate less than 10 trucks ingressing and egressing the site per week. Examples of the types of hazardous materials delivered to the site include aqueous ammonia, sulfuric acid, sodium hydroxide, and fluids required for plant operations. Aqueous ammonia, designated a California extremely hazardous material, would be transported to the site in 8,000-gallon tankers on an average of once every 4 days (a total of 87 trips per year). The handling and disposal of hazardous substances are addressed in the Waste Management Section of this preliminary staff assessment. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances. Conditions of certification that insure this compliance are discussed under their respective subsection later in this analysis.

CUMULATIVE IMPACTS

The PDEF, as part of an overall development, will add to cumulative traffic loads in the local area. Construction traffic generated by the project would potentially impact residential and commercial areas if it were to use existing streets and designated truck routes to access the power plant site. Without the Truck Bypass Road, labor force vehicles, delivery trucks, and heavy equipment would utilize the Pittsburg-Antioch Highway to Columbia Street to access the site. The southerly half of Columbia Street is within a residential district with single-family homes fronting onto the street. Key considerations then will be the transport of hazardous materials. The **Conditions of Certification** section of this report will ensure that

TRAFFIC AND TRANSPORTATION Figure 3
Proposed Truck Routes

the transport of such materials is undertaken in compliance with applicable federal and state laws.

The only other project proposed in the area is the Delta Energy Center, an 880-megawatt (MW) combined cycle facility to be located east of the proposed Pittsburg Plant on Arcy Lane. During construction of the PDEF, no cumulative impacts on traffic are expected for the following reasons:

- Peak construction traffic at the PDEF will occur before peak construction traffic at the Delta Energy Center begins.

- Traffic for the PDEF will not use the same access roads used by Delta Energy Center. Delta Energy Center will likely use Somersville Road turn-off from Highway 4, west on Pittsburg-Antioch Highway, and north on Arcy Lane to the project site. PDEF will utilize Loveridge Road turn-off from Highway 4, west on Pittsburg-Antioch Highway, northwest on the newly constructed Bypass Road to Harbor Street, north on Harbor Street to 3rd Street and east on 3rd to the project site.

After both facilities are constructed, they will both operate 7 days a week, 24 hours per day. The Delta Energy Facility will likely use the same number of operating personnel as the PDEF (approximately 20 people) Monday through Friday of each week. As explained earlier in this report, this small number of commuters will not significantly impact traffic.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

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

STATE

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

LOCAL

For operational employees, trip reduction measures could be employed. But since the maximum number of employees assigned to any one shift is 20, trip reduction measures for this project will have an insignificant impact on congestion increases resulting from operation of the power plant. However, operational traffic could be considered for such a program depending upon the eventual cumulative impacts from the full buildout of the industrial area.

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.

The information provided in the AFC did not specifically address the effects of project closure on traffic and transportation issues and concerns. The proposed PDEF is expected to be in operation in excess of thirty years. The applicant will prepare a Facility Closure Plan for submittal to the Energy Commission for review and approval, at least twelve months prior to the proposed closure. At the time of closure, all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with.

There are at least two other circumstances under which a facility closure can occur, unexpected temporary closure and unexpected permanent closure. Provisions must be made to address these specific situations. From the perspective of traffic and transportation issues, in the event of temporary facility closure, the applicant would have to comply with all applicable policies contained in the LORS section of this report in respect to transportation permits for hazardous materials and equipment deliveries and removal.

In the event of unexpected permanent closure, staff assumes that the facility will either remain idle until such time that new ownership is established, or dismantling of the facility will occur. In any event, LORS requirements as stated in this report will be adhered to for the owner to secure applicable transportation permits.

As discussed earlier in the report, certain roadway improvements are anticipated to be completed over a period of years (including the Bypass Road) which will lower the City of Pittsburg's level of service at various major roadways. In the event of temporary or permanent closure, the roadway systems within the vicinity of the project should be able to handle construction traffic without affecting the current level of service of the area (LOS C during normal daytime traffic and LOS D during peak hour traffic).

MITIGATION

The CEQA Guidelines (Title 14, California Code of Regulations, section 15370) defines mitigation to include:

a) Avoiding the impact altogether by not taking a certain action or parts of an action.

b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.

d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

e) Compensating for the impact by replacing or providing substitute resources or environments.

APPLICANT'S PROPOSED MITIGATION

SPECIFIC MITIGATION MEASURES

The applicant has proposed two mitigation measures to reduce traffic impacts:

- A Truck Bypass Road will be constructed to divert trucks and vehicular traffic away from existing residential and commercial districts along Harbor Street. (TRANS-1 Condition)

- Construction of the reclaimed water supply and wastewater discharge lines along the Pittsburg-Antioch Highway shall be limited to specific timeframes for construction to reduce peak traffic impacts.

EFFECTIVENESS OF THE APPLICANT'S PROPOSED MITIGATION MEASURES

The applicant's proposed mitigation measures will act to reduce the potential significance of traffic impacts associated with the generation project. Extensions of these measures and other measures, as proposed below by Energy Commission staff, will ensure that traffic impacts will be minimized.

STAFF'S PROPOSED ADDITIONAL MITIGATION

A specific truck traffic route will need to be utilized until such time that the Truck Bypass Road is completed. This will reduce traffic impacts to portions of the existing residential and commercial districts along Harbor Street. (**See TRANS-2**)

A specific traffic control plan is needed to assure safety measures are in place during construction of the power plant, pipelines, and linear facilities. This will also assist local law enforcement and emergency services of possible closures of roadways due to construction. (**See TRANS-6**)

In addition, the applicant shall develop a road maintenance and repair mitigation plan with the City of Pittsburg or any other affected jurisdictions in which accelerated road wear occurs as a result of project traffic. (**See TRANS-7**)

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes the following based on the independent analysis of the proposed PDEF:

POWER PLANT

1. Adverse impacts of project-related truck traffic will be mitigated by the construction of the Truck Bypass Road which construction personnel and materials and equipment delivery trucks will be mandated to use.

2. Until such time that the Truck Bypass Road is completed, adverse impacts of project-related truck traffic will be mitigated by the requirement to utilize a designated truck route.

3. During the operational phase, with the Truck Bypass Road in place, increased roadway demand resulting from the daily movement of workers and materials will be minimal.

4. All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances.

LINEAR FACILITIES

1. Construction of the transmission lines will have minimal impacts on the function of area roadways. Routine construction safety measures should be sufficient to ensure no impacts.

2. Because construction requires trenching within public road rights-of-way, the installation of underground facilities will impact both roadway function and levels of service. However, these impacts are expected to be short-term and not result in significant traffic and transportation impacts. The applicant has indicated their intent to provide appropriate traffic control measures, and these are contained within the conditions of certification. In addition, all development will take place in compliance with California Department of Transportation and City of Pittsburg limitations for encroachment into public rights-of-way.

Based on staff's conclusions, if the proposed mitigation measures are properly implemented, no significant traffic impacts are likely to occur. Further, if the conditions of certification proposed by staff are observed and properly implemented, the PDEF will be in compliance with applicable laws, ordinances, regulations, and standards.

Staff recommends that if the Energy Commission certifies the PDEF, that it adopt the following proposed Conditions of Certification.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall construct the Truck Bypass Road between the Pittsburg-Antioch Highway and Harbor Street and it shall be completed within 2 months after construction of the PDEF project begins.

Verification: In Monthly Compliance Reports, the project owner shall submit progress reports with estimates for completion of the Truck Bypass Road.

TRANS-2 Until the Truck Bypass Road project is completed, the project owner shall require that all truck traffic utilize the existing designated truck route: Loveridge Road interchange from Highway 4, California Avenue, Harbor Street and 3rd Street to access the site.

Verification: The project owner shall include this specific route in its contracts for truck deliveries and shall report any noncompliance and any corrective measures taken to ensure future compliance in the Monthly Compliance Reports.

TRANS-3 The project owner shall comply with California Department of Transportation (Caltrans) and the City of Pittsburg limitations on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

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

TRANS-4 The project owner or its contractor shall comply with Caltrans and the City of Pittsburg limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In Monthly Compliance Reports, the project owner shall submit copies of any encroachment permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-5 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed.

Verification: The project owner shall include in its monthly compliance reports, copies of all shipping manifests related to hazardous material shipments.

TRANS-6 Prior to the start of construction, the project owner shall consult with the City of Pittsburg and will prepare a construction traffic control plan and implementation program which address the following issues:

- timing of heavy equipment and building materials;

- signing, lighting and traffic control device placement;
- establishing construction work hours outside of peak traffic periods;
- emergency access;
- temporary travel lane closures;
- maintaining access to adjacent residential and commercial property and;
- off street employee parking in construction areas during peak construction.

Verification: At least 30 days prior to start of construction, the project owner shall provide to the CPM for review and approval, a copy of its construction traffic control plan and implementation program.

TRANS-7 Following construction of the power plant and all related facilities, the project owner shall meet with the CPM and Contra Costa County to determine the actions necessary and schedule to complete the repair of all roadways to original or as near original condition as possible.

Protocol: At least thirty days prior to start of construction, the project owner shall photograph the primary routes to be used by construction traffic (from 10th Street, north along Harbor Street, east on 3rd Street to project site). Those areas that will be affected by pipeline construction (at Pittsburg-Antioch Highway between the Truck Bypass Road and Loveridge Road shall also be photographed). The project owner shall provide the CPM and Contra Costa County with a copy of these photographs.

Verification: Within 30 days of the completion of project construction, the project owner shall meet with the CPM and City of Pittsburg. The project owner shall provide a copy of a letter from the City of Pittsburg and Caltrans acknowledging satisfactory completion of the roadway repairs in the first Annual Compliance Report following start of operation of the PDEF.

TRANS-8 Construction of the reclaimed water supply and wastewater discharge lines along the Pittsburg-Antioch Highway between the Truck Bypass Road and Loveridge Road shall be committed to limit construction in this specific area from 9 AM to 2:30 PM, or after 7 PM.

Verification: At least 30 days prior to start of construction activities in this specific area, the project owner shall in the Monthly Compliance Reports to the CPM, report on the use of the above measures in the construction of the underground pipelines. This condition shall be reflected in the construction traffic

control plan and implementation program. The Monthly Compliance Reports shall also identify any alternative measures that were used to minimize impacts on the Pittsburg-Antioch Highway.

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NOISE

Testimony of Steve Baker

INTRODUCTION

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

The purpose of this analysis is to identify and examine the likely noise impacts from the Pittsburg District Energy Facility (PDEF); and to recommend procedures to ensure that the resulting noise impacts will comply with applicable laws and ordinances, and will be adequately mitigated.

Before certifying the PDEF, the Energy Commission must find that:

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

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C.A. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration has adopted regulations (29 C.F.R. § 1910 et seq.) that establish maximum noise levels to which workers at a facility may be exposed. These OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time during which the worker is exposed. (Please see **Noise: Appendix A, Table A4** immediately following this section.) OSHA regulations also dictate hearing conservation program requirements and workplace noise monitoring requirements.

There are no federal laws governing offsite (community) noise.

STATE

Similarly, there are no state regulations governing offsite noise. Rather, state planning law (Gov. Code, § 65302) requires that local authorities such as counties or cities prepare and adopt a general plan. Government Code section 65302(g) requires that a noise element be prepared as part of the general plan to establish acceptable noise limits. Other state LORS include CEQA and Cal-OSHA.

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. The CEQA Guidelines (Cal. Code Regs., tit. 14, Appendix G) explain that a significant effect from noise may exist if a project would result in:

"a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

"b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

"c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

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

Cal-OSHA

The California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, § 5095 et seq.) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards described above.

LOCAL

The PDEF will lie in a heavily industrialized area near the northern edge of the City of Pittsburg. A portion of the electric interconnection line will pass through unincorporated portions of Contra Costa County, while portions of the fuel gas line, reclaimed water supply line and wastewater return line will lie within the City of Antioch (PDEF 1998a, 1998k).

City of Pittsburg General Plan Noise Element

The General Plan Noise Element identifies those noise levels compatible for community noise environments (Pittsburg 1988, Table 10-1). For all normal sensitive noise receptors (residences, schools, hospitals, libraries and places of worship), round-the-clock exposure levels up to 60 dBA (L_{dn} or CNEL)[1] are deemed normally acceptable, and levels up to 70 dBA are conditionally acceptable. The Noise Element further addresses increases in noise levels in existing community environments, stating that "[i]ncreases of more than 5 dB are significant and can generate adverse community response in residential areas." The Noise Element goes on to list several "Guiding Policies," including:

1 For definitions of these and other noise measurement terms, please refer to **Noise: Appendix A** immediately following this section.

"A. Minimize vehicular and stationary noise sources, and noise emanating from temporary activities."

The Pittsburg General Plan Update, now in the adoption process, reiterates the criteria that "[a] 5 dB change [in noise] is often considered a significant impact..." and "...maximum noise levels of 60 dB are considered 'normally acceptable' for unshielded residential development" (Pittsburg 1998). It further points out that "[n]oise descriptors used for analysis need to account for human sensitivity to nighttime noise." The Update also identifies several issues, including:

"15-1 Minimizing sources of noise. Before considering ways to protect uses from noise, an effort should be made to minimize noise at its source."

City of Pittsburg Noise Ordinance

The Noise Ordinance (Pittsburg 1974) begins with the following statement:

"9.44.010 Prohibitions. It is unlawful for any person to make, continue or cause to be made or continued any noise which either unreasonably annoys, disturbs, injures or endangers the comfort, repose, health, peace or safety of others...." Specifically included in this category are:

"G. Steam Whistles...attached to any stationary boiler....

"H. Exhausts...of any...stationary internal combustion engine....

"J. Pile Drivers, Hammers and Similar Equipment. The operation between the hours of ten (10) p.m. and seven (7) a.m. of any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist or other appliance, the use of which is attended by loud or unusual noise, except in case of emergency....

"K. Blowers...unless the noise from such blower or fan is muffled...sufficient to deaden such noise...."

Contra Costa County General Plan Noise Element

Two policies enunciated in this noise element (Contra Costa 1996) impact the construction and operation of a project such as the PDEF. Policy 11-1 requires that new projects meet the exterior noise level standards established in the Noise and Land Use Compatibility Guidelines. The Guidelines specify that noise levels up to 60 dBA L_{dn} or CNEL are normally acceptable at residential receptors such as single family homes. Policy 11-8 requires that construction activities should take place during the normal work hours of the day to provide relative quiet during evening and morning periods.

City of Antioch General Plan Noise Goal

The Noise Goal encompasses several relevant policies (Antioch 1988). Policy 1 delineates land use compatibility guidelines that consider noise levels at single family residential receptors up to 60 dBA L_{dn} or CNEL as normally acceptable. Policy 7, which would apply to construction of the PDEF, requires that the impact of

noise sources be minimized, if possible, by limiting them to the daytime hours, defined as 7:00 a.m. to 7:00 p.m. Policy 11 limits the background ambient noise level for outdoor living areas, defined as backyards for single family homes, to 60 dBA CNEL.

City of Antioch Zoning Ordinance

Article 19 of this ordinance (Antioch 1994) states that uses adjacent to single family homes shall not cause an increase in background ambient noise that exceeds 60 dBA CNEL.

SETTING

The PDEF will be located on a twelve acre site in the northwest portion of the USS-POSCO Industries property in Pittsburg. This is in an industrial neighborhood, bordered on the northwest by the PMT petroleum coke handling facility, on the northeast by the GWF power plant, on the southeast by the USS-POSCO steel mill, on the east by the Dow Chemical Company plant, and on the west by the Johns Manville facility (PDEF 1998a, AFC §§ 1.3.1, 3.2.1). The nearest sensitive noise receptors are residences, located approximately 1,800 feet to the southwest along Harbor Street; 2,000 feet to the south, south of Santa Fe Avenue; and 3,000 feet to the west in Bay Harbor Park (PDEF 1998a, AFC § 5.12.1.1.1).

In order to predict the likely noise effects of the PDEF on the surrounding community, the applicant performed an ambient noise survey of the area near the project site. The noise survey is acceptable to staff, as it was performed by a qualified consultant using typical monitoring and analysis equipment and methods (PDEF 1998a, AFC § 5.12.1.3).

The applicant's noise survey monitored noise levels at ten locations, including five near residences and five surrounding the project site itself (PDEF 1998a, AFC § 5.12.1.3, Table 5.12-1, Figure 5.12-1; Greene 1998, pers. comm.). The nearest residential site, referred to in the application for certification (AFC) as Ambient Noise Measurement Location 10, was monitored continuously for a 25-hour period; the remaining sites were spot monitored at various times throughout the day. While the AFC presented the noise regime at Ambient Noise Measurement Location 10 in terms of a 24-hour average (PDEF 1998a, AFC Table 5.12-2), the applicant's response to staff's subsequent data request (PDEF 1998b, Table NOISE-1) displayed the data in terms of one-hour averages. The results of the survey showed noise levels typical of an industrial neighborhood, with noise levels as high as 66 to 69 dBA L_{eq} during the daytime, dropping as low as 51 dBA L_{eq} at night (PDEF 1998a, AFC Table 5.12-3; PDEF 1998b, Table NOISE-1).

IMPACTS

Project noise impacts can be created by construction and by normal operation of the power plant.

PROJECT SPECIFIC IMPACTS — CONSTRUCTION

Community Effects

Construction noise is a temporary phenomenon; the PDEF construction period is scheduled to last from 18 to 20 months (PDEF 1998a, AFC §§ 1.4, 3.7). Construction of an industrial facility such as a power plant is typically and unavoidably noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempted from enforcement by local ordinances. The applicable law, the City of Pittsburg Noise Ordinance, allows high noise levels during the daytime, but prohibits exceptionally noisy construction work between the hours of 10 p.m. and 7 a.m. (Pittsburg 1974, § 9.44.010 J).

The applicant has predicted the noise impacts of project construction on the nearest sensitive receptors (PDEF 1998a, AFC §§ 5.12.2.2, 5.12.2.4, 5.12.2.6, 5.12.2.8; Tables 5.12-5, 5.12-6). Construction noise levels (other than pile driving and steam blows) are predicted to drop to ambient noise levels at a distance of less than 1,000 feet from the site (PDEF 1998a, AFC § 5.12.2.2). Note that this prediction is based on assumed noise levels produced by typical construction equipment; these assumed levels are taken from figures published in 1977. Today's construction equipment is, however, somewhat quieter than that in use in 1977. The applicant's predicted construction noise levels are thus expected to be conservative, that is, higher than should be actually experienced. Further, in calculating noise levels at receptors, the applicant has not considered the barrier effects of existing structures between the noise source and the receptors in estimating noise level attenuation (PDEF 1998a, AFC § 5.12.1.5). In actuality, noise levels will be slightly lower than predicted, lending more conservatism to the estimates.

To further reduce annoyance, general construction activities will be performed between the hours of 6 a.m. and 6 p.m.. Noisy construction activities such as pile driving and jack hammering will not be performed during the hours of 10 p.m. to 7 a.m. (in accordance with the City of Pittsburg Noise Ordinance), making them least likely to disturb the project's neighbors (PDEF 1998a, AFC § 5.12.2.2). Staff expects that construction noise will present no significant adverse impacts. In the event that construction noise does present a problem, staff has recommended a procedure (see proposed Conditions of Certification Noise-1 and Noise-2, below) to ensure that parties disturbed by this noise can seek correction of the problems.

Steam Blows

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

In order to prevent this, before connecting the steam system to the turbine, the steam line is temporarily routed to the atmosphere. Steam is then raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system piping. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet; this would be exceedingly disturbing at the nearest residence. In order to minimize disturbance from steam blows, staff recommends that mufflers be installed on the steam blow piping, and that such blows be restricted to certain daytime hours (see proposed Condition of Certification Noise-4 below).

Alternatively, the applicant may elect to employ a new, quieter steam blow process, variously referred to as QuietBlow™ or Silentsteam™. This method utilizes lower pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet; noise levels at the nearest residences should not exceed the ambient noise level. This should not significantly disrupt the project's neighbors. Staff proposes a notification process (see proposed Condition of Certification Noise-5 below) to make neighbors aware of impending steam blows; this should help render the process tolerable.

Linear Facilities

Construction of the gas line, water lines, transmission line and cogeneration steam line will produce noise. This noise will be noticeable, and possibly annoying, to persons outside their homes at those residences nearest the construction. This work, however, is only a temporary phenomenon; the work will progress at such a pace that no single receptor will be inconvenienced for more than a few days (PDEF 1998a, AFC §§ 5.12.2.4, 5.12.2.6, 5.12.2.8). In addition, such work must be performed during daytime, in accordance with applicable noise LORS, and would cause no impacts at night, when quiet is most important. For example, work within the City of Pittsburg is controlled by the Noise Ordinance, which limits use of noisy equipment such as "pile drivers, hammers and similar equipment" to the hours from 7:00 a.m. to 10:00 p.m. (Pittsburg 1974). For those portions of the transmission line lying in unincorporated land, construction activities will occur during the "normal work hours of the day," in accordance with the Contra Costa County General Plan Noise Element (Contra Costa 1996). The applicant has committed to restricting work here to the hours from 7:00 a.m. to 7:00 p.m. weekdays, and from 8:00 a.m. to 5:00 p.m. weekends (PDEF 1998k, § 5.12.4). Construction of the gas and water lines within the City of Antioch is restricted by the General Plan Noise Goal to the hours from 7:00 a.m. to 7:00 p.m. (Antioch 1988).

Staff has proposed a Condition of Certification (Noise-8, below) to restrict noisy construction work to the hours specified in the applicable LORS, above. Staff has further proposed a noise complaint process (Conditions of Certification Noise-1 and Noise-2, below) that will allow any person suffering annoyance to address the

problem with the project owner. With these restrictions in place, staff believes no significant adverse noise impacts are likely to occur due to construction of the linear facilities.

Worker Effects

The applicant recognizes the need to protect construction personnel from noise hazards, and commits to comply with all applicable LORS (PDEF 1998a, AFC §§ 5.12.4, 7.4.10). To ensure that workers are, in fact, adequately protected, staff has proposed a condition of certification (see proposed Condition of Certification Noise-3, below).

PROJECT SPECIFIC IMPACTS — OPERATION

Effect on Neighborhood Noise Environment

The PDEF will be constructed in a heavily industrial neighborhood. Ambient noise levels in such an environment typically are fairly high during the day, and significantly quieter at night, as industrial noise sources are shut down. This is demonstrated by the applicant's ambient noise monitoring (PDEF 1998b, Table NOISE-1), which shows daytime noise levels as much as 18 dBA (L_{eq}) above nighttime levels.[2]

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

Original Proposal

The applicant originally proposed to design and construct the PDEF so that it would contribute noise levels, at the nearest sensitive receptor (residences near Harbor Street at East 9th Street) of no more than 65 dBA L_{dn}. The reasoning was that this level, added to the existing ambient noise level of 68 dBA L_{dn}, would not increase total noise levels above 70 dBA, the maximum conditionally acceptable level as specified in the General Plan Noise Element (Pittsburg 1988). Further, this would not increase noise levels more than 5 dB above the existing ambient level. These figures were based upon daytime ambient noise readings at Ambient Noise Measurement Locations 1 through 9 (PDEF 1998a, AFC Table 5.12-3), and upon a 24-hour average of noise readings at Ambient Noise Measurement Location 10 (PDEF 1998a, AFC Table 5.12-2). Were it not for the greatly varying level of ambient noise between day and night, and for the fact that the PDEF will be expected to operate round the clock, this may have been an acceptable approach. In light of these circumstances, however, staff objected to this approach.

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2 From 51 to 69 dBA L_{eq}. An increase of 18 dB represents a near quadrupling of perceived noise level.

First, basing design on a 24-hour average of noise levels at the nearest sensitive receptor (Ambient Noise Measurement Location 10) tends to minimize the significant variation between daytime and nighttime ambient noise. Second, using L_{eq} or L_{dn} figures gives much weight to short-term noise, such as a car or truck passing by. As described above, the power plant, when operating, will act as a steady noise source, effectively increasing the background noise level. The power plant would thus represent a much more insistent, continuous addition to ambient noise levels, more noticeable at night. Because of this effect, staff believes it is more appropriate, in the instance of a baseload power plant near residences,[3] to compare power plant noise to the ambient background noise level, represented by L_{90}.[4]

Proposed Mitigation

The applicant's response to staff's concerns was to commit to significant noise reduction measures in the design of the facility. These measures would include, as required, incorporation of additional or upgraded silencers, enclosures, shields, shrouds, cladding and barriers around noise-producing features of the plant. The applicant also rotated the facility plot plan 180 degrees, placing the HRSG exhaust stacks further from the nearest sensitive receptors (PDEF 1998k, § 5.12.2).

The result of incorporating these noise reduction measures is shown on the revised Power Plant Operational Noise map (PDEF 1998k, Fig. 5.12-2), which shows a noise contour from plant operation intersecting the nearest sensitive receptors at a level of 47 dBA L_{eq}. As the lowest nighttime L_{90} values measured at the nearest sensitive receptors were 45 dBA, adding 47 dB to this level would result in a new noise level of 49 dBA. This represents an increase of only four dB from the existing L_{90} level, less than the criterion of five dB expressed in the Pittsburg Noise Element (Pittsburg 1988). The design committed to in the Supplement to the AFC (PDEF 1998k, § 5.12) will thus result in an insignificant increase in noise levels at any sensitive receptors. Staff has proposed measures (see proposed Condition of Certification Noise-6, below) to ensure that the completed facility does, in fact, adhere to this noise limit.

Tonal and Intermittent Noises

One possible source of noise annoyance would be strong tonal noises, individual sounds that, while not louder than the permissible levels, stand out in sound quality. To ensure the avoidance of such tonal sound, the noise control design of the PDEF can be balanced to bring as many noise sources as possible to the same relative sound level, causing them all to blend without any one source standing out. Another potentially annoying source of noise from a combined cycle power plant is the intermittent or occasional actuation of steam relief valves. The hissing noise from these valves can be largely mitigated by the installation of adequate mufflers.

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3 Residences and hospitals represent sensitive receptors where people sleep, and are thus more sensitive to nighttime noise. Schools, libraries and places of worship are typically insensitive to nighttime noise.

4 The applicant acknowledges that L_{eq} applies generally to daytime noise, and not to nighttime noise (PDEF 1998a, AFC § 5.12.1.2).

To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff has proposed measures (see proposed Condition of Certification Noise-6, below) to ensure that tonal and intermittent steam relief noises are not allowed to cause a problem.

LINEAR FACILITIES

The linear facilities, once placed in operation, will likely produce no audible noise. The gas line will be silent from any distance. The cogeneration steam line to the USS-POSCO steel mill will be built above ground, but will be located entirely on USS-POSCO property (PDEF 1998, AFC § 5.12.2.5), and its thermal insulation will likely provide adequate muffling. The electric transmission line will normally be inaudible from any distance (PDEF 1998, AFC § 5.12.2.3). A humming from corona effect would occur in rainy or highly humid conditions, but would be practically unnoticeable, masked by traffic sounds and other ambient noises.

WORKER EFFECTS

The applicant recognizes the need to protect plant operating personnel from noise hazards, and commits to comply with all applicable LORS (PDEF 1998a, AFC §§ 5.12.4.2, 7.4.10). Administrative procedures and hearing protection measures will be put in place to ensure workers' hearing is adequately protected. Staff has proposed measures (see proposed Condition of Certification Noise-7, below) to ensure compliance.

CUMULATIVE IMPACTS

Requisite to any discussion of cumulative impacts are nearby projects existing or planned for the future. The applicant has identified any potential developments that may impact, or be impacted by, the PDEF (PDEF 1998, AFC § 5.18.2; Table 5.18-1; Figure 5.18-1; and PDEF 1998k, § 5.18). The Pittsburg Marine Terminal storage domes will be constructed, in part, concurrently with the PDEF. While simultaneous truck trips from the two construction efforts will increase truck traffic on area roadways, the intermittent nature of the noise from this traffic is such that any cumulative impacts will be negligible. The PDEF's Truck Bypass Road should not cause operating noise impacts that cumulatively affect or are affected by the PDEF. The Marina Walk development, 8/10 mile to the west, is too far from the PDEF to produce or suffer from cumulative noise impacts. Any other developments, including Calpine's Delta Energy Center power plant project, are much too far from the PDEF site to possibly create any cumulative noise impacts. While construction of linear facilities from the Delta Energy Center project could conceivably produce minor cumulative impacts in relation to construction of the PDEF if such construction were to occur simultaneously, staff deems such impacts as speculative. Staff therefore concludes that the PDEF will not create any significant cumulative noise impacts.

FACILITY CLOSURE

Upon closure of the facility, all operational noise will cease; no further adverse impacts from operation will be possible. The remaining potential noise source will

be that caused by dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise will be similar to that caused by the original construction of the PDEF, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

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

RECOMMENDATIONS

Staff recommends that the following proposed Conditions of Certification be adopted to ensure compliance with all applicable noise LORS, and implementation of the applicant's and staff's proposed mitigation measures.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of rough grading, the project owner shall notify all residents within one mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report following the start of rough grading a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

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

Protocol: The project owner or authorized agent shall:

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

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

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

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

Verification: NOISE-4 If a traditional, high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 100 dBA measured at a distance of 100 feet. The project owner shall conduct steam blows only during the hours of 7:00 a.m. to 6:00 p.m. If a modern, low-pressure continuous steam blow process is employed, the project owner shall submit a description of this

NOISE COMPLAINT RESOLUTION FORM

PITTSBURG DISTRICT ENERGY FACILITY PROJECT
(98-AFC-1)

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

Final noise levels at 3 feet: _____ 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.)process, with expected noise levels and projected hours of execution, to the CPM.

At least 15 days prior to the first high-pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer, and a description of the steam blow schedule. At least 15 days prior to the first low-pressure continuous steam blow, the project owner shall submit to

the CPM drawings or other information describing the process, including the noise levels expected and the expected time schedule for execution of the process.

NOISE-5 The project owner shall conduct a public notification program to alert residents within one-half mile of the site prior to the start of steam blow activities. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: At least 15 days prior to the first steam blow(s), the project owner shall notify all residents within one-half mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. Within five (5) days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6 Upon the project first achieving an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. No single piece of equipment shall be allowed to stand out as a dominant source of noise that draws complaints. Steam relief valves shall be adequately muffled to preclude noise that draws complaints. If the results from the survey indicate that operation of the power plant causes noise levels in excess of 47 dBA (l_{eq}) measured at the property line of the nearest residence, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit. No single piece of equipment shall be allowed to stand out as a dominant source of noise.

Verification: Within 30 days after first achieving an output of 80 percent or greater of rated output, the project owner shall conduct the above described noise survey. Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the City of Pittsburg Planning Division and the CPM. Included in the report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within thirty (30) days after the facility is in full operation, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner

shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable 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 upon request.

NOISE-8 Noisy construction work shall be restricted to the times of day delineated below:

Within the Pittsburg City Limits:	7:00 a.m. to 10:00 p.m.
Within the Antioch City Limits:	7:00 a.m. to 7:00 p.m.
Within unincorporated areas of Contra Costa County:	7:00 a.m. to 7:00 p.m. weekdays, and 8:00 a.m. to 5:00 p.m. weekends

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

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FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

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

NOISE Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level L_{eq}	The average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L_{dn}	The Average A-Weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: California Department of Health Services 1976.

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

NOISE Table A2
Typical Environmental and Industry Sound Levels

Source and Given Distance from that Source	A-Weighted Sound Level in Decibels (dBA)	Environmental Noise	Subjectivity/ Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		
	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')			
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	Quiet
Large Transformer (200')	40		
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		
Source: Peterson and Gross 1974			

SUBJECTIVE RESPONSE TO NOISE

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

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

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

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

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

- Except under special conditions, a change in sound level of 1 dB cannot be perceived.
- Outside of the laboratory, a 3 dB change is considered a barely noticeable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

Combination of Sound Levels

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a 3-dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus 3 dB). The rules for decibel addition used in community noise prediction are:

NOISE Table A3
Addition of Decibel Values

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

Source: Thumann, Table 2.3

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

NOISE Table A4
OSHA Worker Noise Exposure Standards

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

Source: OSHA regulations

VISUAL RESOURCES

Testimony of Gary D. Walker

SUMMARY

Energy Commission staff analyzed both the potential visual impacts of the proposed project and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project's impacts on visual resources would be significant and that the project would not comply with applicable laws, ordinances, regulations, and standards.

INTRODUCTION

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

ORGANIZATION OF ENERGY COMMISSION STAFF'S ANALYSIS

This analysis:

- describes staff's analysis methodology;
- describes applicable laws, ordinances, regulations and standards;
- assesses the visual setting of the proposed power plant site and linear facility routes;
- evaluates the visual impacts of the proposed project on the existing setting;
- evaluates compliance of the project with applicable laws, ordinances, regulations, and standards; and
- recommends measures needed to mitigate any potential significant adverse impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards.

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

ENERGY COMMISSION STAFF'S ANALYSIS METHODOLOGY

Visual resources analysis has an inherent subjective aspect. However, the use of generally accepted criteria for determining impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

SIGNIFICANCE CRITERIA

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

STATE

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

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

a) have a substantial adverse effect on a scenic vista;

b) substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

c) substantially degrade the existing visual character or quality of the site and its surroundings; or

d) create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

LOCAL

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

PROFESSIONAL STANDARDS

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

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

- Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?

- Will the project eliminate or block views of valuable visual resources?

- Will the project result in significant amounts of backscatter light into the nighttime sky?

- Will the project be in conflict with directly-identified public preferences regarding visual resources?

- Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?

- Will the project result in a substantial visible exhaust plume?

Key Observation Points

Energy Commission staff selected Key Observation Points[2], or KOPs, to provide the basis for evaluation of project impacts by comparing the appearance before and after project construction. KOPs include locations that are chosen to be representative of the most critical locations from which the project would be seen.

Evaluation Process

For each KOP, Energy Commission staff considered the existing visual setting and the visual changes that the project would cause to determine impact significance. The applicant used Viewing Positions in the visual resources section of the application (PDEF 1998a) and supplement (PDEF 1998k). Energy Commission staff evaluated the appropriateness of these locations for its analysis. Staff generally agreed with the selection of locations, but requested that simulations be provided from two additional view locations (KOPs 2, not identified as a viewing position in the supplement, and KOP7, identified in the supplement) to address the visual impacts of the project as revised in the supplement.

Elements of the Visual Setting

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

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

[2] The use of KOPs or similar view locations is common in visual resource analysis. The US Bureau of Land Management and the US Forest Service use such an approach.

ranges from high, such as for a park or major water view, to low, such as for an area of heavy industry.

Visual Sensitivity - A measurement of the level of interest or concern of viewers regarding the visual resources in an area. Official statements of public values and goals reflect viewers' expectations regarding a visual setting. This analysis also employed land use as an indicator of viewer sensitivity. Uses associated with 1) designated parks, monuments, and wilderness areas, 2) scenic highways and corridors, 3) recreational areas, and 4) residential areas are highly sensitive. Commercial uses, including business parks, are generally moderately sensitive, with landscaping, building height limitations, and prohibition of above-ground utility lines demonstrating concern for visual quality. Large scale industrial uses are typically the least sensitive because workers are focused on their work, and generally are working in surroundings with relatively low visual value.

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

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

Types of Visual Change

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

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

Contrast – Visual contrast was evaluated in regard to the elements of color, form, line, and scale.[3] The degree of contrast can range from high to low.

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

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

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL AND STATE

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

LOCAL

The proposed power plant and most of the linear facilities would be located in the City of Pittsburg. A portion of two linear facilities would be in the City of Antioch. These include the southeastern terminus of the fuel gas pipeline (Route 6) and the reclaimed water pipeline segments near the Delta Diablo Sanitation District facility. The western section of the proposed transmission line to the PG&E Pittsburg Power Plant substation crosses land under the jurisdiction of Contra Costa County.

CITY OF PITTSBURG

GENERAL PLAN

Five policies within the City of Pittsburg General Plan (1988) are relevant to the project. Four are in the Land Use Element, and one is in the Parks and Recreation Element, as described below.

2. Land Use Element

2.1 Community Image

Guiding Policies

E. Preserve the feel of a city surrounded by open space, and preserve corridors to the hills and to the waterfront.

Implementing Policies

S. Make preservation of view corridors to the hills and to the waterfront a consideration in project and design review.

2.8 Industrial Development

Guiding Policies

D. Protect existing and new residential areas from adverse effects of new industry and, wherever feasible, of existing industry.

Implementing Policies

J. Adopt setback, landscaping, and screening requirements for industrial development to protect adjacent non-industrial uses.

4. Parks and Recreation Element

4.2 Park and Recreation Facilities, Planning and Management

Implementing Policies

N. Maintain view corridors for views of the river.

5. Public Facilities, Institutions, and Utilities Element

5.3 Utilities and Public Services

Guiding Policies

C. Require buffer landscaping and multiple use, where feasible, of utility sites and rights-of-way to harmonize with adjoining uses.

ZONING ORDINANCE

Pittsburg's zoning ordinance includes the following requirements related to visual resources.

Section 18.54.105: Required front and street side yards must be landscaped, except for access driveways, or be enclosed by a solid fence or wall at least 6 feet in height.

Section 18.80.035: This section requires that a refuse storage area located within a building or screened on three sides by a 6-foot high concrete or masonry wall and including a gate constructed to city design standards must be provided before occupancy for uses other than a single-family or duplex dwelling. The city planner may waive this screening requirement in the IG district for refuse collection and storage equipment, including a dumpster and waste storage container that is not visible from a public street.

Section 18.80.045: This section requires that signs erected on a site in any land use district to comply with the Sign Regulations (Title 19).

Section 18.82.045: This section requires that each exterior of a building or other structure must be kept in a good state of repair and the exterior finish must be clean and well maintained; and the entire site including paved, unpaved, and landscaped areas must be kept in a neat and orderly manner, free of weeds, loose trash, debris and other litter.

City of Antioch

General Plan

Only one goal in the City of Antioch General Plan (Antioch 1988) is relevant to the protection and enhancement of visual resources. Community Design Policy 2 states that "Views along utility easements should be retained and enhanced through the use of planting materials to frame and focus views and to provide a sense of orientation."

Contra Costa County

General Plan

The Contra Costa County General Plan (Contra Costa County 1991) contains the following policies and implementation measures that appear to apply to the proposed project.

Land Use Element

Policies

3-19 - Buffers shall be provided between new industrial developments and residential areas by establishing setbacks, and park-like landscaping or other appropriate mechanisms.

Implementation Measures

3-z - Initiate and enforce, if necessary, specific development standards for both proposed and existing businesses to achieve appropriate landscaping design and sign structures.

Open Space Element

Scenic Resource Policies

9.17 – New power lines shall be located parallel to existing lines in order to minimize their visual impact.

9.24 – The appearance of the County shall be improved by eliminating negative features such as non-conforming signs and overhead utility lines, and by encouraging aesthetically designed facilities with adequate setbacks and landscaping.

PROJECT DESCRIPTION

The following section describes the aspects of the project that may have the potential for significant visual impacts. These facilities include the power plant, the electrical transmission lines, the truck bypass road and its sound wall, the steam

line, the reclaimed water line, the sanitary sewer and potable water lines, and the storm drain discharge.

POWER PLANT

PROJECT DESCRIPTION Figure 3 shows an oblique view of the proposed power plant. **PROJECT DESCRIPTION Table 1** lists the dimensions of significant project structures and equipment. The most visually prominent elements of the power plant would be the two 70-foot-tall heat recovery steam generators; their 150-foot tall stacks, the steam turbines, inlet air filters, and cooling towers (ranging in height from 40 to 45 feet); and the switchyard (35 feet high). The color of the major project structures is assumed either to be gray or to be a color compatible with the surroundings that would be selected at a later date. Security fencing would be chain-link and be at a height determined by applicable codes and regulations. Details of exterior lighting will not be determined until the final design stage. However, to avoid excessive nighttime glare and backscatter, the applicant proposes that lighting shall be directed downward and be shielded (PDEF 1998a, p.5.13-3).

ELECTRIC TRANSMISSION LINE TO USS-POSCO

One proposed PDEF electric transmission line would be an approximately 1.2 mile long, single circuit, 115 kV line on 130 ft. tall steel lattice towers to two existing USS-POSCO substations (see **PROJECT DESCRIPTION Figure 4**, Route 11, between points AF-AJ-H-I-J-K). The first section of the route (AF-AJ-H runs south, then east, crossing open land with USS-POSCO slightly to the east (see **LAND USE Figure 1**). The route then turns southeast then east (H-I) and runs parallel to a railroad line with USS-POSCO on the north side, another factory on the south side, and residences to the southwest. The final portion of the route (I-J-K) runs north into the USS-POSCO steel mill.

ELECTRIC TRANSMISSION LINE TO PG&E PITTSBURG POWER PLANT SUBSTATION

The other proposed electric transmission line would be a two mile long double circuit, 115 kV line from the switchyard to a substation at the Pittsburg Power Plant (see **PROJECT DESCRIPTION Figure 4**, Route 10, between points AF-AG-AH-AE. The first segment of this line (AF-AG) would travel southwest approximately .one-quarter mile above ground, across open land with existing industrial facilities nearby on 150 foot tall steel lattice towers or poles to a new overhead/underground transitional facility near the corner of Harbor and 8th Streets**. TRANSMISSION SYSTEM ENGINEERING Figure 2** shows an elevation view of the transitional facility. The line would then run west underground beneath 8th Street past residences and an open area for approximately one mile to a second new transitional facility just north of the corner of Beacon and 8th Streets, at point AH. Residences are immediately south of the transition station site, while PG&E facilities are to the north. The line would then come above ground on 150-ft. tall steel poles or lattice towers and travel northwest across PG&E property near Marina Park for approximately 1600 feet to the Pittsburg Power Plant substation at point AE.

TRUCK BYPASS ROUTE

As part of the project, the applicant is proposing to construct a two-lane truck bypass road. The road would be approximately 0.75 mile long. It would run north from the Pittsburg-Antioch Highway to Santa Fe Avenue (see **PROJECT DESCRIPTION Figure 4**, Route 9, from point AA to point BB). The road would start at an intersection with the highway about 285 feet east of the centerline for Columbia Street and parallel Columbia Street for approximately 1,250 feet north before curving to the west to parallel East Santa Fe Avenue. A 12-foot-tall sound wall would be built along the west side of the new roadway where it parallels Columbia Street and the south side of the new roadway where it parallels Santa Fe Avenue (PDEF 1998a, p.5.13-7).

STEAM LINE

PROJECT DESCRIPTION Figure 4 shows the route of the proposed steam line to USS-POSCO's boiler plant: Route 3, between points A-B-C-D-E. The steam line would be installed above ground on existing and new pipe racks. However, the line would be entirely on USS-POSCO property. The highest portions of the line would be approximately 25 feet tall (PDEF 1998d, Data Response Visual-8 and 9). The closest portion of the line would be approximately 0.5 mile from the nearest residence or public street, and existing industrial structures, rail cars, trees, and terrain would block views. Because the steam line would not be visible from public areas, it would not cause any significant visual impacts, and it is not discussed further in this analysis.

RECLAIMED WATER SUPPLY LINE AND WASTEWATER RETURN LINE

ROUTE 4

PROJECT DESCRIPTION Figure 4 shows the proposed route for the reclaimed water line and wastewater return line: Route 4, between points A-AL-O-S-U-V. The first portion of the route (A-AL-O and part of the distance to S) crosses industrial lands and is not within public views. The next portion parallels the softball diamond in Central Park, to the Pittsburg-Antioch Highway (Point S). The following portion runs parallel to the Pittsburg-Antioch Highway about 150 feet north of the highway, then in the north shoulder of the highway. The final portion of the route runs north along the entrance road for the Delta Diablo Sanitation District. The areas to be disturbed are flat, previously disturbed fields or are along the shoulder of the highway. No trees or shrubs would be removed within the 50-foot right-of-way, and there would be no cut and fill slopes. The grasslands are expected to become reestablished within one season, and there should be no evidence of this pipeline during the operation phase after construction is complete. The period of construction is eight months. The impact would be temporary, so it would be less than significant. Route 4 is therefore not discussed further in this analysis.

FUEL GAS LINE

PROJECT DESCRIPTION Figure 4 shows the route of the proposed fuel gas line: Route 6 between points A-AL-O-P-Q-U-W-X. The first portion of the fuel gas line route (A-AL-O-P-Q) runs through the industrial USS-POSCO property. No public

views would be affected. The next segment (Q-U-W-X) would be installed along an existing 115 kV PG&E transmission line corridor. About 60 percent of this segment would be within public views. This segment flanks the fenced eastern boundary of Los Medanos College, but would not be visible from the college grounds due to a dense landscape screen lining the fence. The route then passes by residential and commercial areas. In addition to being near homes, it would be in the corridor serving the Delta De Anza Regional Trail. Views from urban residential areas and designated recreational trails are highly sensitive. However, the period of construction for the fuel gas line would be approximately two months, so any visual impact due to construction would be temporary. The land is flat, requiring no cut and fill slopes. No shrubs or tree would be removed. The disturbed grass areas are expected to recover within one growing season. Because the impacts would be temporary, they are not considered significant and this line is not discussed further in this analysis.

SANITARY SEWER LINE AND POTABLE WATER LINE

PROJECT DESCRIPTION Figure 4 shows the proposed route for the proposed sanitary sewer line and potable water line (Route 7, between points A and Y). These would be short lines north of the power plant site and would not be visible to the public. Therefore, visual impacts would not be significant and these lines are not discussed further in this analysis.

SETTING

REGIONAL SETTING

The PDEF would be located in the northern portion of Contra Costa County, along the south side of the Sacramento River and New York Slough, in the City of Pittsburg (see **PROJECT DESCRIPTION Figure 2**). The region encompasses a one-to-two mile strip of wetlands and flat river terrace lands, and the Los Medanos hills to the south that visually define the southern boundary of the area.

The region's landscape pattern reflects the area's long history as a transportation and industrial corridor and its more recent role as a bedroom community for the San Francisco Bay Area's suburban expansion. The area's industrial development is concentrated along the water and along the two major railroad lines: the Southern Pacific, and the Burlington Northern & Santa Fe (BN&SF), both of which run generally parallel to the water. The industrial facilities include Dow Chemical and USS-POSCO, as well as other heavy industries. The region is also a center for electric production with the existing Pittsburg Power Plant located along the river at the west end of Pittsburg and several small cogeneration plants in the industrial area at the east end of Pittsburg. State Route 4 separates the older portion of Pittsburg, including the project site, existing industrial development, the historic town center, older residential areas, and open space including wetlands, from more recent suburban residential and commercial development to the south.

PROJECT AREA SETTING

POWER PLANT VIEWSHED

VISUAL RESOURCES Figure 1 shows the approximate boundaries of the power plant viewshed (the areas from which the power plant would be seen) for sensitive view areas within one mile of the site. Sensitive view areas include public streets and places, recreation areas, and residences. Existing structures and trees block views of the power plant site from other sensitive areas within one mile of the proposed power pant site. The increase in elevation in the Pittsburg area from north to south is sufficiently gentle for two miles such that views of the proposed power plant site are screened from view by existing structures. From locations far enough away and therefore high enough to see the site, the project structures would be barely distinguishable from existing industrial development.

POWER PLANT VICINITY

The 12-acre PDEF power plant site and 20-acre construction laydown area are located in the northeastern portion of the City of Pittsburg in an industrial area (see **LAND USE Figure 1**). The sites are virtually flat. **VISUAL RESOURCES Figures 2a and 2b** are aerial views of the power plant site and the immediate vicinity. To the east is the USS-POSCO steel mill. To the north along New York Slough are the GWF Power Plant No.1and a PG&E substation. To the northwest is the Pittsburg Marine Terminal (PMT) petroleum coke handling facility. To the immediate west and south are open areas that have previously been used for industry, and include retention ponds. Farther west, on the east side of Harbor Street, is an area of mixed industrial and commercial land uses consisting of warehouses, automobile and marine services, and automobile dismantling facilities. On the west side of Harbor Street between East 3rd Street and East 8th Street is the Manville Products Company factory. The closest public street to the power plant site is East 3rd Street to the north of the site. This portion of the street runs through an industrial area. Harbor Street, the closest street to the west of the site, has industrial uses on both sides where it is closest to the power plant site, and open land and residences farther south. Santa Fe Avenue, the closest street to the south of the power plant site, has industrial facilities on the north side (in the direction of the power plant site) and residences on the south. Buildings block views of the power plant site from streets farther from the site.

VICINITY OF TRUCK BYPASS ROAD

The first portion of the proposed truck bypass route runs north from the Pittsburg-Antioch Highway to Santa Fe Avenue. To the west for this entire section of the route is an existing PG&E power line, with homes adjacent to the west side of the power line. On the east side of this section of the route, from south to north, are Central Park, with a baseball diamond; a large parking lot; a recreational storage area; and an industrial facility.

VISUAL RESOURCES Figure 1

The second portion of the truck bypass route runs west from just east of Columbia Street to Harbor Street. On the north side of the route is the BN&SF rail line, with open land and industrial facilities beyond. On the south side of the route is Santa Fe Avenue, with homes on the south side of the street for this entire section of the route.

Key Observation Points

This analysis focuses on viewers who are highly sensitive (see p.3) to changes in the visual setting and on existing visual features that affect the visual quality, visibility, and visual exposure to the proposed project for those viewers. Visual resource effects on each group of sensitive viewers were evaluated from representative KOPs[4]. **VISUAL RESOURCES Figure 3** shows the location of the KOPs used in this analysis[5] and the direction of each view.

Key Observation Point 1 – The Marina at New York Landing

KOP 1(see **VISUAL RESOURCES Figure 3;** VP1 in the AFC) represents highly sensitive view areas to the northwest of the proposed power plant site and the eastern section of the proposed transmission line route to the PG&E Pittsburg power plant. Views from this area toward the power plant site and transmission line route (see **VISUAL RESOURCES Figure 4a**) are mainly across the water from boats in New York Slough. In the right foreground of the view are the boat slips of the marina. Residences are visible along the shore to the left of the marina. Beyond that, the three white domes at the coke storage facility approximately 0.85 mile away are visible. These domes, together with their conveyors, are approximately 100 to 105 feet high, and are 165 feet in diameter. Brown's Island is visible on the left side of the view.

Visibility

For boaters on New York Slough, existing structures block the lower portions of views toward the power plant site, so visibility is moderate. Other sensitive viewers in the area include the marina and waterways and residences within and near the marina. These include The Village at New York Landing, a recent residential development located approximately 1,800 feet west of the project site (**see VISUAL RESOURCES Figure 2a**). Bay Harbor Park, New York Landing is another recent residential development, just north of The Village. The marina at New York Landing is just west of Bay Harbor Park. Views of the plant site from these developments

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[4] The applicant identified several viewing positions (VPs) in the Application for Certification (AFC) and subsequent documents that they used to evaluate visual impacts. Many of Energy Commission staff's KOPs correlate to the applicant's VPs (see following discussions); however, some differences exist.

[5] The view from Viewing Position 5 was not analyzed because it was a view toward the originally proposed route for the electric transmission line to USS-POSCO. KOP 5 (Viewing Position 6 on VISUAL RESOURCES Figure 3) is a replacement, with a view toward the revised route for that transmission line. No simulation is provided for KOP 6 (Viewing Position 3) because it was deemed to have no potential for visual impacts (see the following discussion). No simulation is provided for KOP 8 (Viewing Position 8) because the impacts of the western portion of the proposed electric transmission line to the PG&E Pittsburg power plant would be greater from KOPs 7 and 9, which are represented. Views from KOPs that were given further consideration are shown both before project construction and after project construction in **VISUAL RESOURCES** Appendix A.

are limited due to several factors. Views of the power plant site from the marina and the waterways and residences within and around the marina are restricted by buildings. Street trees also restrict views of the power plant site from residences in Bay Harbor Park. In addition, most of the Bay Harbor residences are aligned north-south, facing away from the plant site to the east. Most of these homes do not have windows on their east end, facing the power plant site, but on the northeast edge of the development two homes do (W-C 1998d, p.5.13-13). The views from these homes are in line with the view from KOP 1, but they are closer to the power plant site. Eight homes in the northeast quadrant of The Village face toward the power plant site. However, their windows are lower than the industrial buildings between them and the power plant site. The land is higher to the south, but an eight-foot wall flanks the homes along the east edge of the development, blocking views from the first floor. Some of the homes are two stories high, but a row of eucalyptus trees blocks the views from all but approximately three homes. (Key Observation Point 3, discussed below, is directly south of the eastern edge of The Village. Although lower than the second story views there, the view from KOP 3 is not screened by trees and therefore represents the view from the second story of the approximately three homes in The Village that are not blocked by trees.) For homes in this area with views toward the power plant site (two homes in Bay Harbor Park and three homes in The Village), visibility is moderate.

Visual Quality

The water provides visual value for views from boats on New York Slough, but due to the existing industrial development in the view visual quality is reduced to moderate. Existing industrial structures block the view of open land on the immediate west side of the power plant site for marina users and residences in Bay Harbor Park and The Village. Because heavy industry characterizes these views and no features of higher visual quality are present, visual quality in these views is low.

Viewer Exposure

For boaters the project site is in the middle ground. The marina is heavily used on occasion (W-C 1998d, p.5.13-12). The view duration for boaters is short. For boaters the overall viewer exposure is moderate. For the residences in Bay Harbor Park and The Village with views of the project view distance is middle ground, the number of viewers is small, and the view duration is long, so viewer exposure is moderate.

KEY OBSERVATION POINT 2 – SOUTHWEST CORNER OF EAST 8TH STREET AND HARBOR STREET

The residential area closest to the proposed power plant site and closest to the eastern portion of the proposed electric transmission line to the PG&E Pittsburg Power Plant is just south of East 8th Street, from Harbor Street west to East Street (see **VISUAL RESOURCES Figure 3**).[6] **VISUAL RESOURCES Figure 5a** [Patch 1998b] shows the existing view from KOP 2 from the nearest residence, at the southwest corner of East 8th Street and Harbor Street, toward the transition station

[6] There is no corresponding viewing position in the applicant's AFC because this location was subsequently selected by staff for use in a data request.

site (approximately 100 feet away), the site of one transmission tower (approximately 250 feet away) for the line to the PG&E Pittsburg power plant, the power plant site (approximately 0.25 mile away), and the site of two towers (approximately 0.25 mile away) for the line to the USS-POSCO steel mill. The view also represents views from the street for eastbound travelers.

Visibility

The view is unobstructed except for one small tree that screens a very small portion of the view. The homes in this area are oriented north-south, so the project is not in the primary view directions from the homes. However, the project would be clearly visible from their front yards. Considering these factors, visibility for the residences is moderate. Visibility is higher (moderate to high) for eastbound travelers on East 8th Street because the project facility sites are more directly in their view.

Visual Quality

The dominant feature in the view from KOP 2 is the sky. The petroleum coke handling facility, the GWF 1 power plant, and the USS-POSCO steel mill appear small on the horizon. Open land is visible between the view point and those industrial facilities. Out of the view to the left are the Manville equipment yard and warehouses. Considering these factors, visual quality is low-to-moderate.

Viewer Exposure

The distance to the transition station site and one pole site is foreground, the number of residences represented by this view is moderate, and the view duration is long, so viewer exposure is moderate to high. For eastbound travelers on East 8th street the number of viewers is moderate and view duration is short, so viewer exposure is moderate.

Key Observation Point 3 – East 8th Street near Cumberland Street

KOP 3 is on East 8th Street, approximately 0.44 mile from the power plant site (see **VISUAL RESOURCES Figure 3**). The view from KOP 3 (**see VISUAL RESOURCES Figure 6a;** VP2 in the AFC) represents views from residences farther from the aboveground portions of the project than KOP 2, but in the same residential neighborhood. The view also represents views from the street for eastbound travelers, and three homes in The Village (see the discussion regarding KOP 1, above). The power plant site is in the view. Also in the view are the eastern section of the transmission line route to the PG&E transmission line (including the transition station site) and a portion of the transmission line route to USS-POSCO.

Visibility

Homes in this area with views toward the power plant site, the transition station site, and the transmission line route are oriented north-south and none directly face the project facility sites. Peripheral views from approximately ten homes and one apartment complex (W-C 1998d, p.5.13-3) lining the south side of East 8th Street include the power plant site. Two homes on East 9th Street near its intersection with Harbor Street also have peripheral views of the power plant site. Trees provide some screening for some of these homes. Considering these factors, visibility is

moderate for those residences in this view area with views of the power plant site. Visibility is higher (moderate to high) for eastbound travelers on East 8th Street because the project facility sites are more directly in their view.

Visual Quality

The view from KOP 3 includes the vacant strip on the north side of East 8th Street and a wood electric distribution pole in the foreground, single-story industrial structures on the north side of East 8th Street in the middle ground, and portions of the petroleum coke handling facility and the USS-POSCO steel mill on the horizon. The open land raises the visual quality to low-to-moderate.

Viewer Exposure

The view distances to the transition station site, the transmission line route, and the power plant are all middle ground. For residences, the number of viewers is moderate and the view duration is long, so viewer exposure is moderate to high. For travelers, the number of viewers is moderate and the view duration is short, so viewer exposure is low to moderate.

KEY OBSERVATION POINT 4 – SOUTHWEST CORNER OF EAST SANTA FE AVENUE AND COLUMBIA STREET

Homes along the south side of Santa Fe Avenue from Harbor Street to the east side of Columbia Street have views toward the proposed power plant site, the route for the proposed truck bypass road, and the eastern portion of the route for the proposed transmission line to the PG&E power plant.[7] The closest point in this area to the power plant site is approximately 0.4 mile. VISUAL RESOURCES **Figure 7a** shows the view toward the project site from KOP 4 (the applicant's VP4; see VISUAL RESOURCES **Figure 3**), at the southwest corner of the intersection of East Santa Fe Avenue and Columbia Street.

KOP 4 generally also represents views from residences along the east side of Columbia Street from the Pittsburg-Antioch Highway to Santa Fe Avenue toward the route of the proposed truck bypass road. From the back yards of these homes, existing PG&E power lines are visible in the foreground, but the other portions of the views vary from south to north, with the softball field in Central Park, a large parking lot, a recreation vehicle storage area, and an industrial facility sequentially in view. From the homes along Santa Fe Avenue, the industrial features described in regard to KOP 3 are visible.

Visibility

The homes along Santa Fe Avenue block views toward the power plant site from homes farther south. Most of the homes along Santa Fe Avenue are oriented east-west, and have no windows on the north side. One home has views from the second story (PDEF 1998d, Data Response Visual-6). Tank cars on the BN&SF rail

[7] Part of the route for the electric transmission line to USS-POSCO is also visible from KOP 4, but more of it is visible from KOP 5, so it is addressed there.

Visual Resources Figure 3

line along the north side of Santa Fe Avenue often screen much of the lower portion of views toward the power plant site from this area. When the tank cars are not present, the petroleum coke storage domes of the Pittsburg Marine Terminal are visible on the horizon. Industrial cranes are also visible in the foreground. Considering these factors, visibility for the power plant site and the eastern portion of the route for the transmission line to the PG&E Pittsburg power plant are low to moderate. Views of one transmission line tower for service to USS-POSCO are partially screened by the tank cars, so visibility for this project element is moderate. The lower portion of views toward the truck bypass road from homes along Santa Fe Avenue and along the east side of Columbia Street are screened by fences. The proposed sound wall would block the view of the road except for the street lighting to be installed, so visibility is low to moderate for the bypass road. Views of the lower portion of the sound wall itself are screened by fences, but the upper portion of the wall would be visible above the fences. Overall, visibility is moderate.

Visual Quality

The view from KOP 4 includes a strip of open land in the foreground on the north side of Santa Fe Avenue; the railroad, tank cars, and cranes in the middle ground; and occasionally the petroleum coke handling facility on the horizon. The open land raises the visual quality to low-to-moderate.

For homes near the south end of Columbia Street, with views of the softball field in Central Park and open land beyond, visual quality is moderate.

Viewer Exposure

This KOP represents 23 residences (W-C 1998d, p.5.13-14), so the number of viewers is moderate. View duration is long. The view distances to the power plant site and to the route for the transmission line to the PG&E Pittsburg power plant are middle ground, and the distances to the truck bypass route and to the closest portion of the transmission line route to USS-POSCO are foreground, so viewer exposure is moderate to high.

KEY OBSERVATION POINT 5 – EAST SANTA FE AVENUE AT CEDAR STREET

VISUAL RESOURCES Figure 8a shows the existing view from KOP 5 (the applicant's VP6; see **VISUAL RESOURCES Figure 3**) from the intersection of Santa Fe Avenue and Cedar Street toward the proposed transmission line route to the USS-POSCO steel mill and toward the sound wall for the proposed truck bypass road.

Visibility

The homes along Santa Fe Avenue block views toward the transmission line route from homes farther south. Most of the homes along Santa Fe Avenue are oriented east-west, and have no windows on the north side. One of these homes does have a view from the second story. Railroad cars on the BN&SF rail line along the north side of Santa Fe Avenue often screen the lower portion of views toward the transmission line route from this area. However, views of the sound wall would be unobstructed for residents and travelers and it would be the closest and most prominent element in the view. Therefore, visibility is high.

Visual Quality

The view from KOP 5 includes a strip of open land in the foreground in front of railroad cars on the BN&SF line. The USS-POSCO steel mill is visible in the middle ground on the horizon in the right portion of the view. The open land raises the visual quality to low-to-moderate.

Viewer Exposure

The view distances to the transmission line route and the sound wall are foreground and the number of viewers is moderate. View duration is long for residents and moderate for travelers on Santa Fe Avenue. Therefore, viewer exposure is moderate to high.

KEY OBSERVATION POINT 6 – RAILROAD AVENUE NEAR CITY PARK

VISUAL RESOURCES **Figure 9a** shows the view toward the power plant site from KOP 6 (the applicant's VP3; see VISUAL RESOURCES **Figure 3**), from Railroad Avenue on the bridge at the northeast corner of City Park, approximately 0.85 mile from the power plant site. This view represents views from the park toward the power plant site, but from a position 20 to 30 feet higher than the park and approximately 200 feet closer to the power plant site. As VISUAL RESOURCES **Figure 9b** shows, trees and the bridge completely screen views toward the power plant site from the park, so the power plant structures would not cause any visual impacts from this KOP, and this analysis does not discuss this KOP further.

KEY OBSERVATION POINT 7 – JUST NORTH OF THE CORNER OF WEST 8TH STREET AND BEACON STREET

VISUAL RESOURCES **Figure 10a** shows the existing view from KOP 7, (the applicant's VP7; see **Visual Resources Figure 3**) toward the proposed site for the transition station at the west end of 8th Street, just north of the corner of Beacon Street, and of the above-ground portion of the transmission line route from the transition station to the PG&E Pittsburg power plant. In the foreground from the homes in the immediate area are two vertical tanks, with the PG&E Pittsburg power plant and storage tanks in the background. Trees are visible in the foreground and the middle ground.

Visibility

The views from homes in the immediate area toward the proposed transition station site are largely unobstructed, and only a small portion of the view of the transmission poles is screened, so visibility is high.

Visual Quality

Views toward the transition station site and transmission pole sites from this area are dominated by the existing industrial facilities, but the presence of a number of trees raises visual quality to low to moderate.

Viewer Exposure

The view distance to the transition station site and to two of the pole sites is foreground. The number of viewers is moderate, and the view duration is long. Therefore, viewer exposure is moderate to high.

KEY OBSERVATION POINT 8 –SOFTBALL FIELD IN MARINA PARK LOOKING WEST

VISUAL RESOURCES **Figure 11a** shows the view from KOP 8 (the applicant's VP8; see **VISUAL RESOURCES Figure 3**) on the softball field in Marina Park, looking west toward the western section of the proposed route for the electric transmission to the PG&E Pittsburg power plant. The existing transmission lines connected to the power plant are visible in the center of the view and the power plant is visible on the right side of the view. Because of the dominance of large industrial facilities in this view and the greater distance than from KOP 7, impacts of this portion of the proposed transmission line would be less than from KOPs 7 and 9, so no simulation from KOP 8 was prepared.

KEY OBSERVATION POINT 9 – NORTHWEST END OF MARINA PARK LOOKING SOUTH

VISUAL RESOURCES **Figure 12a** (from KOP 9; the applicant's VP9; see **VISUAL RESOURCES Figure 3**) shows the existing view from the northwest end of Marina Park looking south toward the western portion of the proposed electric transmission line route from the proposed power plant to the PG&E Pittsburg Power Plant substation. The park is visible in the foreground, with an open area in the middle ground and the Los Medanos Hills in the background. Existing storage tanks on the PG&E power plant property are visible on the right edge of this view.

Visibility

From the area that KOP 9 represents, blockage of views toward the sites of two of the proposed transmission poles varies with the view location in relation to trees in the park. Overall, visibility is moderate to high.

Visual Quality

From KOP 9 positive visual elements, including the park with trees in the foreground, the open area and trees in the middle ground, and the Los Medanos Hills in the background, predominate in the view. However, the PG&E storage tanks on the right side of the view detract from visual quality. Overall, visual quality is moderate for KOP 9.

Viewer Exposure

One transmission line pole site is in the foreground, the number of viewers is small, and the view duration is moderate, so viewer exposure is moderate.

PROJECT SPECIFIC IMPACTS

CONSTRUCTION IMPACTS

PROJECT SITE

The period of construction for the main site and offsite utility installation is expected to take about 20 months and would entail heavy construction equipment, temporary office facilities, laydown and storage area, and truck traffic. The power plant site is sufficiently far from residences that visual impacts due to construction would not be significant. The truck bypass road is expected to be completed in time to mitigate the visual impacts of traffic related to power plant construction (see PDEF 1998k, Table 3.7-4, p.3-8).

ELECTRIC TRANSMISSION LINES

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

Construction of the transmission line and transition stations would take approximately three months to complete and would occur within the overall timeframe for the construction activities at the power plant site (see PDEF 1998k, Table 3.7-4, p.3-10). Construction activities would be of short duration, so their impact on public views would not be significant.

STEAM LINE

The construction of the steam pipeline would not be visible to the public, so it would not cause any visual impact.

OFFSITE PIPELINES

The offsite pipelines, described above, would include a steam line, the reclaimed water line, the fuel gas line, the sanitary sewer line, and the potable water line. Construction would last less than one year. Because of the short duration, visual impacts during construction would not be significant.

TRUCK BYPASS ROAD AND SOUND WALL

Construction of the truck bypass road and sound wall is scheduled to take four months (PDEF 1998k, Table 3.7-4, p.3-8). Because of the short duration, visual impacts during construction would not be significant.

Operation Impacts

Key Observation Point 1

VISUAL RESOURCES Figure 4b [PDEF 1998k, Figure 5.13-9.b] shows the view from KOP 1 (see **VISUAL RESOURCES Figure 3**) with the proposed project simulated in the view. The upper portions of one of the heat recovery steam generators, the upper portions of the two HRSG stacks, and the upper portions of the first two transmission line structures (steel lattice) are visible. Existing structures and vegetation block other project elements.

Contrast with Structures

The project would cause a low level of contrast with existing industrial structures in regard to form, line, and scale. Scale contrast with existing residences would be low because the power plant would be farther from the view area than the existing homes. Contrast with existing residences in regard to form and line would be moderate. The gray color proposed for the power plant would contrast moderately with the colors of the existing structures. In summary, from KOP 1 contrast with structures would be moderate in regard to form, line, and color; and low in regard to scale.

Contrast with Vegetation

Vegetation visible in the view from KOPoint 1 toward the site consists of one large tree and a number of smaller trees near the marina, and the grass and trees visible on the hills in the distance. The portions of the project visible from this view area are predominantly vertical, while the nearby trees are rounded and the hills appears as a horizontal band, so the project would cause high contrast with vegetation regard to form and line. The proposed gray color of the power plant would contrast moderately with the green tones of the trees and the seasonally green to tan tones of the hills. Because of the distance of the project from KOP1, the contrast between the flat surfaces of project elements and the moderate texture of existing vegetation would not be readily discernible, so contrast with vegetation in regard to texture would be low. The distance also would make the project appear similar in size to some of the existing vegetation, so scale contrast would be low. In summary, if no existing structures were visible, contrast with vegetation would be high in regard to form and line, moderate in regard to color, and low in regard to texture and scale. However, because the existing industrial structures are similar to the proposed structures, the increment of contrast with vegetation added by the proposed structures would be small, and contrast with vegetation would be low.

Contrast with Land/Water

From KOP 1 the foreground and middle ground are largely composed of the water of New York Slough. The landform in the background includes the horizontal band of Brown's Island and the undulating form of the Los Medanos hills. Because the portions of the project visible from this view area would be predominantly vertical, the project would cause high contrast in regard to form and line. The proposed gray color of the project would contrast moderately with the color of the water. The project would appear smaller than the hills and the large expanse of water, so scale

contrast would be low. In summary, if no existing structures were visible, contrast with land and water would be high in regard to form and line, moderate in regard to color, and low in regard to scale. However, because the existing industrial structures are similar to the proposed structures, the increment of contrast with land added by the proposed structures would be small, and contrast with land would be low.

Scale Dominance

The project would appear small in comparison to the wide field of view, similar to existing structures, and would occupy a minor part of the setting. Therefore, scale dominance from KOP 1 would be negligible.

Spatial Dominance

Because the spatial composition of the view from KOPoint 1 is panoramic, the project would be subordinate in regard to composition. Because the visible portions of the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

View Blockage

From KOP 1 the project would block a small part of the view of the sky. Existing industrial structures already block more of the view than the project would, so the change that would be caused by the project would not be substantial. Therefore, view blockage would be negligible.

Visual Impact

Summarizing the visual factors for KOP 1:

- visual sensitivity is high;
- visual quality is moderate for boaters on New York Slough and low for viewers in New York Landing or The Village with views of the project;
- visibility is moderate;
- viewer exposure is moderate;
- the highest levels of contrast would be moderate;
- scale dominance would be negligible,
- spatial dominance would be co-dominant; and
- view blockage would be negligible.

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

KEY OBSERVATION POINT 2

VISUAL RESOURCES Figure 5b shows the view from KOP 2, from the nearest residence, at the southwest corner of East 8th Street and Harbor Street (see **VISUAL RESOURCES Figure 3**), with the project facilities simulated. The proposed transition station and the closest transmission pole of the proposed line to the PG&E power plant would be in full view in the foreground. Although both features would appear much larger than any element in the existing view, it is the 150-foot pole that would dominate the view. The proposed power plant would also be in full view beyond the transmission pole. The plant would screen the view of the existing GWF 1 plant, because it would be closer and larger than that plant. Two of the poles of the transmission line to the USS-POSCO steel mill would appear approximately as tall as the proposed HRSG stacks.

Contrast with Structures

The project would cause low levels of contrast with existing industrial structures in regard to form and line. However, because the transition station and the nearest transmission pole would appear much larger than existing industrial structures, scale contrast would be high. The gray color proposed for the proposed structures would cause only low contrast with the similar colors of the existing structures. In summary, from KOP 2 contrast with structures would be high in regard to scale and low in regard to form, line, and color.

Contrast with Vegetation

Vegetation visible in the view from KOP 2 toward the project consists of shrubs, grasses, and one small tree. The strong vertical form of the nearest transmission pole and the straight lines of the pole and the transition station would create high contrast with the predominantly horizontal form and irregular lines of the shrubs and grasses, so the project would cause high contrast with vegetation regard to form and line. The proposed gray color of the power plant would contrast moderately with the green tones of the tree and the seasonally green to tan tones of the shrubs and grasses. The height and foreground location of the transmission pole would make the project appear larger in size than any vegetation, so scale contrast would be high. In summary, contrast with vegetation would be high in regard to form, line, and scale, and moderate in regard to color. Because the proposed structures would appear much larger than existing industrial structures, the increment of contrast with vegetation added by the proposed structures would be substantial.

Contrast with Land/Sky

From KOP 2 the landform is almost flat, with slight undulations. The land forms a horizontal band. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. Very little unvegetated land surface is visible, so color contrast would be low. The project would appear approximately the same size as the entire landform, so scale contrast would be low. In summary, contrast with land would be high in regard to form and line, moderate in regard to color, and low in regard to scale. Because the proposed structures would appear much larger

than existing industrial structures, the increment of contrast with land added by the proposed structures would be substantial.

Scale Dominance

The project, particularly the closest transmission pole and the transition station, would appear large in comparison to the wide field of view, and would occupy a major part of the setting. Therefore, scale dominance from KOP 2 would be dominant.

Spatial Dominance

Because the spatial composition of the view from KOP 2 is panoramic, the project would be subordinate in regard to composition. Because the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

View Blockage

From KOP 2 the project would block a moderate part of a view with low to moderate visual quality, so view blockage would be negligible.

Visual Impact

Summarizing the visual factors for KOP 2:

- visual sensitivity is high;
- visual quality is low to moderate;
- visibility is moderate for residences and moderate to high for eastbound travelers on East 8th Street;
- viewer exposure is moderate to high for residences and moderate for travelers;
- contrast would be high with existing structures in regard to scale; high with vegetation in regard to form, line, and scale; and high with land in regard to form and line;
- scale dominance would be dominant;
- spatial dominance would be co-dominant; and
- view blockage would be negligible.

An additional consideration applies to the view from KOP 2. A planning document of the City of Pittsburg entitled *Pittsburg General Plan Update: Existing Conditions and Planning Issues* (1998) includes two planning issues relevant to the proposed project and potentially to visual resources. Chapter 3 (Land Use), under Planning Issues and Implications, contains issue 3-10: "**Buffers/transitional uses between**

industrial and residential areas. Appropriate buffers at transition points between industrial facilities and residential neighborhoods are generally lacking within the City. In particular, the industrial Northeast River area transitions abruptly to downtown neighborhoods at Harbor Street. This issue should be addressed during the General Plan process." Chapter 7 (Downtown), also under Planning Issues and Implications, contains a similar issue 7-10: "**Transitional buffers between residential and industrial areas (landscaping/parks/other uses).** Buffering and transition is an important issue, especially at the eastern end of downtown, where residential uses come into contact with heavy industrial uses. The kinds of buffers that would provide the requisite transition is an issue that should be examined in the General Plan update." The proposed transition structure and the closest transmission pole would conflict with efforts to establish a buffer between the industrial uses on the east side of Harbor Street and residences on the west side of Harbor Street. These project elements would extend heavy industry up to the margin of the open area that could be used for a buffer. The Pittsburg General Plan contains a policy requiring buffer landscaping (see the following discussion regarding compliance with applicable laws, ordinances, regulations, and standards).

Considering all of these factors, from KOP 2 the project without mitigation would cause a significant visual impact. Energy Commission staff discusses potential mitigation measures for this impact below.

KEY OBSERVATION POINT 3

VISUAL RESOURCES Figure 6b shows the view from KOP 3 (see **VISUAL RESOURCES Figure 3**), from residences on East 8th Street approximately 0.44 mile from the power plant site, with the project facilities simulated. As the figure shows, the two transmission poles in the eastern segment of the proposed line to the PG&E Pittsburg power plant would be in full view in the middle ground. The upper portions of the two steel lattice towers in the eastern segment of the proposed transmission line to the PG&E Pittsburg power plant as well as the upper portions of the two HRSG stacks would also be visible in the middle ground. One of the transmission poles for the line to the USS-POSCO steel mill would be fully visible in the middle ground. Although the transition station is not shown in the simulation, it would be visible at the east end of East 8th Street.

Contrast with Structures

The project features visible from KOP 3 would cause low levels of contrast with the existing electric distribution pole in regard to form, line, and scale. The project features would cause moderate contrast with existing industrial buildings and the petroleum coke storage domes in regard to form and line, and low contrast with these structures in regard to scale. The gray color proposed for the proposed structures would cause moderate contrast with the brown color of the distribution pole and the white color of the industrial buildings and petroleum coke storage domes in the view. In summary, from KOP 3 contrast with structures would be moderate in regard to form, line, and color, and low in regard to scale.

Contrast with Vegetation

Vegetation visible in the view from KOP 3 toward the project consists of grass, bushes, and trees in the foreground and middle ground. The strong vertical form and line of the proposed transmission structures and stacks would cause strong contrast with vegetation in regard to form and line. The gray color of the proposed structures would contrast moderately with the green tones of the tree and the seasonally green to tan tones of the shrubs and grasses. The greater distance to the project structures would make them appear approximately the size of some of the trees, so scale contrast would be low. In summary, contrast with vegetation would be high in regard to form and line, moderate in regard to color, and low in regard to scale. However, because the proposed structures would appear similar in size to the existing industrial structures, the increment of contrast with vegetation added by the proposed structures would be moderate, so contrast with vegetation would be moderate.

Contrast with Land/Water

From KOP 3 the landform is almost flat, with slight undulations. The land forms a horizontal band. No water is visible in this view. Because the project elements would be predominantly vertical and angular, the project would cause high contrast with land in regard to form and line. Very little unvegetated land surface is visible, so color contrast would be low. The project would appear approximately the same size as the entire landform, so scale contrast would be low. In summary, contrast with land would be high in regard to form and line, and low in regard to color and scale. However, because the proposed structures would appear similar in size to the existing industrial structures, the increment of contrast with land added by the proposed structures would be moderate.

Scale Dominance

The project features visible from KOP 3 would appear moderate in size compared to the wide field of view, and would occupy a moderate part of the setting. Therefore, scale dominance would be co-dominant.

Spatial Dominance

Because the spatial composition of the view from KOP 3 is panoramic, the project would be subordinate in regard to composition. Because the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

View Blockage

From KOP 3 the project would block a moderate part of a view with low to moderate visual quality, so view blockage would be negligible.

Visual Impact

Summarizing the visual factors for KOP 3:

- visual sensitivity is high;

- visual quality is low to moderate;
- visibility is moderate for residences and moderate to high for eastbound travelers on East 8th Street;
- viewer exposure is moderate to high for residences and low to moderate for travelers;
- contrast would be moderate with existing structures, vegetation, and land;
- scale dominance would be co-dominant;
- spatial dominance would be co-dominant; and
- view blockage would be negligible.

Considering all of these factors, from KOP 3 the project's visual impact would be less than significant.

KEY OBSERVATION POINT 4

VISUAL RESOURCES **Figure 7b** shows the view for ground level viewers toward the project site from KOP 4 (see VISUAL RESOURCES **Figure 3**), at the southwest corner of the intersection of East Santa Fe Avenue and Columbia Street, with the project features simulated. The proposed sound wall for the truck bypass road would be in the foreground and would dominate the view. The wall would block views of a number of existing industrial features to the following differing degrees: all of the tank cars, about half of the height of the existing electric lines on wood poles, and most of the view of the existing cranes. The wall would also block views of proposed project features to the following differing degrees: all of the power plant, about half of the height of the closest tower of the proposed electric transmission line to USS-POSCO, and most of the height of the street light that would be installed when the road is built. Only one two-story house on Santa Fe Avenue has a view to the north from the second story. That view would include full views of the proposed power plant and transmission towers from Harbor Street to Columbia Street (PDEF 1998d, Data Response Visual-6).

Contrast with Structures

Those project features other than the sound wall (the tower for the line to USS-POSCO and the street light pole) visible from KOP 4 would cause low contrast with existing industrial elements in regard to form and line, and low contrast with these structures in regard to scale. The gray color proposed for the sound wall would cause moderate contrast with the brown color of the existing wood electric line poles. The sound wall would create a horizontal element, replacing the horizontal elements provided by the rail line and the tank cars, so the wall would not substantially change the existing level of contrast between structures in regard to form, line, or scale. In summary, from KOP 4 contrast with structures would be moderate in regard to color and low in regard to form, line, and scale.

Contrast with Vegetation

Vegetation visible in the view from KOP 4 toward the project consists of bushes in the foreground. The landscaping for the sound wall would include grass. The landscaping would not substantially change the existing level of contrast between vegetation and structures in regard to form, line, color, or scale because a) the overall form of the grass would be a horizontal band, similar to the existing bushes, so form and line contrast would be low; b) the green color of the proposed landscaping would be similar to the color of the vegetation that it would replace; and c) the size of the area to be landscaped is similar to the size of the area currently with vegetation. In summary, contrast with vegetation would be low in regard to form, line, color, and scale.

Contrast with Land/Water

From KOP 4 the landform is flat. The land forms a horizontal band. No water is visible in this view. Because the most prominent project elements from this view, the sound wall and grass area, would appear as horizontal bands, contrast with land in regard to form and line would be low. Very little unvegetated land surface is visible, so color contrast would be low. The proposed sound wall and grass would appear approximately the same size as the entire landform, so scale contrast would be low. In summary, contrast with land would be low in regard to form, line, color, and scale.

Scale Dominance

The sound wall would appear large in size compared to the field of view, and would occupy a large part of the setting. However, it would block existing industrial features that appear similarly large compared to the field of view and occupy a similar portion of the setting. Therefore, the sound wall would not substantially change the existing level of scale dominance.

Spatial Dominance

Because the spatial composition of the view from KOP 4 is panoramic, the project would be subordinate in regard to composition. Because the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

View Blockage

From KOP 4 the sound wall would block a substantial part of a view with low to moderate visual quality, so view blockage would be weak.

Visual Impact

Summarizing the visual factors for KOP 4:

- visual sensitivity is high;
- visual quality is low to moderate;

- visibility is moderate;
- viewer exposure is moderate to high;
- color contrast with existing structures would be moderate, and all other aspects of contrast would be low;
- scale dominance would not change;
- spatial dominance would be co-dominant; and
- view blockage would be weak.

The visual impacts of the project from KOP 4 are unusual because the major project element in the view - the sound wall - would block most of the view of other proposed project elements as well as most of the view of existing industrial features. However, the sound wall would also reduce the existing view distance, create a monotonous view, and provide an opportunity for graffiti. Its overall impact would depend on the degree to which its negative aspects would be ameliorated through landscaping (see the discussion of this topic in the mitigation section).

KEY OBSERVATION POINT 5

VISUAL RESOURCES **Figure 8b** shows the view from KOP 5 (see **VISUAL RESOURCES Figure 3**) from the intersection of Santa Fe Avenue toward the proposed transmission line to the USS-POSCO steel mill and the sound wall for the proposed truck bypass road. The view represents the views of residents and travelers on Santa Fe Avenue. Four of the proposed transmission poles would be partially visible from this view. The portion visible would vary from a very small amount of the pole on the left to most of the pole on the right. The proposed sound wall would be visible in the foreground.

Contrast with Structures

The transmission poles would cause low contrast with the form and line of the wood poles for the existing electric line north of Santa Fe Avenue. Because the new poles would appear somewhat taller than the existing poles, they would create moderate scale contrast. The gray color of the poles and the sound wall would cause moderate color contrast with the brown color of the existing wood poles. The sound wall would create a horizontal element, replacing the horizontal elements provided by the rail line and railroad cars, so the wall would not substantially change the existing level of contrast between structures in regard to form, line, or scale. In summary, from KOP 5 contrast with existing structures would be moderate in regard to color and low in regard to form, line, and scale.

Contrast with Vegetation

Vegetation visible in the view from KOP 5 toward the project consists of grass, bushes, and a small tree in the foreground. The landscaping for the sound wall

would include grass. The landscaping would not substantially change the existing level of contrast between vegetation and structures in regard to form, line, color, or scale because a) the overall form of the grass would be a horizontal band, similar to the existing vegetation, so form and line contrast would be low; b) the green color of the proposed landscaping would be similar to the color of the bushes and tree, and seasonally similar to the grass that it would replace; and c) the size of the area to be landscaped is similar to the size of the area currently with vegetation. In summary, contrast with vegetation would be low in regard to form, line, color, and scale.

Contrast with Land/Water

From KOP 5 the landform is flat. The land forms a horizontal band. No water is visible in this view. Because the most prominent project elements from this view, the sound wall and grass area, would appear as horizontal bands, contrast with land in regard to form and line would be low. Very little unvegetated land surface is visible, so color contrast would be low. The proposed sound wall and grass would appear approximately the same size as the entire landform, so scale contrast would be low. In summary, contrast with land would be low in regard to form, line, color, and scale.

Scale Dominance

The sound wall would appear large in size compared to the field of view, and would occupy a large part of the setting. However, it would block existing industrial features that appear similarly large compared to the field of view and occupy a similar portion of the setting. Therefore, the sound wall would not substantially change the existing level of scale dominance. The transmission poles would appear small in comparison to the sound wall.

Spatial Dominance

Because the spatial composition of the view from KOP 5 is panoramic, the project would be subordinate in regard to composition. Because the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

View Blockage

From KOP 5 the sound wall would block a substantial part of a view with low to moderate visual quality, so view blockage would be weak.

Visual Impact

Summarizing the visual factors for KOP 5:

- visual sensitivity is high;
- visual quality is low to moderate;
- visibility is high;
- viewer exposure is moderate to high;

- color contrast with existing structures would be moderate, and all other aspects of contrast would be low;
- scale dominance would not change;
- spatial dominance would be co-dominant; and
- view blockage would be weak.

The poles for the proposed transmission line to USS-POSCO would be noticeable but would not cause a major change to the view. However, the sound wall would become the dominant visual element. The sound wall would block substantial portions of the view of the proposed transmission line to USS-POSCO as well as most of the view of existing industrial features. However, as with KOP 4, the sound wall would also reduce the existing view distance, create a monotonous view, and provide an opportunity for graffiti. Its overall impact would depend on the degree to which its negative aspects would be ameliorated through landscaping (see the discussion of this topic in the mitigation section).

KEY OBSERVATION POINT 7

VISUAL RESOURCES **Figure 10b**, from KOP 7 (**see VISUAL RESOURCES Figure 3**), shows the view from homes at the corner of West 8th Street and Beacon Street toward the proposed transition station just west of the west end of West 8th Street, and toward the western section of the proposed transmission line to the PG&E Pittsburg power plant. The transition station and the first two transmission poles after the transition station would be visible in the foreground, along with two existing vertical tanks, a rectangular building, and large PG&E storage tanks to the left. The third transmission pole would be in the middle ground, along with the PG&E Pittsburg power plant. Trees are visible in the foreground and the middle ground.

Contrast with Structures

The transition station would be similar in form and line to the existing structures of the PG&E Pittsburg power plant. The poles would be similar in form and line to the existing exhaust stacks of the PG&E plant. The transition station and the poles would be similar in color to the PG&E plant. The transition station would be similar in scale to the existing industrial structures. However, the closest transmission pole would appear twice as tall as the existing PG&E stacks, and the second pole would appear slightly taller than the stacks. When the stacks have large plumes, as in Figure 11b, the total height of the existing stacks and plumes would be similar to the height of the closest pole. However, for much of the time this would not be the case. In summary, from KOP 7 contrast with existing structures would be high in regard to scale and low in regard to form, line, and color.

Contrast with Vegetation

Vegetation visible in the view from KOP 7 toward the project consists of trees in the foreground and middle ground. The rectilinear form and line of the transition station

and poles would contrast highly with the rounded, irregular form and line of the trees. The proposed gray color of the transition station and poles would contrast moderately with the green color of the trees. The closest pole would appear approximately three times as tall as the trees, so scale contrast would be high. In summary, contrast with vegetation would be high in regard to form, line, and scale, and moderate in regard to color. Because the proposed structures would appear much larger than existing industrial structures, the increment of contrast with vegetation added by the proposed structures would be substantial.

Contrast with Land/Water

From KOP 7 the landform is not apparent and no water is visible, so contrast in this regard would be low.

Scale Dominance

The closest transmission pole wall would appear large compared to the field of view, and would occupy a large part of the setting. Therefore, scale dominance would be dominant.

Spatial Dominance

Because the spatial composition of the view from KOP 7 is panoramic, the project would be subordinate in regard to composition. Because the project would be backdropped by sky, spatial dominance in regard to backdrop would be prominent. The overall spatial dominance rating would be co-dominant.

View Blockage

From KOP 7 the transition station and transmission poles would block a major portion of a view with low to moderate visual quality, so view blockage would be weak.

Visual Impact

Summarizing the visual factors for KOP 7:

- visual sensitivity is high;
- visual quality is low to moderate;
- visibility is high;
- viewer exposure is moderate to high;
- contrast with structures would be high in regard to scale and low in regard to form, line, and color; contrast with vegetation would be high in regard to form, line, and scale, and moderate in regard to color.
- scale dominance would be dominant;
- spatial dominance would be co-dominant; and

- view blockage would be weak.

The issue of inadequate buffers between residential and industrial uses is also relevant to the view from KOP 7. A complicating factor is that the homes that the view represents are in the City of Pittsburg, but the industrial facilities just to the north of them are in an unincorporated part of Contra Costa County. Pittsburg therefore has no jurisdictional control over the industrial area. Nevertheless, Pittsburg's recognition that parts of the city lack buffers between residential and industrial uses is relevant. The proposed transition station would block much of the view of existing trees that provide a partial buffer for the existing industrial features. The closest transmission pole would dominate the view and would severely limit the effectiveness of any attempt at buffering through landscaping. In addition, the staff of the Contra Costa County Community Development Department has expressed concern regarding the aesthetic impact of the proposed 150-foot tall transmission towers and related facilities (Contra Costa County 1999).

For the view area represented by KOP 7, because visual sensitivity is high; visibility is high; viewer exposure is moderate to high; contrast with structures would be high in regard to scale; contrast with vegetation would be high in regard to form, line, and scale; and scale dominance would be dominant, visual impacts from the view area represented by KOP 7 would be significant without mitigation. The proposed project would lower visual quality from low-to-moderate to low. Staff has proposed mitigation for these impacts (see the mitigation discussion that follows).

KEY OBSERVATION POINT 9

VISUAL RESOURCES Figure 12b from KOP 9 (see VISUAL RESOURCES **Figure 3**), shows the view from the northwest end of Marina Park looking south toward the western portion of the proposed electric transmission line from the proposed power plant to the PG&E Pittsburg Power Plant substation. [Energy Commission staff has questioned the accuracy of this simulation. The applicant provided a response to staff's data request regarding this issue, on March 4, 1999, too late for consideration in this analysis. Staff expects to incorporate this new information in supplemental testimony.

LIGHTING

Although the proposed power plant is in an industrial area, existing lighting levels are generally low in the immediate vicinity. Exterior lighting for the proposed power plant therefore has the potential to considerably increase lighting levels, creating glare, backscatter to the nighttime sky, and illumination of visible plumes. The applicant has proposed measures to reduce such impacts, and Energy Commission staff has expanded on these measures in a proposed condition of certification (see below). The *Final Environmental Impact Report for the Waterfront Truck Route and Proposed Assessment District* (Santina & Thompson 1991, p.95) states that "The design standards for the truck route call for light standards at approximately 390 foot intervals along the entire route of new roadway. Illumination would be at an average intensity of 2.0 candlepower during night time hours."

The EIR recognized the potential for impacts due to the street lighting: "Residential areas will be within 100-125 feet of light poles (approximately 25 feet high). Lighting and glare may be visible to residents along East Santa Fe Avenue and in the backyards along Columbia Street."

The EIR proposed mitigation for these lighting impacts: "Light fixtures on street lights should be designed to direct light onto roadway areas and to keep light 'spillage' to a minimum, while maintaining safe street lighting." Energy Commission staff concurs with this proposed mitigation measure and has include it in a proposed condition of certification to minimize lighting impacts (see below).

VISIBLE PLUMES

Cooling Tower Plumes

The applicant, in its Revisions in Response to CEC's Data Adequacy Review Comments (W-C 1998d, p.5.13-18) stated that "under certain meteorological conditions a steam plume from the cooling towers…would be visible, rising an estimated 100-500 feet above the power plant." In response to an Energy Commission staff data request, the applicant provided modeling results for the frequency, duration, and size of visible plumes from the project's cooling tower (PDEF 1998d, Responses to Data Requests Visual-7 and 8). The visibility of nighttime plumes depends on the degree to which they are illuminated. Because existing exterior lighting levels in the vicinity of the power plant site are low, and because the applicant has proposed to minimize exterior lighting, the plume is not expected to be substantially visible at night. Staff also acknowledges that a cooling tower plume would create less visual contrast during foggy conditions. From the applicant's data Energy Commission staff calculated the size and frequency of the project's cooling tower plumes for daytime hours when no fog occurs (Loyer 1999). These calculations indicate that a cooling tower plume at least 30 meters (98 feet) in total height would be visible for 88 percent of all daylight hours with no fog. A plume at least 50 meters in total height (164 feet) would be visible for 26 percent of all daylight hours with no fog. A plume at least 70 meters in total height (230 feet) would be visible for 10 percent of all daylight hours with no fog. A plume at least 90 meters in height (295 feet) would be visible for 2.2 percent of all daylight hours with no fog. A plume with the maximum total height, approximately 700 meters (2297 feet) would be visible for 1.4 percent of all daylight hours with no fog.

As the applicant has stated, "Other industrial facilities in the area also produce condensate/steam plumes" (W-C 1998d, p.5.13-18). Although the plumes from the PG&E Power Plant are the largest in the area, they are not visible in views toward the proposed power plant site. The PG&E Contra Costa Power Plant is several miles to the east, sufficiently far that plumes are not noticeable from the PDEF viewshed. Other plumes closer to the proposed power plant site emanate from the cooling towers of the GWF Power Plant No.1 to the north and plumes from USS-POSCO's acid processor to the east. Energy Commission staff has received data regarding the factors that contribute to cooling tower plumes at the nearby GWF Power Plant No.1 (GWF 1999). Using the same procedure for calculating plumes, the results indicate that the cooling tower plumes for the GWF Power Plant No.1 are

larger than the cooling tower plumes for the PDEF would be (Loyer 1999). Therefore, the cooling tower plumes from the PDEF would not substantially intensify the industrial character of the area and visual impacts from those plumes would be less than significant.

Exhaust Stack Plumes

In response to an Energy Commission staff data request, the applicant has stated that "while the cooling towers will be the dominant source of visible plumes, upon further review it was concluded that under certain meteorological conditions a steam plume from the HRSG stacks would also be visible" (PDEF 1998_, Response to Data Request Visual 9). The applicant did not provide quantified estimates of the frequency, duration, or size of visible steam plumes from the HRSG exhaust stacks. **VISUAL RESOURCES Figure 11b** from KOP 7 (see **Visual Resources Figure 3**) shows exhaust plumes from two of the stacks of the existing PG&E Pittsburg Power Plant. The exhaust stack plumes would be smaller than the cooling tower plumes discussed above (Loyer 1999), so they would not substantially intensify the industrial character of the area and visual impacts from those plumes would be less than significant.

CUMULATIVE IMPACTS

The proposed power plant would add a noticeable but not considerable increment to the existing industrial character of northeast Pittsburg. In regard to the potential for cumulative visual impacts from the existing PG&E Pittsburg plant, the proposed PDEF, and the proposed Delta Energy Center plant, almost none of the residential viewers with a view of one of these plants would have a view of the other plants, so the three plants would not cause a cumulative visual impact for local residents. In conclusion, the proposed power plant would not contribute substantially to a significant cumulative visual impact.

FACILITY CLOSURE

INTRODUCTION

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure**.**

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to prepare should address removal of the power plant structures and the transmission poles to reduce visual impacts.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a

natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare should address removal of the power plant structures and the transmission poles to reduce visual impacts.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

LOCAL

The power plant and most of the linear facilities would be located in the City of Pittsburg. A portion of two linear facilities would be in the City of Antioch. These include the southeastern terminus of the fuel gas pipeline (Route 6) and the reclaimed water pipeline segments near the Delta Diablo Sanitation District facility. The western portion of the proposed electric transmission line to the PG&E Pittsburg Power Plant substation would cross unincorporated land under the jurisdiction of Contra Costa County.

CITY OF PITTSBURG

GENERAL PLAN

As was previously discussed, five policies within the City of Pittsburg General Plan (Pittsburg 1988) are relevant to the project. Four are in the Land Use Element, and one is in the Parks and Recreation Element, as described below.

2. Land Use Element

2.1 Community Image

Guiding Policies

E. Preserve the feel of a city surrounded by open space, and preserve corridors to the hills and to the waterfront."

Implementing Policies

S. Make preservation of view corridors to the hills and to the waterfront a consideration in project and design review."

The proposed project would not reduce the amount of open space surrounding the city and would not impinge on any view corridors of the hills or the waterfront, so it appears to be in compliance with these two policies.

2.8 Industrial Development

Guiding Policies

D. Protect existing and new residential areas from adverse effects of new industry and, wherever feasible, of existing industry.

Implementing Policies

J. Adopt setback, landscaping, and screening requirements for industrial development to protect adjacent non-industrial uses.

The proposed project has the potential to not comply with the policy to protect existing residential areas from adverse effects of new industry. This applies to residences represented by KOP 2, potentially affected by the proposed transition station and pole, and by KOPs 4 and 5, potentially affected by the proposed sound wall. Proposed condition of certification VIS-4 would ensure compliance regarding the sound wall. Mitigation measures need to be devised to address the effects on residences represented by KOP 2.

4. Parks and Recreation Element

4.2 Park and Recreation Facilities, Planning and Management

Implementing Policies

O. Maintain view corridors for views of the river.

Because the project would not interfere with any view corridors for views of the river, it would comply with this policy.

5. Public Facilities, Institutions, and Utilities Element

5.3 Utilities and Public Services

Guiding Policies

C. Require buffer landscaping and multiple use, where feasible, of utility sites and rights-of-way to harmonize with adjoining uses.

The project as proposed does not include buffer landscaping for the two proposed electric transition stations, so it does not comply with this policy. However, Energy Commission staff intends to develop mitigation for the visual impacts of the transition stations that would achieve compliance with this policy.

ZONING ORDINANCE

Compliance with Section 18.54.105 of the Pittsburg Zoning Ordinance (Pittsburg 1994) regarding landscaping or fencing and Section 18.80.045 regarding signs would be ensured by proposed condition LAND-1 in Energy Commission staff's testimony regarding **LAND USE**.

Compliance with the requirements of Section 18.80.035 regarding screening of refuse storage areas would be ensured by proposed condition VIS-5 (see the Proposed Conditions of Certification).

Compliance with the requirements of Section 18.82.045 regarding site maintenance would be ensured by proposed condition VIS-6 (see the Proposed Conditions of Certification).

CITY OF ANTIOCH

GENERAL PLAN

Community Design Policy 2 in the City of Antioch General Plan (Antioch 1988) states that "Views along utility easements should be retained and enhanced through the use of planting materials to frame and focus views and to provide a sense of orientation." Approximately 450 feet of Route 4 of the proposed reclaimed water line would be within public view within the right-of-way for the Pittsburg-Antioch Highway. Although the line would be underground, installation would disturb the ground surface. The remainder of the parts of Routes 4 and 5 that are within the City of Antioch would cross industrial lands not open to the public. The construction and operation of this pipeline would not impair views along its right-of-way, and "the use of planting materials to frame and focus views…" on the shoulder of the road is not appropriate because the shoulder of the road must be kept free of vegetation for emergency use.

A part of the fuel gas line (Route 6) would cross the City of Antioch east of Los Medanos Drive, would follow an existing easement, and would be underground. Much of the route is lined with eucalyptus trees. Segment W-X would also be within an existing utility easement and underground. It follows a regional trail/bikeway and is landscaped with a lawn. Views along Route 6 would be adversely affected during construction, but because the construction phase is temporary, the impact would not be significant. Energy Commission staff has proposed a condition of certification (see below) to require restoration of any landscaping that is disturbed during construction or operation of the pipeline.

CONTRA COSTA COUNTY

The proposed transition station just north of the corner of West 8th Street and Beacon Street would not comply with the following policies in the Contra Costa County General Plan.

- Land Use Element, Policy 3-19 - Buffers shall be provided between new industrial developments and residential areas by establishing setbacks, and park-like landscaping or other appropriate mechanisms.

- Land Use Element, Implementation Measure 3-z - Initiate and enforce, if necessary, specific development standards for both proposed and existing businesses to achieve appropriate landscaping design and sign structures.

- Open Space Element, Scenic Resource Policy 9.24 – The appearance of the County shall be improved by eliminating negative features such as non-conforming signs and overhead utility lines, and by encouraging aesthetically designed facilities with adequate setbacks and landscaping.

The proposed project does not include landscaping. As discussed in the mitigation section, this issue should be resolved at public workshops including the Energy Commission staff, the applicant, Contra Costa County, and the public.

The above-ground portion of the proposed transmission line to the PG&E Pittsburg Power Plant that crosses land under the jurisdiction of Contra Costa County would not comply with Open Space Element Scenic Resource Policy 9.17 - New power lines shall be located parallel to existing lines in order to minimize their visual impact. This issue should be resolved at workshops including the Energy Commission staff, the applicant, Contra Costa County, and the public.

MITIGATION

APPLICANT'S PROPOSED MITIGATION MEASURES

The application stated that the project would be consistent with all applicable laws, ordinances, regulations, standards, policies, goals, and guidelines relevant to the protection and enhancement of visual resources and would cause no adverse visual impact. Therefore, the application stated that no mitigation measures are proposed (PDEF 1998a, p.5.13-20).

ADDITIONAL MITIGATION

POWER PLANT

Energy Commission staff generally agrees with the applicant's proposals in regard to color and lighting for the power plant. However, staff's position is that these proposals need to be more precisely developed in conditions of certification, which staff proposes below.

The power plant would cause visible plumes from the HRSG exhaust stacks and from the cooling tower. **[Confer with Joe Loyer re: potential mitigation]**

Transmission Line to USS-POSCO Steel Mill

Because staff found the visual impacts of the proposed transmission line to USS-POSCO to be less than significant, staff recommends no mitigation measures for that line.

Transmission Line to PG&E Pittsburg Power Plant Substation

Eastern Above-Ground Section

Energy Commission staff, as discussed above, concludes that the proposed transition station at the east end of 8th Street and the closest transmission pole to the station have the potential to cause significant visual impacts. These project elements would be very near the boundary between industrial and residential areas. This would make successful creation of buffers between these uses, as contemplated by the City of Pittsburg (City of Pittsburg 1998) very difficult. The transmission pole in particular, with its close distance to residents and its large size, would dominate the view, and no feasible screening could substantially reduce this impact.

Because Energy Commission staff only recently received the visual simulation of this project element, the potential for feasible, effective, and appropriate mitigation has not yet been determined. This topic should be discussed with the applicant, Pittsburg, and any interested members of the public.

Western Above-Ground Section

Energy Commission staff, as discussed above, concludes that the proposed transition station at the west end of 8th Street and the closest transmission pole to the station have the potential to cause significant visual impacts. Although industrial features already exist within foreground distances of the residences in this area, the proposed transition station would block the view of some of the trees that currently provide screening of existing industrial facilities. The transmission pole in particular, with its close distance to residents and its large size, would dominate the view, and no feasible screening could substantially reduce this impact.

Because Energy Commission staff only recently received the visual simulation of this project element, the potential for feasible, effective, and appropriate mitigation has not yet been determined. This topic should be discussed with the applicant, Pittsburg, Contra Costa County, and any interested members of the public.

Truck Bypass Road and Sound Wall

As was discussed previously, the overall impact of the sound would depend on the degree to which its negative aspects would be ameliorated through landscaping. Energy Commission staff asked whether the applicant would commit to providing a virtually continuous screen along the entire length of the sound wall to minimize the potential for graffiti (CEC 1998i, Data Request Visual 10). The applicant's responded as follows:

"The Applicant believes it would be premature to commit to a specific landscaping plan at this time. The PDEF, LCC formed the Power Plant Advisory Committee (PPAC) consisting of 13 members including residents and special interest groups to provide ongoing input and advice related to the Truck Bypass Road, sound wall, and various other community concerns. The PDEF, LLC together with the PPAC will initiate a community action project to select the appropriate treatment of the sound wall. The Applicant is currently investigating potential wall covering treatments to be presented to the PPAC for consideration. Potential wall covering alternatives (e.g., landscaping) will be considered in conjunction with other amenities such as recreational facilities (e.g., picnic tables, BBQs, etc.) and artistic treatments (e.g., construction materials, design, etc.). The applicant will present the results of the community action project to the CEC once the appropriate treatment of the sound wall is determined" (PDEF 1998d, Response to Staff Data Request Visual-10).

The *Final Environmental Impact Report for the Waterfront Truck Route and Proposed Assessment District* (Santina & Thompson 1991, p.22) states that "North of Santa Fe Avenue an unnamed park site has been designated for the area between Harbor Street and Columbia Street (Figure 8). According to Randy Jerome, Senior Planner, this area could be used as a linear park to serve residences south of Santa Fe Avenue in the existing large residential area. Implementing policies in the General Plan encourages the City to 'Pursue and encourage development of 'pocket parks' in currently developed areas where such space is available.'" The Final EIR (Figure 12) also shows a proposed linear park east of Columbia Street, between existing residences and the sound wall.

Energy Commission staff recommends that the treatment of the sound wall, the strip of land between the sound wall and Santa Fe Avenue, and the strip of land between the sound wall and the residential properties on the east side of Columbia Street be determined by consultation between the Power Plant Advisory Committee, the City of Pittsburg, and Energy Commission staff. Staff has proposed a condition of certification to ensure that this occurs.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The project as proposed has the potential to cause significant adverse visual impacts due to the visual effects of the proposed electric transition stations, nearby transmission poles, and the sound wall for the truck bypass route. Effective implementation of applicant's proposed mitigation measures, as modified and expanded by staff's recommendations, is expected to reduce visual impacts, except for impacts due to the electric transition stations and nearby transmission poles, to less than significant levels. With the proposed mitigation, the project, except for the electric transition stations and nearby transmission poles, is expected to be in compliance with applicable laws, ordinances, regulations, and standards regarding visual resources.

RECOMMENDATIONS

Mitigation for visual impacts due to the proposed electric transition stations and nearby transmission poles should be developed at public workshops.

The Energy Commission should adopt the following conditions of certification if it approves the project.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to the start of commercial operation, the project owner shall treat the project structures, buildings, and tanks visible to the public in a non-reflective color to blend with the surroundings. The project owner shall treat the exhaust stacks with a heat-resistant color that minimizes contrast and harmonizes with the surrounding environment.

The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

- specification, and 11” x 17” color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
- a detailed schedule for completion of the treatment; and,
- a procedure to ensure proper treatment maintenance for the life of the project.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

The project owner shall notify the CPM within one week after all precolored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

Verification: Not later than 30 days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

Not less than thirty days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 Any fencing for the project shall be non-reflective.

At least 30 days prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

Verification: At least 30 days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

VIS-3 Prior to the start of commercial operation, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements:

The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval. The lighting plan shall require that:

- Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

- High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied;

- A lighting complaint resolution form (following the general format of that in attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least 90 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval. The CPM will notify the project owner of approval or disapproval within 15 days of receipt of the lighting plan.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection.

VIS-4 By the end of the calendar year in which the project owner starts construction of the sound wall for the truck bypass route, the project owner shall implement a treatment plan for the sound wall, the strip of land between the sound wall and Santa Fe Avenue, and the strip of land between the sound wall and the residential properties on the east side of Columbia Street. The objective of the treatment plan shall be to minimize visual impacts and to maximize the potential for community benefit.

Protocol: The project owner shall submit to the CEC CPM for review and approval a specific plan describing its treatment plan, providing evidence that the Power Plant Action Committee and the City of Pittsburg have been consulted regarding the plan, and attaching any recommendations from the Power Plant Action Committee and the City of Pittsburg. The plan shall include, but not be limited to:

- a detailed landscape plan, at a reasonable scale, which includes a list of proposed tree and shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives.

- maintenance procedures, including any needed irrigation; and

- a procedure for replacing unsuccessful plantings.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

The landscaping and any other plan features shall not be installed before the plan is approved. The project owner shall notify the CPM, the Power Plant Action Committee, and the City of Pittsburg when the plan has been implemented and is ready for inspection.

Verification: At least 60 days prior to the start of construction of the sound wall, the project owner shall submit the proposed treatment plan to the CPM for review and approval. The project owner shall also submit the proposed treatment plan to the Power Plant Action Committee and to the City of Pittsburg for review and comment. The project owner shall submit any required revisions within 30 days of notification by the CPM. The project owner shall notify the CPM, the Power Plant Action Committee, and the City of Pittsburg within seven days after implementing the proposed plan that the treatment is ready for inspection.

VIS-5 The project owner shall comply with the requirements of Section 18.80.035 of the City of Pittsburg Zoning Ordinance regarding screening of refuse storage areas.

The project owner shall submit a plan for screening refuge storage areas to the CPM for review and approval. The submittal shall include evidence from the City of Pittsburg that the plan conforms to the requirements of Section 18.80.035 of the zoning ordinance.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

The project owner shall notify the CPM within one week after the screening has been installed and is ready for inspection.

Verification: At least 30 days prior to installing the screening, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the screening that the screening is ready for inspection.

VIS-6 The project owner shall comply with the requirements of Section 18.82.045 of the City of Pittsburg Zoning Ordinance regarding site maintenance.

Verification: In each Annual Compliance Report the project owner shall submit a statement that the requirements of Section 18.82.045 of the City of Pittsburg Zoning Ordinance have been met.

VIS-7 The project owner shall restore any landscaping that is disturbed during the construction or operation of the portion of the proposed fuel gas pipeline (Route 6) that would cross the City of Antioch.

The project owner shall submit a plan for restoring any landscaping disturbed during construction of the proposed fuel gas pipeline. The submittal shall include evidence from the City of Antioch that the plan conforms to the requirements of Community Design Policy 2 in the City of Antioch General Plan.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

The project owner shall notify the CPM within one week after the landscaping has been installed and is ready for inspection.

Verification: At least 30 days prior to installing the screening, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscaping that the landscaping is ready for inspection.

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ATTACHMENT 1
LIGHTING COMPLAINT RESOLUTION FORM

LIGHTING COMPLAINT RESOLUTION FORM

PITTSBURG DISTRICT ENERGY FACILITY Pittsburg, California
Complainant's name and address: Phone number:
Date complaint received: Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted:
Description of corrective measures taken: Complainant's signature: _____ Date:
Approximate installed cost of corrective measures: $ Date installation completed: Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct: Plant Manager's Signature:

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

VISUAL RESOURCES APPENDIX A

Visual Resources Figures 4 through 12

VISUAL RESOURCES Figure 1

Power Plant Viewshed for Sensitive View Areas within One Mile

Source: W-C 1998d, Map 5.13-2

VISUAL RESOURCES Figures 2a and 2b
Aerial Views of the Power Plant Vicinity

Source: PDEF 1998a, Figures 5.13-3 a) and b)

VISUAL RESOURCES Figure 3
Locations and View Directions for Key Observation Points

Source: PDEF 1998k, Map 5.13.1

VISUAL RESOURCES Figure 4a
Existing View from Key Observation Point 1

VISUAL RESOURCES Figure 4b
Proposed Project from Key Observation Point 1

Source: PDEF 1998k, Figures 5.13-9 a) and b)

VISUAL RESOURCES Figure 5a
Existing View from Key Observation Point 2

Source: Patch 1998b

VISUAL RESOURCES Figure 5b
Proposed Project from Key Observation Point 2

Source: Patch 1998b

VISUAL RESOURCES Figure 6a
Existing View from Key Observation Point 3

VISUAL RESOURCES Figure 6b
Proposed Project from Key Observation Point 3

Source: PDEF 1998k, Figures 5.13-10 a) and b)

VISUAL RESOURCES Figure 7a
Existing View from Key Observation Point 4

VISUAL RESOURCES Figure 7b
Proposed Project from Key Observation Point 4

Source: PDEF 1998k, Figures 5.13-11 a) and b)

VISUAL RESOURCES Figure 8a
Existing View from Key Observation Point 5

VISUAL RESOURCES Figure 8b
Proposed Project from Key Observation Point 5

Source: PDEF 1998k, Figures 5.13-13 a) and b)

VISUAL RESOURCES Figure 9a
Existing View from Key Observation Point 6

VISUAL RESOURCES Figure 9b
Existing View from City Park

Source: PDEF 1998a, Figures 5.13-7 a) and b)

VISUAL RESOURCES Figure 10a
Existing View from Key Observation Point 7

Source: Patch 1998b

VISUAL RESOURCES Figure 10b
Proposed Project from Key Observation Point 7

Source: Patch 1998b

VISUAL RESOURCES Figure 11
Existing View from Key Observation Point 8

Source: PDEF 1998k, Figure 5.13-8.2a

VISUAL RESOURCES Figure 12a
Existing View from Key Observation Point 9

VISUAL RESOURCES Figure 12b
Proposed Project from Key Observation Point 9

Source: PDEF 1998k, Figures 5.13-14 a) and b)

CULTURAL RESOURCES

Testimony of Kathryn M. Matthews and Dorothy Torres

INTRODUCTION

This analysis discusses cultural resources that are defined to include the structural and cultural evidence of the history of human development and life on earth. Evidence of California's early occupation is becoming increasingly vulnerable to the ongoing development and urbanization of the state.

Cultural resource materials may be found nearly anywhere in California: along the ocean coastline and on coastal islands; along rivers and streams; in coastal and inland valleys and lowlands; throughout the coastal and inland mountain ranges; and throughout the interior deserts. Cultural resources may be found on the ground or may be found at varying depths beneath the surface. In some areas of the state, a sequence of settlements on the same site may cover multiple layers of cultural resources. In other areas, the distribution of cultural materials may be much more dispersed

Cultural resources are significant to our understanding of our culture, our history and heritage. Critical to the analysis of cultural resources are the spatial relationships between an undisturbed cultural resource site and the surface environmental resources and features, and the analysis of the locational context of the resource materials within the site and beneath the surface. These relationships provide information that can be used to piece together the sequence of human occupation and use of an area, and they begin to create a picture of the former inhabitants and their environment.

Staff's primary concerns in its cultural resource analysis are to ensure that all potential impacts are identified and that conditions are set forth which ensure no significant adverse impacts will occur. The determination of potential impacts to cultural resources from the proposed Pittsburg District Energy Facility (PDEF) is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Three aspects of cultural resources are addressed in Staff's analysis: prehistoric archaeologic resources, historic archaeologic resources and ethnographic resources

PREHISTORIC RESOURCES

Prehistoric archaeologic resources are those materials relating to prehistoric human occupation and use of an area; these resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of prehistoric human behavior. In California the prehistoric period began over 10,000 years ago and extended through the 18th century when the first Euro-American explorers settled in California.

HISTORIC RESOURCES

Historic archaeologic resources are those materials usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record; they may include archaeological deposits, sites, structures, travelled ways, artifacts, documents, or other evidence of human activity. Under state requirements, cultural resources must be greater than 100 years old while under federal requirements, such materials are considered if they are greater than 50 years old.

ETHNOGRAPHIC RESOURCES

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans, African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, § 431-433) and subsequent related legislation, policies, and enacting responsibilities. The following laws, ordinances, regulations, standards, and policies apply to the protection of cultural and ethnographic resources in California. Projects licensed by the Energy Commission are reviewed for compliance with these laws.

FEDERAL

- National Environmental Policy Act (NEPA): Title 42 United States Code, Section 4321-4327 requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.

- Federal Guidelines for Historic Preservation Projects: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office, refers to these standards in its requirements for mitigation of impacts to cultural resources on public lands in California.

- Section 106 of the federal guidelines sets forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places. The eligibility criteria and the process are used by federal, state and local agencies in evaluating the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the State Register of Historic Resources.

- Executive Order 11593, “Protection of the Cultural Environment,” May 13, 1971, (36 Federal Register, 8921) orders the protection and enhancement of the cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values

- American Indian Religious Freedom Act; Title 42 United States Code, Section 1996 protects Native American religious practices, ethnic heritage sites, and land uses.

- Native American Graves Protection and Repatriation Act (1990); Title 25, United States Code Section 3001, *et seq.* defines “cultural items”, “sacred objects”, and “objects of cultural patrimony”; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for return of specified cultural items

STATE

Please note: The following discussion of California law related to the California Environmental Quality Act (CEQA) was revised in late 1998 and the revised sections, text, and requirements have not yet been incorporated into this analysis.

- Public Resources Code, Section 5020.1 defines several terms, including the following:

  (j) “Historical resource” includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

  (k) “Substantial adverse change” means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

- Public Resources Code, Section 5024.1 establishes a California Register of Historic Places; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures.

- Public Resources Code, Section 5097.5 states that any unauthorized removal or destruction of archaeologic or paleontologic resources on sites located on public land is a misdemeanor. As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority or public corporation, or any agency thereof

- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and the disposition of such materials.

- California Environmental Quality Act (CEQA): Public Resources Code sections 21083.2, 21084.1, *et seq*; require analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.

- California Environmental Quality Act (CEQA) Guidelines: California Code of Regulations, Section 15000, et seq, Appendix G (j)], specifically defines a potentially significant environmental effect as occurring when the proposed project will "...disrupt or adversely affect...a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group;…, site, except as part of a scientific study."

- Public Resources Code, Section 21083.2. The lead agency determines whether a project may have a significant effect on unique archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they can't be avoided, mitigation measures shall be required. The law also discusses excavation as mitigation; discusses the cost of mitigation for several types of projects; sets time frame for excavation; defines "unique and non-unique archaeological resources"; provides for mitigation of unexpected resources; and sets financial limitations for this section.

- Public Resources Code, Section 21084.1: indicates that a project may have a significant effect on the environment if it causes a substantial change in the significance of a historic resource; the section further describes what constitutes a historic resource and a significant historic resource.

- Guidelines for the Implementation of the California Environmental Quality Act,

- Appendix K specifically addresses effects on historic and prehistoric archaeological resources, in response to problems that have arisen in the application of CEQA to these resources.

- Penal Code, Section 622.5: Anyone who damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.

- California Health and Safety Code, Section 7050.5. If human remains are discovered during construction, the project owner is required to contact the county coroner.

- Public Resources Code, Section 5097.98. If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the "Most Likely Descendant" to inspect the burial and to make recommendations for treatment or disposal.

LOCAL

Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies.

CONTRA COSTA COUNTY

One of the goals in the Contra Costa County General Plan is "to identify and preserve important archaeologic and historic resources within the county." The policies related to this goal and set forth in the plan are as follows:

1. Areas which have identifiable and important archaeologic or historic significance shall be preserved for such uses, preferably in public ownership.

2. Buildings or structures that have visual merit and historic values shall be protected.

3. Development surrounding areas of historic significance shall have compatible and high quality design in order to protect and enhance the historic quality of the area. (Contra Costa 1996)

CITY OF PITTSBURG

The General Plan for the City of Pittsburg sets forth goals related to cultural resources: The relevant sections are as follows:

D. To encourage the preservation, protection, enhancement and use of structures that represent past eras, events and persons important in history, or which provide significant examples of architectural styles of the past, or are landmarks in the history of architecture, or which are unique and irreplaceable assets to the city and its neighborhoods, or which provide for this and future generations, examples of the physical surroundings in which past generations lived.

E. To encourage the preservation of varied architectural styles which reflect the cultural, social, economic, political, and architectural phases of the city's history.

F. "To provide for the educational and cultural enrichment of this and future generations by fostering knowledge of our heritage".

The General Plan does not identify any specific measures or requirements for mitigation of potential impacts (Pittsburg 1998).

CITY OF ANTIOCH

Staff for the City of Antioch indicated that Antioch does not have written ordinances or guidelines concerning the protection of cultural resources. City Planning staff indicated they typically rely on environmental documentation provided by project developers (Bendorff 1999).

SETTING

REGIONAL DESCRIPTION

The project is located at the northern end of the Diablo Range of the northern Coast Ranges Physiographic Province of California. The Coast Ranges are characterized by a northwesterly trending series of mountains and valleys. The Diablo Range is dominated by Mt Diablo, which rises 3,849 feet above the surrounding rivers, valleys, and coastal range. The project site is located on relatively flat land, just above sea level, that lies on the southern edge of the delta system below the confluence of two major river systems. These rivers - the Sacramento and the San Joaquin, drain the vast interior, Central Valley of California. Refer to the Project Description section of this Staff Assessment for a regional map of the project development area.

While this part of California has been subjected to a series of climatic fluctuations over the past several thousand years, studies have indicated that the flora and fauna have not changed as dramatically in the project area, as they have in other parts of California. There are three principal plant communities near the project area: Valley Grasslands, Oak Woodland and Chaparral. A fourth vegetation community, Brackish and Freshwater Marsh, exists in lands adjacent to the project area. The Sacramento / San Joaquin Delta was once dominated by this marshy environment, but has now been much reduced to discontinuous patches of marshland as a result of extensive development during this past century (PDEF 1998a, AFC page 5.7-4).

PREHISTORIC SETTING

The archaeological literature indicates that early residents typically lived near water sources that provided them with access to a wide variety of plant and animal resources. The AFC presents archaeological evidence from sites found north of the project area, in Lake County, that indicates native peoples occupied the Clear Lake area as early as 10,000 years ago. Archaeological evidence in the San Francisco Bay area indicates human habitation from as early as 5,000 years ago. Evidence from archaeological sites located close to the proposed project suggests that human occupation may go back to nearly 2,500. Unfortunately most of the evidence of these early occupation sites has been inundated by rising sea levels, covered by alluvial deposits during seasonal flooding of the rivers, and buried by the deposition of extensive sediments during the up-river hydraulic mining efforts in the late 1800s (PDEF 1998a, AFC page 5.7-8).

ETHNOGRAPHIC BACKGROUND

The project area falls within the recorded territory of the Bay Miwok who lived in the area extending from the Suisun Bay to just south of Mount Diablo and eastward to the Sacramento / San Joaquin Delta. The Bay Miwok exploited a wide range of plants and animal resources. They used an extensive inventory of stone tools, baskets and wood and bone implements. They also traded with surrounding groups for obsidian, shell and other ornaments (PDEF 1998a, CRTR pg K 10).

At the time of Spanish contact in the late 1700s, the Bay Miwok were divided into tribelets consisting of several hundred individuals. Each tribelet controlled and exploited the resources within a recognized territory. The tribelet associated with the immediate project area was known as the Chupcan (PDEF 1998a, CRTR pg. K-10).

The native peoples who inhabited the lands bordering the east side of the San Francisco Bay were known as the Coastanoan or Ohlone. Their territory extended around the edge of the Suisun Bay as far as the modern-day town of Crockett and they were neighbors to the Bay Miwok in the project area.

Contact and Early Settlement

Euro-American contact with the native Bay Miwok people first occurred during a series of Spanish expeditions into the area between 1769 and 1776. By 1822, the interests of the Spanish government were replaced by the Mexican government. To protect its holdings, the Mexican government granted large tracts of land to private individuals and by 1845, most of the land holdings were in the form of large ranchos. Rancho Los Medanos, named after the sand hills common in the area, stretched from the San Joaquin River, south towards Mt. Diablo (an area now the site of the modern cities of Pittsburg and Antioch). In 1848 Mexico relinquished California to the United States under the Treaty of Guadalupe Hidalgo. In 1849 the discovery of gold brought an influx of people seeking gold or jobs producing goods or services for gold miners. Land in the region was used to excess as livestock grazed some native grasses to extinction, woodlands were cut for lumber, and railroads, mines and agriculture developed on nearly all arable land (PDEF 1998b, CRTR p. K-12).

VICINITY DESCRIPTION

The proposed project is located in northern Contra Costa County where, in the 1850's, New York Landing (now the City of Pittsburg) and Antioch were founded. The early economy of both areas was based on farming, herding, and trading, although there was no evidence in the literature to indicate that the project site was ever in agricultural use. In 1859 coal was discovered at the base of Mt. Diablo and coal mining had a brief, but important role in the development of Contra Costa County. In the 1860's, railroads were built to transport coal to both the Pittsburg Landing and the New York Landing near Port Chicago. The intersection of the Pittsburg, the San Pablo, and the Tulare railroad alignments, and the country road became known as "Los Medanos Station". There is no indication in the literature that there was ever a structure located at that site (PDEF 1998b, CRTR p. K-12).

Current development in the immediate project vicinity is largely industrial, with a mix of commercial and residential uses nearby. Steel production has been a predominant industry in the area since the 1920s. In 1986 the US Steel facility, which had been recognized as the first hot-dip, tinplate mill west of the Mississippi, became a joint venture between U.S. and Asian steel companies (PDEF 1998a, CRTR p. K-13).

The New York Slough currently serves as an access route to the river delta and the bays. The project area has been the site of industrial facilities for at least 100 years and it seems reasonable to assume that the slough has also been utilized as a shipping route for over 100 years (PDEF 1998b CRTR p. K-12).

Pre-AFC Literature and Records Search

Prior to preparation of the AFC, consultants to the applicant reviewed literature, site records, and maps at the Northeast Center of the California Historical Resources Information System (CHRIS). These reviews are conducted to establish the extent of previous cultural resource surveys and the location of known resources within the project area. The background record search provides a basis from which to predict the archaeological potential of the project area and is also used to provide a context for the evaluation of the significance of known or previously unknown resources that may be affected by the project.

For the PDEF, the search focused on the Area of Potential Effect (APE) for project construction and operation. The APE is defined as the area within 100 feet around the plant site and laydown areas and within 100 feet from the centerline of the routes for all linear facilities. The record search also included adjacent areas located up to 0.25 miles away from the project site and linear routes. Results of the literature review were summarized in Section 5.7 of the AFC and site-specific information was filed with the Energy Commission under separate cover to maintain confidentiality of sensitive resource locations (PDEF 1998a, AFC Section 5.7).

The records showed that eleven archaeological surveys have been conducted in the project area in the last 5 to 20 years but these only covered portions of the proposed project area. The records also indicated there are no previously recorded archaeological sites or built-environment features located within the project APE. The records did show there are seven sites located within 0.25 miles of the project APE but none of these are expected to be impacted by the proposed project (PDEF 1998a, CRTR pg. K-15).

Archaeological Field Surveys

Pre-AFC

An intensive, pedestrian survey of the project area was completed by archaeological resource specialists on April 27, May 1, and May 6 of 1998. Since many of the linear facilities are to be constructed in a highly developed industrial/commercial/residential; zone, survey of the full corridor width was not always possible. Ground visibility varied from poor to excellent, depending upon the current land use. For the project site and laydown area, the surveyors walked in transects 10 to 20 meters apart. For most of the linear facility routes, the surveyors walked over an area 200-feet wide (100 feet on either side of the centerline) wherever possible. Where the routes for project-related linear facilities followed roadways, the surveyors examined any exposed soils on either side of the pavement.

Only one previously unknown site was identified during pre-AFC surveys. The site consists of remnant foundations of an abandoned power plant and a calcineing plant complex. The site was mapped and recorded and the information was filed with the Northeast Center of the CHRIS. The information center denotes sites and isolated finds with a three-part identification number to indicate the state, county, and sequence of the find. If a site has a historic, as well as prehistoric, component to it, the trinomial designation is followed by an "H". The new site found during the surveys is now identified as CA-CCO-715H/P-07-000761. No other cultural resource sites or materials were found during the pre-AFC surveys (PDEF 1998b, CRTR pg. K-15).

POST-AFC

In December 1998 the applicant filed a supplement to the AFC in which some minor changes were made to the original project site layout and some of the linear facility routes. Two new alternative transmission routes and two new alternative utility corridors for pipeline or transmission facility routes were described. Pedestrian surveys were conducted on October 11 and 12, 1998 and no new sites were discovered. The new site, CA-CCO-715H, discovered and recorded during the previous project surveys lies within the 200-foot survey corridor but lies outside the 100-foot APE (PDEF 1998c Supplement pg K.2-3).

ARCHITECTURAL RECONNAISSANCE

Structures older than about forty-five years are potentially significant historic resources in the project area. Wherever possible, the survey team conducted pedestrian surveys of all potential linear facility routes and roadways in the APE to determine whether architecturally significant structures were present and whether the project would potentially affect them. While many industrial buildings and residences were observed during surveys, only the remnants of the calcineing plant appeared to be within the APE but it is unlikely to be directly impacted by the project.

The architectural reconnaissance of the alternative transmission and pipeline routes described in the supplement to the AFC indicate the new transmission route will cross through the existing New York Landing Historical District, listed as of state interest an importance. This district is not expected to be impacted by project construction. Two structures of historic interest, the St Peter the Martyr Church and the Black Diamond School, were noted in the survey reports but they are unlikely to be impacted by construction of an underground transmission line (PDEF 1998a, CRTR pg. K-19; and Supplement pg K3-3).

NATIVE AMERICAN CONTACTS

In the spring of 1998 the consultant to the applicant contacted the state's Native American Heritage Commission (NAHC) to request information on traditional cultural properties such as Native American cemeteries and sacred places in the project area (PDEF 1998a, CRTR p. K-3). The NAHC maintains a list and maps of traditional resource sites located throughout the state. The Heritage Commission also can refer staff, applicants, consultants, and members of the public to registered Native

American representatives who can assess the potential for a specific project to impact Native American sites or values in various parts of the state.

In response to the consultant's request, the NAHC indicated that no known sacred properties were located within the project area, but this information often remains protected. In its response, the NAHC provided a list of Native American contacts of primarily Miwok and Costanoan / Ohlone heritage. A summary of the contacts and a sample of the letter sent to the Native American's is provided in Appendix D of the confidential Cultural Resources Technical Report, (PDEF 1998b, CRTR p. K-49). As of June 1998, no response to the applicant's inquiry had been received from representatives of the Native American community.

PROJECT DESCRIPTION

Please refer to the **Project Description** section for a detailed description of the project and related facilities, and a project site map and facility layout.

IMPACTS

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed PDEF project has the potential to adversely affect previously unknown cultural resources. Impacts to cultural resources may result either directly or indirectly during the pre-construction, construction, and operation of the project. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, or excavation. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource materials due to improved accessibility.

Based upon the California Environmental Quality Act (CEQA), the Warren-Alquist Act, and Energy Commission siting regulations, the Commission staff must evaluate the potential for significant impacts from a proposed project on sensitive cultural resources. The significance of any cultural resources materials recovered during project construction is determined by a qualified cultural resource specialist, based upon established criteria.

SIGNIFICANCE CRITERIA FOR CULTURAL RESOURCES

Significant cultural resources are those that meet established scientific criteria which are generally accepted by professional archaeologists, historians, and cultural resource specialists. Under federal law, the criteria for determining a significant impact to cultural resources differs from that of state law.

FEDERAL CRITERIA

Title 36 Code of Federal Regulations, section 60.41, sets forth the following criteria for determining eligibility for the National Register of Historic Places:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that also:

(a) are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) are associated with the lives of persons significant in our past; or

(c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction; or

(d) have yielded or may be likely to yield information important in history or prehistory.

STATE CRITERIA

CEQA indicates that a project will have a significant adverse effect if it impacts "unique" archaeological resources which is a category that is narrowly defined by statute. (Public Resources Code, section 21083.2).

- "Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information";
- "Has a special and particular quality such as being the oldest of its type or the best available example of its type";
- "Is directly associated with a scientifically recognized important prehistoric or historic event or person."

Title 14 of the California Code of Regulations, Section 15064.5(e) defines "Historic resources" to include archaeological resources, and is more encompassing that the resources protected according to their "unique" status

Section 21084.1 of the Public Resources Code would require a finding of significant impact for any project that may have a "substantial adverse change" on the historical significance of a "historic resource" which is defined to include those archaeological resources that are either listed on or eligible for listing on the California Register of Historic Resources. Such adverse changes include demolition, destruction, relocation, or alteration of the resource [California Code of Regulations, Title 14, Section 15064.5 (b)(1).]

Generally, a resource is considered to be "historically significant" if the resource meets the following criteria for listing in the California Register of Historic Resources:

(1) It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(2) It is associated with the lives of persons important in our past;

(3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;

(4) It has yielded, or may be likely to yield, information important in prehistory or history [California Code of Regulations, Title 14, Section 15064.5(a)(3)].

THE POTENTIAL FOR IMPACTS TO CULTURAL RESOURCES

The determination of potential impacts to cultural resources from the proposed PDEF is required by the Siting Regulations of the California Energy Commission (Energy Commission) and by the California Environmental Quality Act (CEQA). Impacts to cultural resources may result either directly or indirectly during pre-construction or construction of the project. As described in the AFC, the potential for significant project impacts to cultural resources is directly related to the likelihood that such resources are present and whether they are actually encountered during project development activities. A determination of the potential for discovery of cultural resources is based on the results of the literature review and field surveys. Basically, the more cultural resource sites and materials reported in an area, the greater the potential for future discoveries in the vicinity.

The confidential Cultural Resources Technical Report indicates there is one previously recorded prehistoric site that consisted of grinding implements, located outside the 0.25 mile radius of the APE. There also are eight historic-era buildings or locations located within the 0.25 mile radius of project components. The presence of numerous sites of historic interest and evidence of human habitation in proximity to the proposed project APE indicate a possibility to encounter sub-surface cultural resource materials during construction (PDEF 1998b, pg K-1, K-8, and pg K-15).

Often the potential for cultural resources to be found during project construction activities remains uncertain until the ground surface has been broken and excavation of sub-surface soils takes place. Staff's objective is to ensure that there will be no adverse impacts to significant or unique cultural resource materials during project development and construction.

POWER PLANT SITE

The power plant site is located within the city of Pittsburg. It will be located on an existing industrial site and the entire general project area is in a residential and heavily industrialized location. The possibility of disturbing resources is diminished

because this site has been utilized as an industrial area for approximately 100 years (PDEF 1998a, CRTR p K-5).

Water Supply

The proposed 16” pipeline to supply water to the project would be built under or immediately adjacent to existing paved roads. With the exception of a portion of the route running parallel to Columbia Street and the portion which crosses the open lands of the USS-POSCO property north of the Pittsburg-Antioch Highway, the route will be above ground. No cultural resources were observed during four previous surveys nor during the pre-AFC survey (PDEF 1998b, pg K-23).

Electric Transmission Line Route(s)

The AFC indicates that the ground surface along the transmission line corridor is comprised of imported fill or has been subject to extensive disturbance from industrial, commercial, and residential development. Approximately 1 mile of Route 10 will be above ground and approximately 1 mile will be underground. All 1.2 miles of Route 11 will be above ground (PDEF 1998a, AFC page 3.5-5).

For the above ground portions of the route, construction of foundations for the transmission line power poles will require drilling of the soil to variable depths for each power pole. The depth of soil disturbance will depend on the height and diameter of the individual transmission poles designed for each portion of the route. It is likely the width and extent of surface soil disturbance would depend upon the size of equipment needed to set and erect the poles for the above ground portion of the transmission line.

For the underground portions of the transmission routes, trenches of six feet deep would be opened to accommodate electrical cables and cooling fluid lines and to construct concrete access structures to house the pump stations for the transmission and cooling fluids. Transition towers and stations would be constructed at each point where the transmission lines go from above ground to underground, and vice versa.

While no surface evidence of cultural resource materials was observed during the surveys for the transmission line routes, the presence known historic resources and evidence of long time prehistoric habitation of the Pittsburg/Antioch area indicates a potential for cultural resource materials to be encountered. The depth to undisturbed soils underlying the route is unknown, so the potential for impacts cannot be fully evaluated until the sub-surface soils are exposed during augering for power pole foundations. Where not previously disturbed, the soils may provide evidence of previous habitation. The potential for impacts cannot be fully evaluated until the sub-surface soils are excavated for foundation footings and the soils are examined for evidence of cultural resources.

Natural Gas Pipeline Routes

The gas pipeline, as described, will not indirectly impact any built feature older than 45 years (PDEF 1998a, AFC page 5.7-23). It will be 3.6 miles long and 20 inches wide.

Considerable surface disturbance may occur as trenches for this underground pipeline are dug. For boring under ditches and roads, additional work space may be cleared at the points of entry and exit for the equipment. However, since the majority of the length of the pipeline is located on land underlain by imported fill or previous development, it is unlikely there would be impacts to cultural resources on or immediately below the surface (PDEF 1998a, AFC page 5.7-22).

The pipeline will be buried in a trench approximately 2 feet wide and 5 feet deep. Most of the pipeline will be constructed on vacant land covered with fill or on lands that are paved or otherwise disturbed by development. However, the potential for impacts to previously unknown cultural resources cannot be fully evaluated until the sub-surface is exposed by trenching. Given the evidence of previous human occupation and use of the lands in the project area, the excavation associated with the pipelines to be constructed for this project has a potential to impact cultural resources (PDEF 1998b, pg K-8).

CUMULATIVE IMPACTS

While the total area affected by the PDEF project appears small in comparison to the vastness of the entire coast range of mountains in northern California, the cultural resource materials found in the project area can provide valuable information on environmental conditions and human adaptations to an earlier, environmental conditions. Proposed developments reaching wider and deeper into the coast range and river delta areas can accelerate the potential for loss of significant cultural resource information. The level of cumulative impact will increase as increasing development opens more undisturbed areas and eventually exposes highly sensitive cultural resource sites.

FACILITY CLOSURE IMPACTS

PLANNED CLOSURE

The anticipated lifetime of the PDEF project is expected to be at least of twenty-five years. Upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty or (2) A planned, orderly closure that would occur at the end of the plant's useful mechanical life. At the time of closure, all then-applicable LORS will be identified and the closure plan will address compliance with these LORS.

Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are more likely to depend upon the final location of project structures in relation to existing resources, and then upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no final conclusion can be drawn at this time with respect to the impact of permanent facility closure on cultural resources.

Unexpected Temporary Closure

A temporary unplanned closure would be likely to occur in response to an emergency. No impacts to cultural resources are expected from an unexpected temporary closure.

Unexpected Permanent Closure

If a site were abandoned, impacts to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on possible soil disturbance, some impacts on cultural resources might result.

MITIGATION

As discussed in the AFC, no archaeological cultural resource materials were found on the surface during pre-AFC reconnaissance surveys of areas potentially affected by the PDEF project construction and operation. The presence of cultural resource materials beneath the surface of the project area is difficult to determine until the ground is opened by excavation, trenching, or augering, so the extent of potential impacts can not easily be evaluated prior to construction.

As also discussed in the AFC, numerous historic cultural resources, most of undetermined significance were identified near the project area.

There is a potential for the discovery of sub-surface cultural resource materials in several portions of the project area. Since project development and construction usually entail disturbance of the ground surface, as well as disturbance below the surface, the proposed PDEF project has the potential to adversely affect cultural resources. Staff's objective is to ensure that there will be no adverse impacts to significant cultural resources occur during project development and construction. This goal can be achieved by avoiding, wherever possible, any project-related disturbance of cultural resource sites. Should impacts to significant cultural resources be unavoidable, CEQA may require the Commission to make a finding of over-riding considerations.

Staff has recommended a series of conditions of certification that would help ensure necessary mitigation of impacts if previously unknown cultural resources are encountered during project construction. Critical to the success of any mitigation efforts is the selection of a qualified professional cultural resources specialist. The Commission staff must review the qualifications and approve of the professional archaeologist designated by the project owner to lead and participate in project monitoring and mitigation efforts.

Mitigation measures are developed to reduce the potential for adverse project impacts on the region's cultural resources to a less than significant level. The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the US Secretary of Interior guidelines, the Commission staff recommendations, and the policies and

guidelines of Contra Costa County, the City of Pittsburg and the City of Antioch. All of these mitigation measures have previously proven successful in protecting sensitive cultural resources from construction-related impacts, while allowing the timely completion of many projects throughout California.

Commission staff has proposed contingency mitigation measures which are to be implemented if sensitive cultural resources are encountered during pre-construction site preparation or in such activities as coring, boring, augering, excavation, and trenching during project construction.

APPLICANT'S PROPOSED MITIGATION

The AFC indicates that several prehistoric and numerous historic sites have previously been found near the project area and there is a possibility that sub-surface excavation for project construction could encounter additional sub-surface cultural resource materials. Since there is evidence of continuous habitation of prehistoric and historic settlement along the Coast Range foothills and the sloughs in the Pittsburg area, these would be the most likely places to find sub-surface cultural resources. In confidential Appendix K, the applicant states that any initial grading or excavation within 100 feet of any potentially significant resource that may have a subsurface component should be monitored by an archaeologist. If subsurface materials are uncovered, construction work in the immediate vicinity is to be halted and the emergency discovery procedures described below will be implemented (PDEF 1998a, CRTR page-39).

As set forth in the AFC, the applicant assumes that all the recorded sites that have not been formally evaluated for significance/importance are at a minimum an "important" resource under CEQA, Appendix K or are potentially eligible for listing on the NRHP under 36 CFR 60.4 (d) "potential to yield data important to history or prehistory" (PDEF 1998b, pg K-38). The AFC also indicates that avoidance, irrespective of potential site significance, is an integral part of the engineering design for PDEF. The applicant has recommended that a six-point cultural resource-monitoring program should be implemented for areas of high sensitivity. The steps in this program are listed here and are more fully represented in the proposed conditions of certification. Basically, the proposed six-point program would include:

- Avoidance
- Physical Demarcation and Protection
- Crew Education
- Archaeological Monitoring
- Native American Monitoring
- Formal Compliance with CEQA Appendix K/Section 106 (PDEF 1998a, CRTR page K-38 to K-39)

LOCAL REQUIRED MITIGATION

No information was available concerning the requirements of Contra Costa County. If appropriate, this information will be provided in the FSA.

STAFF'S PROPOSED MITIGATION MEASURES

Staff concurs with the mitigation measures proposed by the applicant in the AFC and with the measures required by local agencies. Staff has suggested additional language to clarify the measures presented by the applicant and the agencies.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The project area is located in Contra Costa County, along the southern edge of the Sacramento / San Joaquin river delta, near the entry to the Suisun and San Francisco bays. Archaeological evidence indicates that California has been occupied by humans for many thousands of years. These early occupants had well established patterns of seasonal hunting and resource collection throughout the Bay and Delta regions. They also had established trade routes extending from the ocean coastal areas, inland to and through the sloughs and delta toward the interior tribes along the rivers and in the coastal mountain ranges. Many of the resource and trade routes established by the native peoples of California were later used by the Euro-American explorers and settlers as they spread across California. Eventually these early routes provided the foundation for modern-day highways and the railroads.

Several prehistoric sites and numerous historic sites have been recorded within one mile of the project site. The presence of known sites provides evidence of the prehistoric occupation and use by the native peoples of California, as well as the more recent succession of historic occupation and development. And the presence of known sites also indicates there is a possibility that project construction could encounter potentially significant cultural resources.

Cultural resources are significant to our understanding of our culture, our history and heritage and they can also provide insight into the broader patterns of human adaptation to environmental change. Evidence of California's early occupation is becoming increasingly vulnerable to the ongoing development and urbanization of the state. Staff's primary concern is to ensure that all potential impacts are identified and that mitigation conditions are set forth to ensure that no significant adverse impacts will occur.

If the conditions of certification proposed by the Staff are implemented in a timely and proper manner by qualified cultural resource professionals, the project is expected to be in compliance with the applicable LORS.

RECOMMENDATIONS

Staff recommends that the Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above, to ensure adequate mitigation of potential impacts to sensitive cultural resources during the construction of the Pittsburg District Energy Facility.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Project construction (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), shall not begin until the designated cultural resources specialist approved by the California Energy Commission (Commission) Compliance Project Manager (CPM), is available to be on site.

The designated cultural resources specialist shall be responsible for implementing all the Conditions of Certification and for using qualified personnel to assist him or her in project-related activities. The designated specialist, with assistance from qualified team members as needed, shall conduct the following activities:

- any final pre-construction surveys, flagging of areas to be avoided, and identification of areas where shovel testing, test pits, or backhoe trenching need to be done;
- preparation and implementation of the Cultural Resources Monitoring and Mitigation Plan;
- preparation and presentation of the pre-construction employee awareness training program;
- maintenance of a daily log of cultural resource monitoring and mitigation activities and preparation of a summary of these activities to be included in the weekly construction status report filed with the CPM;
- direction and implementation of monitoring and mitigation procedures, as needed in sensitive resource areas, during any construction activities associated with all aspects of the project;
- implementation of measures to map, record, sample, and collect sensitive and diagnostic cultural resources;
- preparation and analyses of all data and cultural materials recovered during project monitoring and mitigation;
- identification and inventory recovered cultural resources;
- preparation of recovered cultural resources for delivery and curation to a qualified public repository;
- delivery of recovered cultural materials to the curation institution; and
- preparation of the preliminary and final cultural resources reports to be filed with the receiving curation repository, appropriate regional information center(s), SHPO, and the Commission.

Protocol: 1) The resume for the designated cultural resource specialist shall include all information needed to demonstrate that the specialist meets the minimum qualifications specified in the US Secretary of Interior Guidelines, as published by the State Office of Historic Preservation (1983). The Commission staff expects that these minimum qualifications would include the following: a graduate degree in anthropology, archaeology, California history, cultural resource management, or other comparable fields; at least three years of archaeological resource mitigation and field experience in California; and at least one year's experience in each of the following areas: leading archaeological resource field surveys; leading site and artifact mapping, recording, and recovery operations; marshalling and use of equipment necessary for cultural resource recovery and testing; preparing recovered materials for analysis and identification; recognizing the need for appropriate sampling and/or testing in the field and in the lab; directing the analyses of mapped and recovered artifacts; completing the identification and inventory of recovered cultural resource materials; and the preparation of appropriate reports to be filed with the receiving curation repository, the SHPO, all appropriate regional archaeological information center(s), and the CPM.

2) The resume for the designated cultural resource specialist shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

Verification: At least ninety (90) days prior to the start of construction on the project, the project owner shall submit the names and resumes for its designated cultural resource specialist and the specialist's team members, to the CPM for review and written approval. The CPM shall provide approval or disapproval of the proposed cultural resource specialist.

At least ten (10) days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated cultural resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist?

CUL-2 Prior to the start of project construction, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings showing the final project design and site layout, and the final alignment of all linear facilities. The routes for the linear facilities shall be provided on 7.5 minute quad maps, showing post mile markers, final center lines and right-of-way boundaries, and the location of all the various areas where surface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, switchyards, electrical tower or pole footings, etc.

The designated cultural resource specialist may request, and the project owner shall provide, enlargements of portions of the 7.5 minute maps presented as a sequence of strip maps for the linear facility routes. The strip maps would show post mile markers and the detailed locations of proposed access roads, storage or laydown sites, tower or pole footings, and any other areas of disturbance associated with the construction and maintenance of linear facilities.

Verification: At least ninety (90) days prior to the start of construction on the project, the project owner shall provide the designated cultural resource specialist and the CPM with final drawings and site layouts for all project facilities and maps at appropriate scale(s) for all areas potentially affected by project construction.

CUL-3 Prior to the start of project construction, the designated cultural resources specialist shall prepare a draft Cultural Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive cultural resources. The CPM will review and must approve in writing, the Cultural Resources Monitoring and Mitigation Plan. After CPM approval, the project owner's designated cultural resource specialist and designated cultural resource team shall be available to implement the Monitoring and Mitigation Plan, as needed throughout project construction.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but mot be limited to, the following elements and measures:

a. A discussion of the implementation sequence and the estimated time frames for project-related tasks, such as any final pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; preparation of a research design; cultural resource preparation and recovery; preparation of data and recovered materials for analysis, identification, and inventory; preparation of preliminary and final reports; and preparation of materials for curation.

b. An identification of the person(s) expected to assist with each of the tasks identified in (a), above, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities.

c. A discussion of the need for Native American observers or monitors, the procedures to be used to select them, the areas or post-mile sections where they will be needed, and their role and responsibilities.

d. A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the post-mitigation analyses.

e. Discussion of measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided

during construction and/or operation, and a discussion of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

f. Where monitoring of project construction activities is deemed necessary by the designated cultural resource specialist, the specialist will determine the size or extent of the areas where monitoring is to occur and will establish a schedule for the monitor(s) to be present. If the designated specialist determines that the likelihood of encountering cultural resources in certain areas is slight, monitoring may be discontinued in that location;

g. The designated cultural resource specialist shall be present to monitor construction-related grading, excavation, trenching, and/or augering in the areas of known site CA-CCO-715H. Monitoring shall extend to all areas where there is no imported fill or where construction activity will extend below the level of imported fill.

h. The designated cultural resource specialist will ensure that the excavation spoils and exposed sidewalls of the trenches for the reclaimed water pipeline and the fuel gas pipeline will be monitored intermittently for evidence of sub-surface cultural resources.

i. The designated cultural resource specialist shall have the authority to halt or redirect construction if previously unknown midden deposits or cultural resource materials are encountered during project-related grading, augering, excavation and/or trenching. The halting or redirection of construction shall remain in effect until the designated cultural resources specialist has notified the CPM of the find and the work stoppage, and until the necessary data recovery and mitigation has been completed. After construction is halted or redirected, the designated cultural resources specialist shall act in accordance with the following procedures:

- The designated cultural resources specialist, representatives of the project owner, and the CPM shall confer within five working days of the notification of the CPM, if necessary, to discuss any mitigation measure(s) already implemented or proposed to mitigate potential impacts to these resources.

- If previously unknown cultural resources are encountered, the designated cultural resource specialist and team members shall monitor construction activities and implement data recovery and mitigation measures, as needed

- If midden deposits are exposed during ground clearance or excavation, then construction activities are to be halted and the construction area is to be spot-checked or monitored by the designated cultural resources

specialist to determine whether cultural resources are present in the deposit

- All necessary and required data recovery and mitigation shall be completed as expeditiously as possible after discovery of any previously unknown cultural resources, unless additional time is agreed to by all parties.

j. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping and recovery of cultural resource materials.

k. All cultural resources encountered will be recorded and mapped (may include photos) and all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum that meets the US Secretary of Interior standards and requirements for the curation of cultural resources.

l. dentification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for the materials to be delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution.

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the draft Cultural Resources Monitoring and Mitigation Plan prepared by the designated cultural resource specialist. If the draft plan is not approved, the project owner, the designated cultural resources specialist, and the CPM shall meet to discuss comments and work out necessary changes.

CUL-4 Prior to the start of project construction, the designated cultural resources specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and written approval.

Protocol: The training program will discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training program shall also include the set of reporting procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program will be presented by the designated cultural resource specialist and may be combined with other training programs prepared for biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall submit to the CPM (or designee) for review,

comment, and written approval, the proposed employee training program and set of reporting procedures the workers are to follow if previously unknown cultural resources are encountered during construction.

The CPM shall provide the project owner with written approval or disapproval of the employee training program and set of reporting procedures. If the draft employee training program is not approved, the project owner, the designated cultural resources specialist, and the CPM shall meet to discuss comments and work out necessary changes.

CUL-5 Prior to the start of construction and throughout the project construction period as needed for all new employees, the project owner and the designated cultural resource specialist shall provide the CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance.

Verification: Prior to the start of construction and throughout the project construction period as needed for all new employees, the project owner and the designated cultural resources specialist shall present the CPM-approved training program on the potential for project impacts to sensitive cultural resources. The training shall include a set of reporting procedures for cultural resources encountered during project activities. The project owner shall provide documentation to the CPM that the employee training and the set of procedures have been provided to all project managers, construction supervisors, and all workers.

CUL-6 Throughout the project construction period, the project owner shall provide the designated cultural resource specialist with a current schedule of anticipated weekly project activity and a map indicting the area(s) where construction activities will occur. The designated cultural resources specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Throughout the pre-construction reconnaissance surveys and the construction monitoring and mitigation phases of the project, the designated cultural resources specialist shall keep a daily log of any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The designated resource specialist may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

The project owner shall include copies of the cultural resources weekly progress or status summaries in the project owner's weekly Construction Status Report to the CPM.

Verification: Throughout the project construction period, the project owner shall include in the Monthly Compliance Reports to the CPM, a summary of the daily logs

prepared by the designated cultural resource specialist on the progress or status of cultural resource monitoring and mitigation activities.

CUL-7 The designated cultural resource specialist shall be present at all times to monitor construction-related grading, excavation, trenching, and/or augering in the vicinity of previously recorded archaeological sites and in areas where midden deposits have been identified during project construction.

If the designated cultural resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner of the changes. Mile post markers and boundary stakes placed by the project owner will be used to identify areas where monitoring is being reduced or is no longer deemed necessary.

The daily logs prepared by the designated cultural resource specialist shall indicate by post mile, where and when monitoring has taken place and where monitoring has been deemed unnecessary.

Verification: The project owner shall include in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated cultural resource specialist.

CUL-8 The project owner shall ensure the recovery, preparation for analysis, analysis, and preparation for curation of all cultural resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum(s), university(ies), or other appropriate research specialists which will ensure the necessary recovery, preparation for analysis, and analysis of cultural resource materials collected during data recovery and mitigation for the project. The project owner shall keep these files available for periodic audit by the CPM.

CUL-9 The project owner shall ensure preparation of a Preliminary Cultural Resource Report following completion of data recovery and site mitigation work. The preliminary report is to be prepared by the designated cultural resource specialist and the project owner shall submit the preliminary report to the CPM for review, comment, and written approval.

Protocol: The preliminary report shall include (but not be limited to) preliminary information on the survey report(s), methodology, and recommendations; site records and maps; determinations of sensitivity and significance; data recovery and other mitigation activities; discussion of possible results and findings of any analysis to be conducted on recovered cultural resource materials and data; proposed research questions which may be answered or raised by the data recovered from the project; and an

estimate of the time needed to complete the analysis of recovered cultural resource materials and prepare a final report.

If no cultural resources were recovered during project construction, the CPM-approved Preliminary Cultural Resources Report shall also serve as the final report and shall be filed with appropriate entities, as described in conditions CUL-11 and CUL-12, below.

Verification: The designated cultural resources specialist shall prepare a preliminary report on the cultural resource monitoring and mitigation activities conducted for the project. The report shall be prepared within ninety (90) days following completion of the data recovery and site mitigation work. The project owner shall submit a copy of the Preliminary Cultural Resources Report to the CPM for review, comment, and written approval.

CUL-10 The project owner shall ensure the preparation of a Final Cultural Resources Report by the designated cultural resources specialist, if significant or diagnostic cultural resources are found. The Final Cultural Resource Report shall be completed within ninety (90) days following completion of the analysis of the recovered cultural materials and related information. The project owner shall submit the final cultural resources report to the CPM for review, comment, and written approval.

Protocol: The Final Cultural Resource Report shall include (but not be limited to) the survey report(s), methodology, and recommendations; site records and maps; description and inventory list of recovered cultural materials; determinations of significance and potential eligibility; data recovery and other mitigation activities; results and findings of any special analyses conducted on recovered cultural resource materials and data; research questions answered or raised by the data from the project; and the name and location of the public institution receiving the recovered cultural resources for curation.

Verification: The Final Cultural Resource Report shall be prepared by the designated cultural resources specialist for the project, within ninety (90) days following completion of the analysis of the recovered cultural materials and preparation of related text, maps, tables, charts, photos, etc. The project owner shall submit a copy of the final cultural resources report to the CPM for review and approval.

CUL-11 The project owner shall submit an original, or an original-quality, copy of the CPM-approved Final Cultural Resource Report to the public institution receiving the recovered data and materials for curation, to the SHPO, and to the appropriate regional archaeological information center(s). A legible copy of the approved final report shall be filed with the Commission CPM, with a request for confidentiality, if needed to protect any sensitive resources or sites.

Protocol: The copies of the Final Cultural Resource Report to be sent to the curating institution, the SHPO, and the regional information center(s)

shall include the following (as applicable to the project findings set forth in the final report): clean and reproducible original copies of all text; originals of any topographic maps showing site and resource locations; original or clear copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys, during project-related monitoring, data recovery, and mitigation; and photographs (including a set of negatives, if possible) of the site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation.

Verification: The project owner shall maintain in its compliance files, copies of all documentation related to the filing of the original materials and the Commission-approved Final Cultural Resources Report with the public institution receiving the recovered data and materials for curation, the SHPO, and the appropriate archaeological information center(s). If no significant cultural resources were recovered, then the preliminary report shall serve as the final report and copies of the preliminary report shall be filed with these same agencies.

CUL-12 Following the filing of the CPM-approved Final Cultural Resource Report with the appropriate entities, the project owner shall deliver for curation all cultural resource materials, maps and data collected during data recovery and mitigation for the project. The materials shall be delivered for curation into a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources.

Verification: All recovered cultural resource materials shall be delivered for curation within thirty (30) days following the filing of the CPM-approved Final Cultural Resource Report. The project owner shall maintain in its project history or compliance files, copies of signed contracts or agreements with the museum(s), university(ies), or other appropriate public repository(ies) to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

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SOCIOECONOMIC RESOURCES

Testimony of Amanda Stennick

INTRODUCTION

The technical area of socioeconomics encompasses several related areas of interest and concern. A typical socioeconomic impact analysis evaluates the effects of project-related population changes on local schools, medical and protective services, public utilities and other public services, the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes in population, and the issue of environmental justice. This analysis discusses the potential effects of the proposed Pittsburg District Energy Facility (PDEF) on local communities, community resources, and public services, pursuant to Title 14 California Code of Regulations, Section 15131.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

CALIFORNIA GOVERNMENT CODE §§ 53080, 65955-65997

The code includes provisions for levies against development projects near schools. The administering agency is the Pittsburg Unified School District.

ENVIRONMENTAL JUSTICE

President Clinton's Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed on February 11, 1994. The order required the US Environmental Protection Agency (USEPA) and all other federal agencies to develop environmental justice strategies. The USEPA subsequently issued Guidelines that require all federal agencies and state agencies receiving federal funds, to develop strategies to address this problem. The agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

ENVIRONMENTAL JUSTICE SCREENING ANALYSIS

For all siting cases, Energy Commission staff will follow the federal guidelines' two-step screening process. The process will assess:

- whether the potentially affected community includes minority and/or low-income populations; and
- whether the environmental impacts are likely to fall disproportionately on minority and/or low-income members of the community.

Depending on the outcome of the screening process, local community groups will be contacted to provide the Energy Commission with a fuller understanding of the

community and the potential environmental justice issues. In addition, local community groups will be asked to help identify potential mitigation measures.

SOCIOECONOMICS Table 1 contains demographic information for census tracts within 1.5 miles of the project site. Data for this table were taken from the 1990 US Census Data, as specified in the USEPA Guidelines (guidelines) for use in an environmental justice analysis (USEPA 1996). Energy Commission staff is aware that data from the 1990 Census may not accurately represent the 1998 population. Census estimates and projections are done only on a countywide basis and the most recent data is for the year 1994 (Heim, Doche, Choi, Scheuermann 1998). There are inherent problems with using countywide population projections for 1994. For purposes of analyzing environmental justice issues, the PDEF study area comprises certain census tracts within Pittsburg. Using countywide data could artificially inflate or dilute the presence of affected minority and/or low-income populations. It is for this reason that Energy Commission staff is using demographic data from census tracts within 1.5 miles of the PDEF to determine the presence of minority and / or low-income populations.

Energy Commission staff is aware that population shifts since the 1990 US Census may indicate the presence of affected minority and/or low-income populations in the PDEF area. If members of the community believe there may be potential environmental justice issues, Energy Commission staff will work with the community using non-traditional data gathering techniques, including outreach to community-based organizations to identify distinct minority and/or low-income populations living within the PDEF area.

According to the guidelines, a minority population exists if the minority population percentage of the affected area is fifty percent or greater than the affected area's general population. Based on the screening process for environmental justice, information in **SOCIOECONOMICS Table 1** indicates that the minority population of the affected area is not greater than fifty percent of the general population. Therefore, because the minority population is less than fifty percent, there appears to be no potential minority population based environmental justice issues in the PDEF area.

The poverty threshold for a family of four persons was $12,674 (1990 US Census Data). To determine the number of persons below the poverty level, Energy Commission staff reviewed data from the 1990 US Census: Poverty Status By Age; Universe: Persons for whom poverty status is determined (the aggregate number of persons five years and under to seventy-five years and over). **SOCIOECONOMICS Table 2** indicates that the total number of people living below the poverty level is 7,957, which is about 12 percent of the total population of the census tracts within 1.5 miles of the PDEF site.

As stated above, a minority population exists if the minority population percentage of the affected area is fifty percent or greater than the affected area's general population. Because the guidelines do not give a percentage of the population as a threshold to determine the existence of a low-income population, Energy Commission staff used the fifty percent rule as required for minority populations.

Because the low-income population is less than fifty percent, there appears to be no potential low-income population based environmental justice issues in the PDEF area.

SOCIOECONOMICS Table 1
Demographic Profile for Census Tracts Within 1.5 Miles of the PDEF Site

Census Tract	Hispanic Origin	White	Black	American Indian	Asian Pacific Islander	Other Race	Total by Tract
3090	500	756	729	7	79	0	2,171
3100	1,837	1,244	696	27	145	10	3,959
3110	1,749	1,228	663	17	451	5	4,024
3120	93	555	1,324	0	241	16	2,229
3131-01	1,258	3,647	962	35	620	18	6,540
3131-02	593	2,117	641	29	363	0	3,743
3131-03	816	3,254	500	23	463	4	5,060
3132-01	1,693	2,973	1,299	34	1,191	0	7,120
3132-02	1,604	4,169	768	57	997	0	7,595
3050	1,763	3,695	158	88	139	22	5,865
3072-01	558	2,141	168	14	158	6	2,487
3072-02	802	2,565	287	27	135	26	3,842
3072-04	614	3,020	51	45	130	3	3,813
3072-05	904	4,876	218	33	289	0	6,320
Totals	**14,784**	**36,240**	**8,394**	**436**	**5,329**	**110**	**64,768**
% of Totals	23%	56%	13%	<1%	8%	<1%	100%
Source: 1990 US Census Data, Statistical Information on Population							

SOCIOECONOMICS Table 2
Percentage of Persons Living Below the Poverty Level Within 1.5 Miles of the PDEF Site

Census Tract	Number of Persons in Tract	Persons Below Poverty Level
3090	2,171	437
3100	3,959	806
3110	4,024	551
3120	2,229	445
3131-01	6,540	611
3131-02	3,743	142
3131-03	5,060	203
3132-01	7,120	702
3132-02	7,595	705
3050	5,865	1,228
3072-01	2,487	331
3072-02	3,842	877
3072-04	3,813	101
3072-05	6,320	818
Totals	**64,768**	**7,957**

Source: 1990 US Census Data, Statistical Information on Population

SETTING

PROJECT LOCATION

The project site is located in the eastern industrialized portion of Pittsburg. Pittsburg is located on the Delta coastline in north central Contra Costa County. Antioch is about two miles east. For purposes of evaluating potential socioeconomic impacts, the applicant has defined the study area as a four-county area that includes Contra Costa, Solano, Alameda, and San Joaquin Counties: four counties within an hour's commuting distance of the project (PDEF 1998). While the study area comprises this four-county area, the applicant has stated that due to the high degree of urbanization of the study area, the cities of Pittsburg and Antioch are expected to receive the majority of the socioeconomic impacts generated by the project. For purposes of the Final Staff Analysis (FSA), Energy Commission staff will consider the cities of Pittsburg and Antioch as the study area, and will expect

that these cities will experience the majority of socioeconomic impacts generated by the project.

DEMOGRAPHY

Population figures and estimates for Pittsburg and Antioch are summarized in **SOCIOECONOMICS Table 3**, which shows the county's population is expected to increase by about 30 percent by the year 2020. This projected growth is higher than any other county in the nine-county Bay Area (ABAG 1998). Population growth is due to the availability of developable land for new housing and the affordability of housing relative to other Bay Area Counties (PDEF 1998).

SOCIOECONOMICS Table 3
Total Population in Project Area

City/County	1990	1997	2010	2020
Pittsburg	47,564	50,800	85,000	97,000
Antioch	62,195	76,500	106,000	1,139,600
Contra Costa County	803,732	879,200	1,049,600	1,139,600

Source:1990 Census; ABAG 1998; SJCOG 1998

EMPLOYMENT

California Employment Development Department (EDD) data provided in the Application for Certification (AFC) estimated the civilian labor force available in Pittsburg as 25,930, and Antioch as 35,050. Total labor force in the county is about 475,000. **SOCIOECONOMICS Tables 4 and 5** show the 1998 Average Annual Area Employment and 1998 Estimated Construction Employment, respectively.

The project is expected to employ a maximum of 294 construction workers. Specific trades required for construction include carpenters, laborers, ironworkers, finishers, operators, pipefitters, electricians, millwrights, boilermakers, insulators, painters, teamsters, and others. Operation of the plant is expected to employ about 20 employees, including plant managers, engineers, supervisors, maintenance personnel, secretarial and clerk support staff (PDEF 1998). Based on employment information obtained from **SOCIOECONOMICS Tables 4 and 5**, there appears to be a surplus of construction and utility workers available to staff the construction and operation of the project (for data on employed labor by craft please refer to **SOCIOECONOMICS Tables 8 and 9**).

SOCIOECONOMICS Table 4
1998 Average Annual Area Employment

	Civilian Labor Force	Employed Labor Force	Unemployed Labor Force	Unemployment Rate
Pittsburg	25,930	24,550	1,380	5.3%
Antioch	35,050	33,290	1,760	5.0%
Contra Costa Co.	474,600	456,700	17,900	3.8%
Source: California Employment Development Department, Labor Market Information Division				

SOCIOECONOMICS Table 5
1998 Estimated Construction Employment

	1998 Total Employment	Estimated Percent Construction	Estimated Construction Employment
Contra Costa/Alameda Counties	1,134,200	4.3%	48,400
Solano County	170,200	6.0%	10,200
San Joaquin County	217,500	3.12%	6,800
Source: California Employment Development Department, Labor Market Information Division			

HOUSING AVAILABILITY

SOCIOECONOMICS Table 6 presents housing information for Pittsburg and Antioch. Housing characteristics provided in the AFC indicate that in 1997 Pittsburg had 17,52 dwelling units. Antioch had 28,083 dwelling units. Housing growth in the 1990s is due to the availability of developable land for new housing and the affordability of housing relative to other Bay Area Counties. In addition to dwelling units, there are an estimated total of 519 motel/hotel units in Pittsburg and Antioch (PDEF 1998).

SOCIOECONOMIC Table 6
HOUSING AVAILABILITY

HOUSING AVAILABILITY			
		1990	1997
Pittsburg	Dwelling Units	16,709	17,552
	Vacancy Rate	6.4%	6.4%
Antioch	Dwelling Units	22,973	28,083
	Vacancy Rate	6.8%	6.8%
Source: PDEF 1998; US Census Data;			

PUBLIC SERVICES

COMMUNITY PROTECTIVE SERVICES

The City of Pittsburg Police Department provides law enforcement service in the project area. The City of Pittsburg Police Department currently employs seventy-two sworn officers and maintains eighteen patrol cars, two vans, and seven unmarked vehicles. The department is located at 55 Civic Avenue in Pittsburg with satellite offices located throughout Pittsburg. The ratio of sworn personnel is 1:706 residents (White 1998). Average response time to the project site is about two minutes.

The City of Antioch Police Department is staffed by ninety-seven sworn personnel and thirty-eight non-sworn personnel. The department maintains thirty-six patrol vehicles, ten investigation vehicles, seven vehicles for managers, one communications vehicle, and one pick-up truck. The ration of sworn personnel is 1:789 residents (Privett 1998).

The Contra Costa Fire Department (30 fire stations) provides fire protection throughout the northern portion of Contra Costa County. Station 84 is closest to the project site and is located on 200 East 6th Street. Station 84 is staffed with six employees for each of the three shifts, and is equipped with one fire engine and one fire truck. Response time to the site is about three minutes (Ryan 1998). Fire Inspector Ryan also stated that Station #10 in Concord has hazmat response capabilities and would respond to a hazardous materials incident at the site in about fifteen minutes.

SCHOOLS

The Pittsburg and Antioch Unified School Districts provide educational services to students in the PDEF area. **SOCIOECONOMICS Table 7** provides a summary of the Pittsburg Unified School District. All schools in the Antioch School District are currently operating at capacity; three are closed to 1998-1999 enrollment (PDEF 1998). As shown in **SOCIOECONOMICS Table 7**, should the need arise, the

schools in the Pittsburg district have the capacity to absorb children of in-migrating construction workers.

SOCIOECONOMICS Table 7
SUMMARY OF SCHOOL DISTRICTS, 1998 ENROLLMENTS, AND CAPACITIES IN THE PITTSBURG SCHOOL DISTRICT

Pittsburg School District	Enrollment	Capacity
Foothill	608	784
Heights	570	744
Highland	716	824
Los Medanos	635	684
Martin Luther King Center	NA	NA
Parkside	675	764
Stoneman	717	1004
Willow Cove	643	829
Central Junior	1089	1,660
Hillview Junior	992	1,360
Pittsburg High School	1,825	2,358
Source: PDEF AFC 1998; Pittsburg School District		

Community Medical Services

There are eight hospitals in Contra Costa County with emergency rooms. Each hospital has one to two emergency room physicians available 24 hours a day. Of the eight hospitals in Contra Costa County, the Sutter-Delta Medical Center located on 3901 Lonetree Way in Antioch is the nearest hospital to the proposed site. This facility has a staff of 750, including 200 doctors, and 109 beds; it does not have a trauma center, does not conduct open-heart surgery, nor does it operate a critical-care nursery. The nearest trauma center in Contra Costa County is the John Muir Medical Center, located on 1601 Ygnacio Valley Boulevard in Walnut Creek. The response time for a trauma-related injury is about five minutes by air and about twenty minutes by ground transportation. This facility has about 256 beds (Gaub 1998).

Utilities

Utility services in the PDEF area are provided by Pacific Gas and Electric (PG&E).

IMPACTS

PROJECT SCHEDULE

The applicant expects project construction to begin in mid 1999 and end in early 2001 for a total of 21 months (PDEF 1998). **SOCIOECONOMICS Table 8** indicates the total number of worker-months of employment by month during project construction. The peak construction period is expected to last from approximately March 2000 through September 2000. There will be an average of 277 workers on-site during the peak construction period. The applicant states that the power plant will be staffed by about 20 full and part-time employees, consisting of engineers, equipment operators, maintenance, and security staff.

POWER PLANT IMPACTS

WORKFORCE AND EMPLOYMENT

If construction begins as expected in mid 1999, the peak construction period would begin approximately in March 2000 and continue through September 2000. **SOCIOECONOMICS TABLE 8** represents the total number of trades needed for construction, and **SOCIOECONOMICS TABLE 9** represents the availability of those trades in the PDEF project area and other Bay Area counties.

HOUSING

The applicant expects that most hiring of construction workers will occur within the three-county project area. The potential demand for housing is expected to be minimal. In-migrating or weekly-commuting construction workers could affect temporary housing stock such as motels or weekly rentals. However, any demand for additional housing as a result of project construction or operation can be accommodated by the existing vacancy rates in Pittsburg and Antioch. Additional temporary housing is available in motels and hotels in the Pittsburg/Antioch area.

PUBLIC SERVICES

Potential impacts to public services during construction could result from on-site construction activities. These impacts could result from construction-related demands for police, fire, medical, and other emergency services. In the AFC, the applicant states that an emergency response plan for the project will be prepared for the Contra Costa County Fire Protection District and the Contra Costa Health Services Department, thus, no new fire protection or emergency medical services will be required to serve the PDEF. Please refer to the **WORKER SAFETY** section of the FSA for any related impacts and associated mitigation in this area. Fire Inspector Ryan has stated that the project by itself does not impact the Contra Costa Fire Department's ability to provide fire protection and hazardous materials response within the county (Ryan 1998). In addition, the department will receive a one-time fire facilities fee, which will be assessed after project construction. This fee is part of the building permit fees collected by Pittsburg and is assessed at $0.15 per square foot for each building on the site.

SOCIOECONOMICS Table 8
Construction Requirements By Month

TRADE	1999								2000												
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Carpenters						10	16	16	16	16	16	18	18	12	8	3					149
Laborers	6	6	6	6	6	26	26	48	61	61	50	50	56	61	50	44	25	25	8	4	625
Ironworkers						16	26	32	34	38	34	18	14	14	5	3	3				237
Finishers						4	8	14	18	6	6	6	6	6	6	3					83
Operators	5	10	10	22	22	22	22	22	22	20	20	21	19	18	18	16	13	6	3	1	312
Pipefitters									15	32	32	48	61	65	53	53	33	29	24	18	463
Electricians			2	2	2		17	17	17	17	24	30	39	49	55	55	57	53	30	20	486
Millwrights											6	6	6	15	15	11	11	8	8	3	89
Boilermakers								20	25	25	25	25	25	9	7	6	6				173
Insulators															12	25	48	35	20	4	144
Painters									6	6	6	12	6	2	4	4	4	4	10	10	74
Teamsters	3	4	2	6		3	8	8	9	8	8	6	6	6	9	8	5	4	1	1	105
Others								25	17	11	22	16	6	12				25	21		155
Craft Total	14	20	20	36	30	81	123	202	240	240	249	256	262	269	242	231	205	189	125	61	3,095

Source: PDEF

SOCIOECONOMICS TABLE 9
Available Construction Workers by Craft

Trade	Project Peak Workforce Numbers	Total Workers 1994/1995	Total Workers 2001/2002	Contra Costa County		Alameda County		San Joaquin County		Solano County		Marin County	
				1995	2002	1995	2002	1995	2002	1995	2002	2002	2002
Carpenters	18	7840	8740	2110	2420	3360	3790	830	880	830	860	710	790
Laborers	61	3990	4750	1190	1460	1780	2140	240	270	410	450	370	430
Ironworkers	38	1930	1760	260	300	1280	1140	160	170	190	110	40	40
Finishers	18	1970	2310	530	650	660	790	260	280	420	470	100	120
Operators	22	1170	1100	470	550	180	200	90	100	210	220	30	30
Pipefitters	65	2850	3160	820	980	1180	1280	340	370	600	340	170	190
Electricians	57	5080	5300	1680	1910	2050	2220	440	450	630	420	280	300
Millwrights	15	530	480	200	150	150	180	130	120	50	50	N/C	N/C
Boilermaker	25	120	100	120	100	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C
Insulators	48	660	770	110	150	280	370	70	80	200	170	N/C	N/C
Painters	12	3110	3450	770	960	1380	1470	290	310	300	290	370	420
Teamsters	9	13130	13510	2590	2700	5720	5580	3010	3220	1210	1370	600	640

Source: US Greiner Woodward Clyde; Employment Development Department, Labor Market Division

Schools

The Pittsburg Unified School District assesses developer fees of $0.31 per square foot for commercial or industrial development (PDEF 1998). The applicant states in the AFC that the project will total an estimated 19,800 square feet. Therefore, the PDEF will be assessed a one-time developer fee of $6,138. Developer fees can be spent on both temporary and permanent construction and on offices, multipurpose rooms, bathrooms, and other facilities, and transportation as well as classrooms. There is no way to determine which schools within the Pittsburg Unified School District will receive these fees or how they will be spent. The Antioch Unified School District charges developer fees for commercial, industrial and residential constructions. The fee is $0.31 per square foot. No fees are charged for pipeleines of utilities, thus the proposed PDEF will not be required to pay developer fees to the Antioch Unified School District (PDEF 1998).

Construction and operation of energy projects can cause impacts to local school districts, which are at or over capacity by adding to the enrollment of those districts. To adequately address increases in enrollment, those districts must incur additional costs for additional teachers and classrooms. The applicant expects to hire construction workers from within the three-county project area, and therefore does not expect construction workers and their families to re-locate to Pittsburg or Antioch for the duration of the construction period. In addition, Senate Bill 50, signed by Governor Wilson on August 27, 1998, amended section 17620 of the Education code, and school funding is restricted to property taxes and statutory facility fees collected at the time the building permit is acquired. Public agencies may not impose fees, charges or other financial requirements to offset the cost for “school facilities”. School facilities are defined as “any school-related consideration relating to a school district’s ability to accommodate enrollment.“

Impact on Fiscal Resources and the Local Economy

The applicant estimates the capitol cost of the project to be between $200 and $300 million dollars, therefore, if assessed by the county, the project is expected to generate between $2 and $3 million a year in property taxes (PDEF 1998). Because the project is located in a redevelopment area, property tax revenues normally would be distributed to the Pittsburg Redevelopment Agency (Abelson 1998).

State Board of Equalization’s Issue Paper

The State Board of Equalization’s November 13, 1998 issue paper states that assessment of power generating facilities of 50 megawatts or more should be conducted by the state, using unitary valuation and allocation of revenues on a countywide basis. Board of Equalization staff recommends that implementation of state assessed facilities should be carried out in two phases. Phase 1, which was adopted by the Board on 12/7/98 and commences on 1/1/99, would assess those companies that have purchased electric generation facilities previously owned by regulated public utilities. Phase 2, which would include all companies producing 50 megawatts or more, is proposed to be adopted on 1/1/2000. Thus, when Phase 2 is implemented, the PDEF will most likely be assessed on the unitary tax roll, with revenues from property taxes allocated by formula on a countywide basis with each

jurisdiction in the county (cities, school districts, and special districts) receiving a portion of the revenues. A primary difference between state assessment and county assessment is that under county assessment the valuation provisions of Article XIIIA (Proposition 13) apply, including establishing a base year value, a limit of two percent on annual increases, and valuation on the lower of fair market value or adjusted base year value. These provisions do not apply to state assessed property, which is valued annually at fair market value (BOE 1998). Therefore, Pittsburg should expect substantial changes in the allocation of property tax revenues generated by the project and a diminishment of revenues to the city.

State Enterprise Zones

The PDEF is proposed to be located adjacent to a State Enterprise Zone. Enterprise zones have been established in California to stimulate development in selected economically depressed areas. The State Enterprise Zone Act provides five business-related tax incentives:

- credit for sales and use tax paid on certain machinery;
- credit for hiring certain qualified employees;
- business expense deduction for the cost of certain property;
- net operating loss carryover; and
- net interest deduction for lenders.

Energy Commission staff's conversation with Mr. Gerald Dunbar, Director of Economic Development for the City of Pittsburg indicated that it is typical for businesses and industries located adjacent to enterprise zones to petition the city to reconfigure the enterprise zone boundary to include their parcel (Dunbar 1998). Any request to reconfigure the geographic boundary of an enterprise zone would require City Council review and approval. Mr. Dunbar stated that it would not be unusual for the applicant to petition the city for such a request. At this time, Energy Commission staff is not aware that the applicant has petitioned the City of Pittsburg to reconfigure the enterprise zone boundary to include their parcel. If the applicant does petition the city and receives approval from the City Council to reconfigure the enterprise zone boundaries, the applicant would be eligible for the above benefits.

Local Purchasing of Equipment and Supplies

The PDEF's annual operation payroll is expected to be about $1.4 million. The estimated total construction payroll is about $26.4 million. The applicant expects local purchasing of equipment and supplies and local spending by construction workers and permanent employee households will generate income for Contra Costa County and the cities within the study area in the form of sales tax revenues. The applicant estimates that $170 million of materials and subcontracts will be purchased during operations, some of these purchases would occur in the study area communities and would generate sales tax revenues for Contra Costa County and the cities within the study area (PDEF 1998).

ALLIANCE AND DEVELOPMENT AGREEMENT

On June 6, 1997, Enron Capital & Trade Resources Corporation (ECT) and Pittsburg Power Company Joint Powers Agency (Pittsburg) entered into an Alliance and Development Agreement. As part of this agreement, any project profits will be distributed on a forty-percent basis to ECT and 60-percent basis to Pittsburg. The applicant requested that the agreement be analyzed in the **SOCIOECONOMIC RESOURCES** section of the FSA. Energy Commission staff is including a copy of the agreement as **Appendix A**. Energy Commission staff has no information from the applicant or Pittsburg regarding expected net profits associated with the PDEF.

IMPACT ON LOCAL PROPERTY VALUES

The project is unlikely to have an impact on surrounding residential property values. The twelve-acre site is located on the northwest portion of the USS-POSCO Industries property; the project's twenty-acre construction and laydown area is adjacent to the actual site. The site is currently designated General Industrial on the City of Pittsburg General Plan land use map, and is zoned IG (General Industry). The PDEF site is located within a large industrial complex; other industrial facilities near the site include the PMT Petroleum Coke Handling Facility, the GWF Power Plant, the USS-POSCO Industries steel mill, Dow Chemical, and Johns Manville. Please refer to the section on **LAND USE** for a discussion of surrounding land uses.

CUMULATIVE IMPACTS

PDEF may cause cumulative impacts to the Delta Diablo Water Treatment facility. Please refer to the **WATER RESOURCES** section of the FSA for a discussion of cumulative impacts in this area. Because of information provided in the AFCs for PDEF and the proposed Delta Energy Center, and Energy Commission staff's independent analysis of potential socioeconomic impacts, staff does not expect any cumulative impacts to schools, housing, or public services due to these projects.

FACILITY CLOSURE

Energy Commission Staff does not know of any Socioeconomic LORS related to facility closure. Facility closure would have to be in accordance with an Energy Commission-approved closure plan.

MITIGATION

Because the applicant has proposed economic and fiscal benefits to the project area through sales tax and direct purchases of construction materials and services from local vendors (PDEF 1998), Energy Commission staff is incorporating a contingency measure into the proposed conditions of certification.

CONCLUSION AND RECOMMENDATION

CONCLUSION

The applicant has proposed economic and fiscal benefits to the project area. To ensure that some economic benefit occurs in the project area, Energy Commission staff has proposed a condition of certification that requires the project owner and its contractors and subcontractors to recruit employees and procure materials and supplies locally.

RECOMMENDATION

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

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within Contra Costa County first, and Alameda and Solano Counties second unless:

- to do so will violate federal and/or state statutes;
- the materials and/or supplies are not available; or
- qualified employees for specific jobs or positions are not available; or
- there is a reasonable basis to hire someone for a specific position from outside the local area.

Verification: At least 60 days prior to the start of construction, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the Energy Commission CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months. The Energy Commission CPM shall review and comment on the submittal as needed.

SOCIO-2 The project owner shall pay the statutory development fee as required at the time of filing for the “in-lieu” building permit with the City of Pittsburg Building Department.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

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BIOLOGICAL RESOURCES

Testimony of Marc Sazaki

INTRODUCTION

The 500 MW Pittsburg District Energy Facility (PDEF) is proposed to be constructed on 12 acres of a previously disturbed vacant portion of USS-POSCO Industries' land south of New York Slough in the city of Pittsburg. An additional 20 acres just south of the power plant site will be used as a construction laydown area. The power plant will front on East 3rd Street. Two transmission lines, one about one mile long that will interconnect to the existing USS-POSCO electrical substation strung on 130 foot high steel lattice or tubular poles and another strung on 150' foot steel lattice or tubular poles line about two miles long that will interconnect with a PG&E tap line will be constructed. Two 150 foot tall exhaust stacks will be associated with the heat recovery steam generators. A 40 foot tall six-cell bank of wet cooling towers will be installed. Additionally, reclaimed water supply and discharge pipelines of about two and a half miles long will be installed for connection to the Delta Diablo Wastewater Treatment Facility (DDWTF) to serve the cooling water system needs of the power plant. The returned wastewater will eventually be returned to the DDWTF and discharged to New York Slough under DDWTF's existing NPDES permit.

All of these project features can be important intrusive elements in the wildlife environment at the site and surrounding area depending upon the nature and quality of existing wildlife habitat conditions.

Biological resource surveys conducted by consultants for the applicant provide information useful in determining the potential impacts related to the power plant and its ancillary facilities. (PDEF 1998a.) The applicant has proposed measures to minimize potential impacts on biological resources. Though generic in nature, these proposed actions to minimize impacts are appropriate for the project being proposed in light of the setting in which it will be constructed and operated. This staff analysis: 1) describes the biological character of the site; 2) evaluates the potential for project related impacts, both based on the results of biological resources baseline inventories described in the application for certification (AFC) and site visits undertaken by staff; and 3) examines, supports, modifies, or recommends additional mitigation measures identified by the project owner.

If the proposed Conditions of Certification for biological resources are required and subsequently implemented, staff concludes that there will be no significant biological resources impacts associated with the construction and operation of the proposed Pittsburg District Energy Facility.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

- The Endangered Species Act of 1973 (16 U.S.C., §§1531 et seq.), and implementing regulations, (50 C.F.R. §§17.1 et seq.), designate and provide for protection of threatened and endangered plants and animals and their critical habitat.

- Migratory Bird Treaty Act (16 U.S.C. §§701-718) and implementing regulations (50 C.F.R.) Subchapter B provides protection for migratory birds.

STATE

- California Native Species Conservation and Enhancement Act, (Fish & G. Code, §1755 et seq.), mandates as state policy, maintenance of sufficient populations of all species of wildlife and native plants and the habitat necessary to insure their continued existence at optimum levels.

- California Endangered Species Act, (Fish & G. Code, §2050 et seq.), protects California's endangered and threatened species. The implementing regulations, (Cal. Code Regs., tit.14, §670), lists animals of California declared to be threatened or endangered.

- Native Plant Protection Act (Fish & G. Code, §1900 et seq.), establishes criteria for determining if a species, subspecies, or variety of native plant is endangered or rare and regulates the taking, possession, propagation, transportation, exportation, importation, or sale of endangered or rare native plants.

- Fish and Game Code, section1603 requires that any person planning to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake designated by the department, or use any material from the streambeds, must notify the department prior to such activity so that the Department can carry out its mandate by proposing measures necessary to protect the fish and wildlife.

- Fish and Game Code sections 3511, 4700, 5050, 5515 prohibit the taking of birds, mammals, reptiles and amphibians, and fishes respectively listed as fully protected in California.

- Fish and Game Code, section 1900 et seq., gives CDFG authority to designate state endangered and rare plants and provides specific protection measures for identified populations.

- Fish and Game Code, section 3513 makes it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act except as provided for under federal rules and regulations.

SETTING

The focus of this analysis is directed toward impacts on threatened or endangered species, fully protected species, species of special concern, recreational species, and areas of critical concern.

Threatened or endangered species are those formally recognized and listed by the state or federal government. Fully protected species receive special legal protection from the state in the form of prohibition against unpermitted take or possession, while species of special concern are candidate threatened or endangered species or unique species that are protected through state and local permitting processes by requiring mitigation to minimize potential adverse effects resulting from project development. This particular category also includes, but is not limited to, those rare and endangered plant species recognized by the California Native Plant Society. Though endangered plant species recognized by the California Native Plant Society may not be formally listed by state or federal governments, they may be considered endangered under the California Environmental Quality Act (CEQA) (Cal. Code Regs., tit. 14, ∋15380 (d)). Recreational species are generally ones that are harvested by the public for sport or utilized for nonconsumptive purposes.

Areas of critical concern are special or unique habitats or biological communities. This category includes, but is not limited to, wildlife refuges and wetlands. Both species of special concern and areas of critical concern may be identified by the California Natural Diversity Data Base (CNDDB) and other state, federal, and local agencies with responsibility within the project area or by educational institutions, museums, biological societies and special interest groups that might have specific knowledge of resources within the project area.

REGIONAL DESCRIPTION

Existing wetlands and undeveloped upland areas in the bay-delta region support many amphibians, reptiles, passerines, raptors, shore birds, waterfowl, and small to medium sized mammals. Plant and animal species listed under state and/or federal Endangered Species Acts inhabit the region. They include, among others, the Antioch Dunes evening-primrose (*Oenothera deltoides* ssp. *howellii*), palmate bird's-beak (*Cordylanthus palmatus*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), salt marsh harvest mouse (*Reithrodontomys raviventris*), California clapper rail (*Rallus longirostris obsoletus*), California least tern (*Sterna antillarum browni*), and black rail (*Laterallus jamaicensis coturniculus*).

Additionally, listed aquatic species that inhabit the Sacramento-San Joaquin River Delta include winter-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley evolutionarily significant unit (ESU) steelhead (*Oncorhynchus mykiss*), Delta smelt (*Hypomesus transpacificus*), and Sacramento splittail (*Pogonichthys macrolepidotus*). Other species proposed for listing or of special concern to responsible resource management agencies include Chinook salmon-Central Valley fall/late fall-run ESU (*Oncorhynchus tshawytscha*), spring-run chinook salmon

(*Oncorhynchus tshawytscha*), green sturgeon (*Acipenser mediostris*), and longfin smelt (*Spirinchus thaleichthys*). (Jones & Stokes 1998.)

The bay-delta complex continues to be an important segment of the Pacific Flyway. There are recreation areas, both publicly and privately managed, that provide opportunities for waterfowl hunting enthusiasts as well as nonconsumptive users.

Sport and commercial fisheries are ongoing enterprises within the bay-delta ecosystem. The status of these regulated fisheries varies from year to year reflecting changes in environmental conditions and ongoing management of water resources in upstream drainages and within the delta complex.

SITE AND VICINITY DESCRIPTION

Site-specific biological resources field surveys were conducted at the project site and laydown area by the applicant's biologists on April 26, 1998, and May 6, 1998. Energy Commission staff attended a site visit with the applicant's biologist on September 4, 1998. During a subsequent site visit on December 15, 1998, Energy Commission staff conferred with the applicant's botanist regarding new alternative linear facilities described in the applicant's December 7, 1998, supplement to the AFC.

Presently, the land at the proposed power plant site, as well as the laydown area, offers little in the way of high quality habitat for wildlife, although some species do manage to survive in spite of existing conditions. The vegetation is ruderal in nature consisting of weedy herbaceous species and very few shrubs. During spring surveys, a racer (*Coluber constrictor*), western fence lizards (*Sceloporus occidentalis*), and black-tailed jackrabbits (*Lepus californicus*) were observed there. (PDEF 1998a, AFC Page 5.6-4.) A black-crowned night heron (*Nycticorax nycticorax*) was observed in a small wetland area north of the retention basin which lies to the immediate west of the proposed laydown area. This species, observed on an informal July 30, 1998, Energy Commission staff visit to the project vicinity, was not included in Table 5.6-2. (PDEF 1998a, AFC Page 5.6-20.) Other common species that are likely to inhabit the power plant site and laydown area include the house sparrow (*Passer domesticus*), rock dove (*Columba livia*), house mouse (*Mus musculus*) and Norway rat (*Rattus norwegicus*). During Energy Commission staff's second site visit, a pair of northern harriers (*Circus cyaneus*), an American Crow (*Corvus brachyrhynchos*), a northern flicker (*Colaptes auratus*) were observed over the laydown area and near the retention basin immediately to the west. Table 5.6-2 in the applicant's December 7, 1998, supplement to the AFC (PDEF 1998c, AFC Page 5.6-8.) does not include these species, but does include mourning dove (*Zenaida macroura*), red-winged blackbird (*Agelaius phoeniceus*), and white-crowned sparrow (*Zonotrichia leucophyrs*), which were also observed by Energy Commission staff during the second site visit.

The site and construction laydown area will be on land that has been used for industrial purposes since before 1911. (W-C 1998b.) Furthermore, the site is surrounded by industrial development, commercial structures, and related ancillary

facilities. Residential properties lie to the south of USS-POSCO Industries property, just beyond an east-west running rail switching yard.

There is a storm water retention basin adjacent to the proposed laydown area on the west side of USS-POSCO Industries' vacant property where it abuts a rail spur running along a portion of the eastern edge of Harbor Street. (Woodward-Clyde 1998; PDEF 1998u, Data Response Bio-1.) This retention basin experiences seasonal inundation of runoff from the surrounding area. There is also periodic standing water outside the retention basin where an old double rail spur gets inundated between the retention basin berm and Harbor Street. Small trees on the margin of this periodically flooded area provide cover for song birds in addition to shorebirds that utilize the wetted area. The presence or absence of fairy shrimp in this particular area has not been verified. Except for the transmission line routes designated as alternatives 10 and 10a which will span the eastern end of the wetland area, no project related disturbance will take place here during construction or operation. (PDEF 1998u, Data Response Page 29.)

The proposed project will be situated on the south bank of the New York Slough opposite Browns Island. New York Slough is a relatively small waterway connecting the San Joaquin River to the Sacramento River downstream of their main confluence. This slough is about 800 feet wide in the vicinity of the proposed power plant as compared to about 3,900 feet wide were the slough branches off from the San Joaquin River.

Browns Island Regional Shoreline is a component of the East Bay Regional Park District where high quality wildlife habitat for shorebirds, waterfowl, other animals and plants is protected by the district to the extent possible on a 695 acre delta island. Sensitive plant species occurrence on Browns Island include Delta tule pea (*Lathyrus jepsonii jepsonii*), Suisun marsh aster (*Aster lentus*), Mason's lilaeopsis (*Lilaeopsis masonii*), Antioch dunes evening-primrose (*Oenothera deltoides howellii*), and Delta mudwort (*Limosella subulata*). (PDEF 1998a, AFC Page 5.6-7&8.) Recreational opportunities are available in the form of wildlife observation and fishing from canoes or kayaks. In addition, canoeing and kayaking as a recreational pastime can be enjoyed in a network of water ways only suitable for this form of watercraft. Jet skis can also make use of these waterways. On a centrally located 100 acre inholding owned by the Stockton Port District, hunting is allowed. (Fiala 1998.)

The linear facilities associated with the project include water supply and discharge lines, a natural gas supply line, and transmission lines. These linear facilities will parallel existing roads and highways for the most part, except for the natural gas pipeline and transmission line which, in one segment, pass through some riparian habitat and near small wetland areas. (PDEF 1998a, AFC Page 5.6-4 and Figure 5.6-1.) Species tolerant of the urban surroundings here are likely to inhabit such open spaces. A number of them are identified in the PDEF AFC and include red-tailed hawks (*Buteo jamaicensis*) and great blue herons (*Ardea herodias*). (PDEF 1998a, AFC Page 5.6-4.)

IMPACTS

PROJECT SPECIFIC IMPACTS

The site and laydown areas are highly disturbed. Resident wildlife are common species, none of which are listed or sensitive. Consequently, impacts on biological resources are not likely to be significant.

Soil erosion related to construction activities can impact aquatic biological resources if allowed to enter local water ways, but potential erosion can be mitigated by applying appropriate site specific measures. An draft erosion control plan has been submitted to the Energy Commission for review and approval. Through implementation of an approved erosion control plan, as required in the Soils & Water Resources conditions of certification for this project, it is anticipated that aquatic biological resources will not be significantly impacted.

The potential for bird collisions with project turbine stacks, the boiler stack, or cooling towers is identified as significant in the AFC. (PDEF 1998a, AFC Page 5.6-14.) While this may be a concern, documented bird mortalities appear to be associated with relatively tall stacks ranging from 500 to 650 feet high. (Goodwin 1975.)(Maehr et al. 1983.)(Weir 1974.)(Zimmerman 1975.) Though the potential for this impact exists with shorter stacks, it is not well documented in the scientific literature. Monitoring should be done for a period of time after construction to determine if this is a significant problem associated with the project.

Bird collisions with local electric distribution lines is expected to be very unlikely because of the relative low height of the poles and their close proximity to buildings and other structures. There may be a greater potential for birds colliding with 115kV lines because they will be on poles or towers 130 to 150 feet tall, but this is still considered to be somewhat low, except for a newly proposed alternative transmission line segment designated as 10A and described in the AFC supplement. (PDEF 1998c, AFC Page 5.6-2.) This transmission line route will traverse a brackish marsh as it approaches the Pittsburg Power Plant substation. At least six similar transmission lines already parallel this proposed segment and may pose a significant bird strike hazard, although Energy Commission staff is unaware of any existing documentation of this problem. An additional transmission line will undoubtedly exacerbate such a problem, if it exists. Construction of transmission line alternative 10A will most certainly eliminate and/or degrade wetland habitat. The applicant has not gained access to this segment to conduct biological surveys or a wetland delineation. (Wilson 1998, personal communication.)

With respect to bird electrocution, Energy Commission staff agrees with the view expressed in the AFC that raptors and other birds likely to be in the area and possibly use transmission towers for perching have wing spans smaller than the distance between conductors. (PDEF 1998a, AFC Page 5.6-14.) If a problem of this nature is detected after the lines are energized and further monitoring indicates chronic mortalities persist, Energy Commission staff will coordinate with appropriate

biological resource agencies to determine if protective measures can be retrofitted to the towers.

Where transmission lines and the natural gas supply pipeline traverse habitat with riparian vegetation and/or wetland areas transmission tower placement and gas line installation will be done so as to avoid these important habitats, thus avoiding direct impacts to the extent possible. (PDEF 1998a, AFC Page 5.6-14.) Where avoidance is impossible, the applicant will confer with the appropriate resource agencies to develop adequate mitigation to protect important habitats. Mitigation measures required pursuant to Fish and Game Code section 1603 (Streambed Alteration Agreement) are expected to be adequate for minimizing potential impacts to this riparian habitat during construction. The applicant must file an application for the streambed alteration agreement and implement the terms of the agreement in order to minimize potential impacts to a level of insignificance. The proposed reclaimed water line route and proposed natural gas pipeline route both will cross a channelized portion of Kirker Creek. The water line will be suspended across the creek, while the gas line will be installed below the creek bed utilizing boring equipment. (PDEF 1998c, AFC Page 5.6-2.) The potential for animals falling into trenches excavated for the gas pipeline and water line can be minimized by covering open trenches during extended periods of work stoppage. Therefore, this is not considered by Energy Commission staff to be a significant problem.

Cooling tower blow-down will be delivered via pipeline to the DDWTF, commingled with other wastewater prior to treatment, treated, and subsequently discharged to New York Slough under the existing NPDES permit. (PDEF 1998k, Data Response 4a.) Because approximately 65.4 per cent of the water received from the treatment facility for project use will be lost to evaporation, a reduction in the total discharge from DDWTF to New York Slough will occur. This will result in an overall reduction in the volume of the waste-stream discharged to the slough, although the concentration of constituents in the discharge will likely increase. With compliance of the discharge limitations established in the NPDES permit, impacts on aquatic species in the slough are expected to be insignificant because discharge limits are established based on the levels necessary to protect aquatic organisms and the discharge outlet is located at the bottom of mid-channel allowing for good mixing and dilution. Impacts on fish and other aquatic species in New York Slough are not expected to be significant. See the **Water Resources** Section for a discussion of the applicable NPDES permitting process and water quality assessment for this project.

Stack emissions from the proposed project will be greatest on the north side of New York Slough and in the Browns Island vicinity. (Heredia 1998.) The potential effects on vegetation, particularly the listed species described above, is not likely to be significant based on the analysis of NO_2 and SO_2 deposition modeling presented in the applicant's -Authority to Construct Application for the Pittsburg District Energy Facility which was filed with the Bay Area Air Quality Management District. (PDEF 1998a, AFC Appendix J Page 5-16 thru 5-18.)

CUMULATIVE IMPACTS

Cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

Considering the existing level of industrial and residential development in close proximity to the site including the Pittsburg Marine Terminal Project (PMT), which is north and adjacent to the proposed project and partially constructed, Energy Commission staff does not regard the potential incremental impacts of the proposed project as significant. Similarly, CalPine's proposed Delta Energy Center, an 880 MW power plant approximately 1.5 miles to the east, will not likely contribute significant emissions to the area near Enron's proposed power plant in Pittsburg because of prevailing wind patterns. See the cumulative impact analysis in the **Air Quality** section for pertinent information regarding this issue. One of the more important wildlife areas close to the site of the power plant is Browns Island. Impacts of power plant emissions are expected to be greatest on the north side of New York Slough and in the vicinity of Browns Island. Whether these impacts, combined with other sources of industrial emissions in the Pittsburg area are significant is uncertain. Energy Commission staff is unaware of any monitoring data that would indicate an air quality problem exists, or could in the future. Another important area from a biological resource perspective is the wetlands surrounding Pacific Gas and Electric's Pittsburg Power Plant. If transmission alternative route 10A is developed, the addition of another high voltage transmission line in the corridor leading to the Pittsburg Power Plant substation could become significant because it will further degrade the quality of the wetland habitat there and may increase the potential for bird injury and mortality associated with collisions between birds and electric transmission lines. The applicant has not surveyed alternative 10A at this time, so the potential for significant cumulative impacts related to this alternative is unpredictable. For other aspects of the proposed project, Energy Commission staff concludes that any biological resource impacts associated with past, recent, and reasonably foreseeable development of the City of Pittsburg are not expected to be made significantly worse by the construction and operation of the Pittsburg District Energy Facility.

FACILITY CLOSURE

Except for revegetation or alternative stabilization measures of any area where structures are removed so that surface soil erosion can be minimized, there is no anticipated need for other measures to address biological resource needs. If the facility is closed after a 30 plus year operational period, the surrounding community may be more highly industrialized and densely populated. In this case, restoration to natural habitat would probably not be practical, in part because the project is not on waterfront property.

MITIGATION

The applicant proposes to mitigate potential impacts identified in their AFC by implementing various mitigation measures (PDEF 1998a, AFC Page 5.6-15a thru 5.6-17.) (PDEF 1998c, AFC Supplement Page 5.6-5.)

The applicant's mitigation measures include:

11. Transmission line towers will be placed to span wetland resources. New 115 kV transmission lines will be designed as per the publication titled to reduce the risk of electrocution for large migratory birds.

12. Construction area boundaries will be clearly delineated by stakes, flagging, and/or rope to minimize inadvertent degradation or loss of wetland habitat during construction activities associated with pipelines and transmission lines.

13. Soil erosion will be reduced during construction and operation by applying measures identified in the proposed Water Resources Mitigation Measures Section in the AFC (PDEF 1998a, AFC Page 5.5-11.) and complying with State Water Resources control Board/Regional Water Quality Control Board standards.

14. Mitigation to reduce impacts from potential bird collisions with boiler stacks, cooling towers, turbine stacks and other structures will be accomplished by reducing exterior lighting on all structures to the minimum except for those required for aviation warning. All other required exterior lighting on structures will be shielded to direct light downward.

15. A wetland area at Mile Post 0.8 of Route 1 will be spanned by locating towers at least 100 feet from the existing edges of the wetland. No construction activities or access will be allowed within the designated wetland or buffer area.

16. A worker biological education program focussing on protection of sensitive resources, such as the wetland areas the near Route 1 transmission line, will be conducted for all project workers.

17. A designated mitigation monitor will ensure that the sensitive wetland areas are properly staked or flagged to avoid direct project impacts during construction activities. During construction activities, a qualified wetlands biologist will monitor all project construction activities that could adversely impact the wetland areas and implement corrective measures where appropriate.

18. Construction area boundaries will be clearly delineated by stakes, flagging , and/or rope to minimize inadvertent degradation or loss of wetland habitat associated with the construction of linear facilities along Routes 4, 4, 6, 10, and 10A, and that construction activities and access be limited to upland areas where Routes 5 and 6 span Kirker Creek.

19. Impacts to wetlands associated with construction of Route 10A will be lessened by sedimentation control measures such as the placement of silt fencing and replanting of vegetation after construction of the transmission line.

20. The worker biological education program will now focus on protection of sensitive resources such as the brackish marsh along Route 10A in lieu of focusing on wetland areas along Routes 1 and 5.

Energy Commission staff proposes to incorporate, in part, the applicants mitigation measures above into those described below, in order to minimize potential project related impacts.

Measures to mitigate runoff of eroded soils from all construction sites where soil disturbance will occur are addressed by Energy Commission staff in the **Soil Resources** and **Water Resources** sections of the FSA respectively. The conditions of certification developed in these two technical disciplines will adequately protect biological resources from the potential impacts related to site erosion and water quality.

Specific Mitigation Measures

1. To insure the likelihood of successful completion of required mitigation, the project owner should designate a qualified biologist to advise the project owner or its project manager on the implementation of these Conditions of Certification, and to supervise or conduct mitigation, monitoring, and other biology compliance efforts.

2. To promote project personnel's general understanding of environmental concerns associated with the project and enhance the likelihood of their compliance with conditions of certification, the owner should institute an employee environmental awareness program in which each of its own employees, as well as employees of contractors and subcontractors who work on the project site during construction and operation are informed about biological resource sensitivities associated with the project.

3. In order to prevent animals from becoming trapped in any trenches excavated while installing natural gas pipelines or underground transmission lines, the project owner should have any open portions of the trench covered when left unattended.

4. The project owner should develop a plan to monitor bird mortality due to collision with the stacks on the project site as well as the transmission lines that will connect to the Pittsburg Power Plant substation. Mortalities associated with transmission lines should be identified as to whether the cause is electrocution or collision with towers or conductors.

COMPLIANCE WITH LORS

Except for transmission line alternative route 10a which will impact wetlands and require a federal permit pursuant to section 404 of the Clean Water Act, no project related impacts on listed species or on wetlands will occur which would require compliance with state or federal regulations governing these matters of concern.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

This analysis has identified potentially significant impacts related to surface disturbance of wetland areas and bird collisions with project features. These potential impacts are associated with project related construction and operation, but with the implementation of the proposed mitigation and any terms and conditions included in a section 404 permit, are not expected to be significant.

RECOMMENDATIONS

From a biological resources perspective, the project should be approved with the staff proposed conditions of certification. These conditions of certification encompass those recommended by the project applicant.

CONDITIONS OF CERTIFICATION

Implementation of the mitigation measures described herein, and as proposed in the following conditions of certification, will reduce the potential for significant biological impacts of the proposed project.

BIO-1 Construction-site and/or ancillary facilities preparation (described as any ground disturbing activity other than allowed geotechnical work) shall not begin until an Energy Commission Compliance Project Manager (CPM) approved designated biologist is available to be on site.

The designated biologist must meet the following minimum qualifications:

1) a bachelor'S degree in biological sciences, zoology, botany, ecology, or a closely related field,

2) three years of experience in field biology or current certification of a nationally recognized biological society, such as the Ecological Society of America or The Wildlife Society,

3) one year of field experience with resources found in or near the project area, and

4) ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resource tasks that must be addressed during project construction and operation.

If the CPM determines the proposed designated biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration.

If the approved designated biologist needs to be replaced, the project owner shall obtain approval of a new designated biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement.

No disturbance will be allowed in any designated sensitive area(s) until the CPM approves a new designated biologist and that designated biologist is on-site.

Verification: At least 30 days prior to the start of surface disturbing activities at the project site and/or at ancillary facilities, the project owner shall submit to the CPM for approval, the name, qualifications, address, and telephone number of the individual selected by the project owner as the designated biologist. If a designated biologist is replaced, the information on the proposed replacement as specified in the condition must be submitted in writing to the CPM.

If the project owner is not in compliance with any aspect of this condition, the CPM will notify the project owner of making this determination within 14 days of becoming aware of the existence of any noncompliance. Until the project owner corrects any identified problem, construction activities will be halted in areas specifically identified by the CPM or designee as appropriate to assure the potential for significant biological impacts is avoided.

For any necessary corrective action taken by the project owner, a determination of success or failure of such action will be made by the CPM after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIO-2 The CPM approved designated biologist shall perform the following duties:

1) advise the project owner's supervising construction or operations engineer on the implementation of the biological resource conditions of certification,

2) supervise or conduct mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species, and

3) notify the project owner and the CPM of any non-compliance with any condition.

Verification: The designated biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM.

BIO-3 The project owner's supervising construction and operating engineer shall act on the advice of the designated biologist to ensure conformance with the biological resource conditions of certification.

The project owner's supervising construction and operating engineer shall halt, if needed, all construction activities in areas specifically identified by the designated biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The designated biologist shall:

1) tell the project owner and the supervising construction and operating engineer when to resume construction, and

2) advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two working days of a designated biologist notification of non-compliance with a Biological Resources condition or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition.

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

BIO-4 The project owner shall develop and implement a Worker Environmental Awareness Program in which each of its own employees, as well as employees of contractors and subcontractors who work on the project site or related facilities (including any access roads, storage areas, transmission lines, water and gas lines) during construction and operation, are informed about biological resource sensitivities associated with the project.

The Worker Environmental Awareness Program:

a) shall be developed by the designated biologist and consist of an on-site or classroom presentation in which supporting written material is made available to all participants;

b) must discuss the locations and types of sensitive biological resources on the project site and adjacent areas;

c) must present the reasons for protecting these resources;

d) must present the meaning of various temporary and permanent habitat protection measures;

e) must identify who to contact if there are further comments and questions about the material discussed in the program; and,

f) shall inform workers of the potential biological resource impact risk associated with all construction and operational activities as is appropriate and emphasize protection of sensitive resources such as the brackish marsh along Route 10A as well as the wetland areas along Routes 1 and 5.

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

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program material. Each statement shall also be signed by the person administering the Worker Environmental Awareness Program.

The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six (6) months after the start of commercial operation. Signed statements for active operational personnel shall be kept on file by the project owner for the duration of their employment and for six months after their termination.

Verification: At least 30 days prior to the start of surface disturbing activities at the project site and/or at ancillary facilities, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the designated biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

BIO-5 The project owner shall submit to the CPM for review and approval a copy of the Biological Resources Mitigation Implementation and Monitoring Plan for this project.

The Biological Resources Mitigation Implementation and Monitoring Plan shall:

- identify all sensitive biological resources to be impacted and avoided by project construction and operation;

- identify all mitigation, monitoring and compliance conditions included in the Commission'S Final Decision;

- identify all conditions agreed to in any CDFG Streambed Alteration Agreement;

- indicate the placement of transmission line towers so that wetland resources will be avoided, or if not avoided, constructed in such a way that impacts will be minimized to the extent practicable.

- design new 115 kV transmission lines to reduce the risk of electrocution for large migratory birds;

- clearly delineate construction area boundaries with stakes, flagging, and/or rope to minimize inadvertent degradation or loss of wetland habitat during construction activities associated with pipelines and transmission lines, with special attention given to wetland habitat associated with the construction of linear facilities along Routes 4, 5, 6, 10, and 10A, and limit construction activities and access to upland areas where Routes 5 and 6 span Kirker Creek. Show all locations requiring temporary protection/signs during construction on a map of suitable scale;

- indicate duration for each type of monitoring established for mitigation actions and include a description of the monitoring methodologies and frequency;

- describe performance standards to be used to help decide if/when proposed mitigation is or is not successful; and
- identify all remedial measures to be implemented if performance standards are not met.

- reduce potential bird collisions with boiler stacks, cooling towers, turbine stacks and other structures by reducing exterior lighting on all structures to the minimum except for those required for aviation warning, while all other required exterior lighting on structures will be shielded to direct light downward;

- reduce soil erosion during construction and operation by applying measures identified in the proposed Water Resources conditions of certification of the Energy Commission Decision for the project and comply with State Water Resources Control Board/Regional Water Quality Control Board standards;

- span the identified wetland area at Mile Post 0.8 of Route 1 by locating towers at least 100 feet from the existing edges of the wetland, and not allow construction activities or access within the designated wetland or buffer area;

- provide for having a mitigation monitor who will ensure that the sensitive wetland areas are properly staked or flagged to avoid direct project impacts during construction activities, and have a qualified wetlands biologist monitor all project construction activities that could adversely impact the wetland areas and have corrective measures implemented where appropriate;

- lessen impacts to wetlands associated with construction of Route 10A by completing sedimentation control measures such as the placement of silt fencing and replanting of vegetation after construction of the transmission line; and,

- reduce the potential for animals fall into trenches or other excavated sites during times when these trenches or sites are left unattended by covering them or providing escape ramps at intervals that will maximize their availability and potential use.

Verification: At least 60 days prior to the start of surface disturbing activities at the project site and/or at ancillary facilities, the project owner shall provide the CPM with the final version of the Biological Resources Mitigation Implementation and Monitoring Plan for this project, and the CPM will determine the plans acceptability within 15 days of receipt of the final plan. After the plan is approved, the project owner shall notify the CPM five working days before implementing any agreed to modifications to the Biological Resource Mitigation Implementation and Monitoring Plan.

Within 30 days after completion of construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Biological Resource Mitigation Implementation and Monitoring Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which condition items are still outstanding.

BIO-6 Site disturbance and project construction shall not commence until the project owner has developed a protocol for inclusion in a Biological Resources Mitigation Implementation and Monitoring Plan to monitor for bird mortality due to collision with the stacks on the project site as well as the transmission lines. Mortalities associated with transmission lines shall, to the extent possible, be identified as to whether the cause is electrocution or collision with towers or conductors. The protocol shall include a thorough description of methods for collecting and recording this data.

As part of this protocol, a report describing the results after each year of monitoring shall be submitted to the CPM on the next closest annual report date established for the project in this decision. If the CPM determines that the report content or format requires changes, the project owner shall modify the report based on the CPM's comments.

If bird mortalities are documented as a result of the monitoring, the project owner shall recommend and, if deemed necessary and acceptable by the CPM, implement mitigation measures to reduce the mortalities.

Verification: The CPM will review the Biological Resources Mitigation Implementation and Monitoring Plan submitted under condition of certification **BIO-5**. If the Biological Resources Mitigation Implementation and Monitoring Plan does not include the monitoring protocol listed above, the CPM will return the plan within 14 days to the project owner for revision. During operation of the project, the CPM or designee will determine via telephone or through visits to the project site, as deemed necessary, whether or not the project owner has complied with this condition.

The CPM will review each monitoring report and, as deemed necessary, ask the project owner to modify and/or clarify the report content and/or format.

If the project owner has not complied with any aspect of this condition, the CPM will notify the project owner of making this determination. If the project owner fails to correct any identified problem within a reasonable time, as determined by the CPM, the CPM will initiate the Energy Commission's complaint filing process.

For any necessary corrective action taken by the project owner, a determination of success or failure of such action will be made by the CPM after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIO-7 If necessary, the project owner, pursuant to Fish and Game Code Section 1603, shall acquire a Streambed Alteration Agreement from the California Department of Fish and Game for project impacts to drainages, and implement the terms of the agreement. If such an agreement is determined to be unnecessary by the California Department of Fish and Game, the project owner shall provide the CPM with written verification from the California Department of Fish and Game that this agreement is not necessary.

Verification: At least 45 days prior to the start of rough grading, the project owner shall provide the CPM with a copy of the California Department of Fish and Game Streambed Alternation Agreement or written verification that an agreement is not necessary for this project.

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SOIL & WATER RESOURCES

Joseph O'Hagan

INTRODUCTION

The Pittsburg District Energy Facility (PDEF), Limited Liability Corporation (applicant), proposes to construct and operate a 500 megawatt (MW) natural gas fired, combined cycle, cogeneration facility. The PDEF site is located on a 12-acre industrial site in the City of Pittsburg in eastern Contra Costa County. The proposed project also includes a 20-acre construction laydown area to the south of the proposed power plant site and a number of associated linear facilities. Short portions of several linear facilities cross into the City of Antioch and a portion of one transmission line route is within Contra Costa County.

This testimony analyzes the water and soil resource aspects of the PDEF, specifically focusing on the potential for the project to induce erosion and sedimentation, adversely affect water supplies, degrade water quality and increase the potential for flooding. This testimony also addresses the project's ability to comply with all applicable federal, state and local laws, ordinances and standards, identifies mitigation measures and recommends conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

CLEAN WATER ACT

The Clean Water Act (33 USC §1257 et seq.) requires states to set standards to protect water quality. Although water quality standards are to be met through the regulation of point source discharges to surface water, Section 307 of the Act and Code of Federal Regulations 403, requires that all non-domestic discharges to wastewater treatment plants must receive a pretreatment permit. This permit is to ensure that the discharge will not interfere with the treatment processes at the plant nor make the facility violate its own discharge permit limitations.

STATE

STATE WATER RESOURCES CONTROL BOARD

Under provisions of the Clean Water Act, the State Water Resources Control Board (SWRCB) adopted two general National Pollutant Discharge Elimination System (NPDES) Permits for control of stormwater runoff during construction and operation of industrial facilities, such as a power plant and associated facilities.

Under the General Construction Activity Storm Water Permit, developers are required to prepare and implement a Storm Water Pollution Prevention Plan

(SWPPP) if activities disturb greater than five acres. This plan identifies best management practices to reduce sediment, oil and other contaminants in stormwater discharges from the site. The general NPDES permit for Industrial Activities also requires developers of industrial facilities, such as power plants, to prepare and implement a SWPPP that identifies best management practices to reduce the discharge of contaminants from facility operation in stormwater discharge.

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the SWRCB which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (adopted by the SWRCB on June 19, 1976 by Resolution 75-58). This policy states that use of fresh inland waters should only be used for powerplant 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, in order of priority come from 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 goes on to address cooling water discharge prohibitions.

Section 13551 of the Water Code prohibits the use of "…water from any source of quality suitable for potable domestic use for nonpotable uses, including …industrial… uses, if suitable recycled water is available…" given conditions set forth in Section 13550. These conditions take into account the quality and cost of the water, the potential for public health impacts and the effects on downstream water rights, beneficial uses and biological resources.

Section 13552.6 of the Water Code states that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria, which must be taken into account by the SWRCB. These criteria are that: the quality and quantity of the reclaimed water are suitable for the use; the cost is reasonable; the use is not detrimental to public health; will not impact downstream users or biological resources; and will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that recycled water is available and meets the requirements set forth in section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary.

LOCAL

DELTA DIABLO SANITATION DISTRICT

Chapter 2.28 of the Subregional Sewer System Use Rules and Regulations sets forth the pretreatment requirements for non-domestic discharges to the sewer and wastewater treatment system.

CITY OF PITTSBURG GRADING ORDINANCE

The City of Pittsburg relies upon the Uniform Building Code, Chapter 70 for grading and erosion control.

CITY OF ANTIOCH

The Antioch Ordinance Code, Chapter 9, § 6-9.o1 et seq. controls non-stormwater discharges to the city's storm water system.

ENVIRONMENTAL SETTING

TOPOGRAPHY AND SOILS

The proposed PDEF power plant and associated facilities are located on low-lying alluvial fan and terrace deposits on the southern side of New York Slough, a branch of the San Joaquin River. Elevations at the 12-acre power plant site range from approximately nine to twelve feet above mean sea level. The topography and native soils present at the site have been extensively altered from excavation and fill activities. The site was formerly used to treat wastewater sludge from the steel mill (Woodward-Clyde 1998b). Soil in the sludge drying beds containing metals and organics were removed. Fill brought in to cover the site, apparently contained arsenic concentration above background levels (Mark Group 1998). Approximately eight acres, covering both the power plant site and the construction laydown area, are affected by the elevated arsenic levels and will require remediation. For further discussion of the soil contaminate issue, see the **Waste Management** and the **Public Health** sections of this Staff Assessment. The power plant site is being used as a spoil site for waste materials from other portions of the USS-Posco facility.

The topography and soils found at the 20-acre laydown area south of the power plant site and along most of the associated transmission, water and gas lines have also been altered from previous earth moving activities.

HYDROLOGY

Surface water bodies in the project vicinity are shown in the PDEF Application For Certification Figure 5.5-1 (PDEF 1998a). New York Slough, located north of the power plant site, is a three-mile long natural channel connected to the San Joaquin River on the east and Suisun Bay on the west. The slough is estimated to carry from one third to half the flow of the San Joaquin River. Other surface water bodies in the project vicinity include Kirker Creek, a channelized, ephemerial stream

located north of the power plant site that discharges into Dowest Slough. This slough is the former Kirker Creek channel before Kirker Creek was realigned for flood control. Dowest Slough, which discharges into New York Slough, is tidally influenced. For a more detailed discussion of the surface water setting of the proposed project, please consult the **Water Resources** section in the PDEF Application For Certification (PDEF 1998a).

In the project vicinity, groundwater is found in both a shallow and deeper aquifer. At the power plant site, groundwater is encountered approximately 10 feet below the surface (Woodward-Clyde 1998b). Groundwater samples from the shallow aquifer at the power plant site contain levels of antimony, lead and selenium in excess of maximum contaminate levels set for primary drinking water standards. Although not exceeding the primary drinking water standard, arsenic was encountered in wells down gradient of the site. Several volatile organic compounds were also encountered in wells at the power plant site in excess of primary drinking water standards (Mark Group 1998). These compounds, however, were also detected in wells upgradient of the project site and probably do not originate on-site.

The deeper, confined aquifer is found from approximately 90 feet to 140 feet below ground surface (Calpine 1998). Based upon information from two City of Pittsburg production wells, the groundwater quality of the deeper aquifer meets most drinking water standards (Calpine 1998). These wells are located 0.7 and 1.5 miles generally to the south of the power plant site. Groundwater contamination is, however, present within the deeper aquifer beneath the project site. Groundwater monitoring indicated levels of chlorine, magnesium and toluene exceeding secondary maximum contaminant levels for drinking water. Secondary levels are not health based, but refer to aesthetic criteria such as taste and odor. Since up-gradient groundwater monitoring indicated the presence of these compounds, their source is likely off-site. Based upon this, the Department of Toxic Substances Control agreed no further action regarding groundwater is required at the site (Mark Group 1998). Groundwater monitoring in the power plant vicinity will continue, however, for the USS-POSCO property (PDEF 1998).

WATER SUPPLY

THE CITY OF PITTSBURG

The City of Pittsburg receives approximately 80 percent of its water supply from the Contra Costa Water District (CCWD) via the 48-mile long Contra Costa Canal. This water source, a component of the federal Central Valley Project is diverted from the San Joaquin River. CCWD diverts on average 100,000 to 120,000-acre feet of water per year (Nolan 1999). This water is diverted under a contract with the U.S. Bureau of Reclamation that allows up to 195,000-acre feet per year to be diverted. Maximum capacity of the canal is 350 cubic feet per second. Other water contracts allow CCWD to divert approximately an additional 50,000 acre feet of water per year.

The City of Pittsburg's recent average water demand is about 10,300 acre feet per year (Nolan 1999; City of Pittsburg 1998). The majority of this water, approximately

8,300-acre feet of water per year is received from the Contra Costa Canal. The remaining water is supplied by two groundwater wells, which combined produce approximately 2,000-acre feet of water per year. In 1995, the city provided approximately 8.7 mgd (mgd). By 1997, this number had risen to approximately 9.5 mgd; an annual increase of approximately three percent. In 1998, however, slightly less water, 9.2 mgd, was treated than in the preceding year (Nolan 1999). The canal water is blended with the lesser quality groundwater at the city's water treatment plant, which has a capacity of 32 mgd. Current average demand at the treatment plant is approximately 16 mgd. Peak water demand has reached 17 mgd.

The Delta Diablo Sanitation District operates a sewage treatment plant that treats wastewater from the Cities of Pittsburg and Antioch and an adjacent unincorporated area. The treatment plant has an average daily dry weather flow capacity of 16.5 mgd. Currently, the plant treats and discharges approximately 12.5 mgd. Of this volume, all but one million gallons receives secondary treatment. Secondary treated effluent has had most settable solids and organics removed. The remaining 1.0 mgd consists of tertiary treated effluent. Tertiary treatment consists of the complete removal of organic material and suspended solids. For the wastewater treatment facility, tertiary treatment will be achieved through the use of additional filtration and possibly chlorination (Baatrup 1998).This level of treatment, however, does not remove metals, chloride compounds or nutrients such as nitrogen or phosphorus (Delta Diablo Sanitation District 1991). Expansion of the wastewater treatment facility's capacity to 25.7 mgd is anticpated by the year 2008 (Baatrup 1998). The treated effluent is discharged through an outfall into New York Slough. Within the cities of Pittsburg and Antioch, Delta Diablo has responsibility only for the interceptor (main) pipelines, while the two cities operate the sewer collection lines.

ENVIRONMENTAL IMPACTS

PROJECT SPECIFIC IMPACTS

WATER SUPPLY

Water for the proposed PDEF will be supplied by the City of Pittsburg and the Delta Diablo Wastewater Treatment Facility. Potable water from the city will be used for firewater, drinking water and sanitary facilities. Reclaimed water from the wastewater treatment facility will be used for all power cycle requirements, including cooling water makeup and heat recovery steam generator demineralized water.

RECLAIMED WATER

The proposed PDEF will require, under average operating conditions, approximately 3.4 mgd of tertiary treated recycled water from the wastewater treatment facility. Under maximum operating conditions, the demand for recycled water will rise to 3.7 mgd. Maximum conditions are anticipated to occur when ambient temperature equals or exceeds 85° F. The wastewater treatment facility's current capacity for tertiary treated wastewater is 1.0 mgd, which is not currently being used (Baatrup 1999). The effluent is discharged into New York Slough under an NPDES permit.

This permit is currently being renewed. The sanitation district anticipates filing additional information with the RWQCB in April that reflects the district providing effluent to the proposed project as well as to Calpine's proposed Delta Energy Center Project. To meet the PDEF's demand for recycled water, the tertiary treatment capacity of the plant will have to be expanded. The Delta Diablo Sanitation District (1991) prepared and certified an environmental impact report (EIR) to address potential impacts from expanding the wastewater treatment facility to provide recycled water to industrial users. This proposal involved adding additional filtration to the treatment process to meet tertiary treatment standards for the entire 16.5 mgd capacity of the plant and to treat 8.0 mgd of the effluent flow with a reverse osmosis process to provide an even higher quality water supply. With the exception of the existing 1.0 mgd of tertiary treatment capacity, this proposal was not implemented. The District feels that the addition of approximately 3.0-mgd of tertiary treatment capacity to meet the PDEF's requirements is addressed in this EIR (Baatrup1998). The additional tertiary treatment capacity can be provided by adding three 1.0-mgd treatment modules to the existing facility.

To provide recycled water to the proposed PDEF, the Delta Diablo Sanitation District must receive a General Water Reuse Permit from the San Francisco Regional Water Quality Control Board. This permit is in lieu of a Master Recycling Permit required by Section 13523 et seq. of the California Water Code. This permit allows the sanitation district to establish and enforce requirements for recycled water users such as the proposed PDEF. Delta Diablo Sanitation District has not yet filed a notice of intent (application) to the Regional Water Quality Control Board (Condit 1999).

POTABLE WATER

The potable water demand for the PDEF is estimated to be 20 gallons per minute or 32.25 acre feet of water per year. This potable water, for use in fire protection systems, drinking water, showers, and sanitary facilities, will be provided by the City of Pittsburg. As noted above, the City of Pittsburg provides approximately 10,000-acre feet of water per year from surface and groundwater sources. The city is not limited in the amount of water it can receive from the Contra Costa Water District (Nolan 1999). Currently, the city treats about 14 to 15-mgd, less than half the treatment plant's capacity of 32 mgd. This is an average figure. Maximum water demand in 1995 was approximately 17 mgd per day (City of Pittsburg 1998). Additional demand for potable water within the city is expected to grow from three to five percent per year (Nolan 1999). The city (1998) forecasts that potable water maximum demand will increase to over 25 mgd by the year 2015, an increase of approximately 47 percent. The additional 20 gallons per minute PDEF demand for potable water will not place a burden upon the city's potable water supply or treatment plant capacity.

The applicant identifies potable water as an alternative source for the heat recovery steam generator makeup water. (PDEF 1998a) PDEF has indicated, however, that recycled water from the wastewater treatment plant will be used in this process as well.

The exception to this is, in case of an interruption in the delivery of reclaimed water from the Delta Diablo Wastewater Treatment Facility, potable water from the City of Pittsburg will serve as the backup water source for the project (PDEF 1998a). While the average PDEF recycled water demand is 3.4 mgd, significantly less potable water would likely be required. This is because the better quality potable water could be cycled through the cooling process more often than the poorer quality wastewater effluent. Outages at the wastewater treatment facility are likely to be extremely infrequent and of a very short duration (Baatrup 1998). Thus, it is likely that project demand on the city's water supply when wastewater effluent is not available will not significantly affect the city's potable water supply. PDEF does not require potable water for the cooling and steam cycles, therefore, if water treatment plant capacity becomes a concern in the future, providing water directly from the Contra Costa Canal to the project may be an option.

WATER QUALITY

The proposed PDEF could adversely affect surface and groundwater through inadvertent spills and discharges during construction and operation. Wastewater discharges to the Delta Diablo Wastewater Treatment Facility may adversely affect treatment processes or cause the facility to exceed its own discharge limitations.

WASTEWATER

Wastewater discharge flows from the proposed PDEF that will be discharged to the Delta Diablo include cooling tower blowdown, evaporative cooler blowdown, heat recovery steam generator blowdown, demineralizer water treatment backwash and neutralization facility effluent. These waste streams will be collected in the cooling tower basin and discharged directly to the wastewater treatment facility by a dedicated pipeline. This discharge is estimated to be approximately 757 gpm (PDEF 1998a; Patch 1998d). This wastewater flow of approximately one mgd represents approximately 25 percent of the remaining capacity of the Delta Diablo Wastewater Treatment Facility. The wastewater treatment facility has adequate capacity to accommodate the PDEF discharge and, therefore, the project will not contribute to a project specific impact on treatment plant capacity. The potential for PDEF to contribute to a cumulative impact on the wastewater treatment plant and water quality is discussed below.

SOIL & WATER RESOURCES Table 1 shows the anticipated constituents of this wastewater stream, predominately metals, based upon the quality of the recycled water from the wastewater treatment facility.

PDEF has applied to the Delta Diablo Sanitary District (Patch 1998d) for an industrial discharge permit. This permit is required for industrial discharges to the district's sewer system to ensure such discharges do not inhibit or disrupt treatment plant processes or cause violations of the district's discharge permit. Wastewater discharges sent to the wastewater treatment facility through a dedicated pipeline consist primarily of blowdown from the cooling towers, heat recovery steam generator and the evaporative cooler (PDEF 1998a). Runoff from plant drains and water treatment backflush will also be discharged to the wastewater treatment plant through this pipeline. Specific flow rates for each of these waste streams are shown

in Table 3.4.5-1 of the AFC (PDEF 1998a). This table shows that average discharge flows will be 0.972 mgd while peak discharges will be 1.09 mgd. The total dissolved content of these wastewater streams in shown in the AFC (PDEF 1998a) in Table 3.4.6-4.

SOIL & WATER RESOURCES Table 1
Source and Discharge Water Quality

Constituents	Inflow Concentration (mg/L)	Outflow Concentration (mg/L)
Aluminum	<0.1	<0.3
Antimony	<0.1	<0.3
Arsenic	<0.004	0.012
Barium	0.012	0.036
Bicarbonate	230	690
Beryllium	<0.01	<0.03
Cadmium	<0.01	<0.03
Calcium	43	129
Carbonate	2	6
Chloride	228	684
Chromium	<0.008	<0.024
Copper	<0.007	<0.021
Fluoride	0.7	2.1
Hydrocarbons	<3	<9
Iron	0.29	0.87
Lead	<0.022	<0.066
Manganese	0.135	0.405
Magnesium	26	78
Mercury	<0.0002	<0.0006
Nitrate (as NO3)	<0.1	<0.3
Ph	7.0	9.0
Potassium	15	45
Selenium	<0.007	<0.021
Silica	0.026	0.078
Silver	<0.005	<0.015
Sodium	195	585
Sulfate	195	585
Total Alkalinity (as CaCO3)	217	651
Total Dissolved Solids	850	2550
Total Hardness (as CaCO3)	294	882
Total Suspended Solids	8	24
Turbidity	0.5 NTU	1.5 NTU
Zinc	0.0125	0.0375
Biochemical Oxygen Demand	10	30
Chemical Oxygen Demand	57	171

The water quality of the combined discharge is shown in **SOIL & WATER RESOURCES Tables 1 and 2** above. The Delta Diablo Sanitation District has set pretreatment standards for such discharges, also shown in the table. As seen in the second table, the estimated PDEF discharge meets all applicable pretreatment standards required by the sanitation district. The values shown in the table are based upon three cycles of concentration through the PDEF cooling process. The limit for several constituents, such as cadmium or zinc, may preclude the project from cycling the cooling water any more than this.

In addition to the standards listed in this table, the project must meet the average chemical oxygen demand (COD), total suspended solids (TSS), total dissolved solids (TDS), oil and grease and temperature values shown in this table.

The Delta Diablo Sanitation District deemed the PDEF pretreatment permit application satisfactory and feels the project will meet all applicable standards. In addition to meeting the sanitation district's pretreatment standards, the PDEF wastewater discharge will meet the applicable pretreatment standards for new steam electric power generating sources. As noted above, the district (1991) completed an EIR addressing adding tertiary treatment to the entire discharge flow of the facility (16.5-mgd) and

SOIL & WATER RESOURCES Table 2
Discharge Limitations

Constituents	Estimated Discharge	Pretreatment Limits
Arsenic	0.012	0.53
Cadmium	<0.03	0.10
Chromium	<0.024	0.50
Copper	<0.021	0.50
Iron	0.87	15.00
Lead	<0.066	0.50
Mercury	<0.0006	0.01
Selenium	<0.021	2.0
Silver	<0.015	0.20
Zinc	0.0375	1.0

Sources: PDEF (1998k); Patch (1998d)

additionally using reverse osmosis treatment on approximately half the facility's capacity (8-mgd). In addition, approximately 20 gpm of wastewater will be discharged by PDEF to the sanitary sewer system.

Other potential water quality impacts from the PDEF include discharge of hydrostatic test water from pipelines and the power plant and dewatering activities associated with excavation activities. Mitigation measures for these activities are discussed below.

PDEF proposes to cap arsenic contaminated soils at the proposed power plant and construction lay down area with clean fill. To raise the power plant pad to 12 feet above mean sea level a significant amount of fill will need to be imported. At the construction laydown area, two feet of fill will be brought in to cap the site. Capping the soil is the Department of Toxic Substances Control approved remediation measure for control of arsenic contaminated soil. The potential for this contaminant to migrate from the soil to the shallow aquifer was evaluated as part of the Resources Conservation and Recovery Act (RCRA) efforts. It was determined that soil capping would provide adequate groundwater protection. The Phase I Environmental Site Assessment (Montgomery-Watson 1998) does recommend that any fill be tested for the presence of contamination

Stormwater Discharge and Drainage

Discharge of stormwater contaminated with sediment or other pollutants resulting from construction and operation of the PDEF may lead to the degradation of surface and groundwater and soils. Diversion of stormwater runoff to unprotected areas may cause erosion. Existing drainage of the proposed PDEF site is generally to the north. As indicated above, construction of the power plant site will involve earth-moving activities to remove unsuitable fill material. To raise the base elevation for the power plant pad to 12 feet above mean sea level will require a significant amount of fill material to be brought in. Unprotected fill material is highly susceptible to erosion. Given the presence of soils with elevated levels of arsenic, stormwater runoff control is especially important.

To control stormwater runoff, the applicant has prepared a preliminary erosion control and stormwater management plan (PDEF 1998f). This plan identifies potential best management practices to ensure sediment and other pollutants are not carried off-site by stormwater runoff. This plan is discussed further below under mitigation. Since greater than five acres are to be disturbed during construction of the proposed project, the applicant will have to file a notice of intent with the State Water Resources Control Board to comply with the provisions of the General Construction Activity Stormwater Permit. The general permit requires the identification and implementation of best management practices to control runoff.

Runoff from the developed power plant pad will be conveyed to the north by two existing 18 inch lines which feed into an existing 24 inch line which discharges into New York Slough (PDEF 1998a). The applicant proposes that site drainage be sized to accommodate a 10-year, 24-hour storm (PDEF 1998a). City of Pittsburg standards, however, require the design storm to be the 100-year, 24-hour event. This raises concern about whether the existing 18-inch and 24-inch lines are of sufficient size to accommodate this level of runoff. Once developed, approximately 20 percent of the power plant site will be covered with impervious surfaces. Based upon the 10-year, 24-hour storm, the applicant estimates runoff would increase 400 percent after construction (PDEF 1998a).

Erosion and Sedimentation

Accelerated wind and water induced erosion may result from earth moving activities associated with construction of the proposed project. Removal of the vegetative cover and alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Although many of the native soils that will be affected by the project have low or moderate wind and water erosion potential, once disturbed, all of these soils are vulnerable to erosion. Rainfall may be intense, which greatly enhances the potential for water erosion. Grading activities may redirect runoff into areas more vulnerable to erosion. Areas where linear facilities cross drainages are especially vulnerable to erosion. During project operation, wind and water action can continue to erode unprotected surfaces. An increase in the amount of impervious surfaces can increase runoff, leading to the erosion of unprotected surfaces.

Table 3.6-2 of the AFC (PDEF 1998a) shows the estimated disturbance for all elements of the proposed project during construction and operation. Prior to construction at the PDEF power plant site, debris piles present at the site will be removed. The site will then be graded and sufficient fill brought in raise the elevation of the plant block site to 12 feet above mean sea level see **Facility Design** section). The construction laydown area will also be leveled and covered with two feet of fill to remediate the arsenic contamination problem. The site will then be covered with gravel for dust control. A temporary stormwater detention basin will be constructed at the site during the early phases of development to ensure sediment laden runoff does not leave the site.

The proposed transmission lines and pipelines will either parallel existing utilities and roads or traverse developed industrial lands with little slope. Road and pipeline construction will also require grading and excavation. Spoil piles associated with pipeline construction are especially vulnerable to erosion. Trenching and soil stockpiles will be protected with hay bales or silt fences tarps and dust suppression measures. Topsoil will selectively be set aside for revegetation. Revegetation efforts will include all disturbed access roads. Project elements that cross Kirker Creek and Dowest Slough will use existing roadways to avoid impacts to these drainages. The applicant has provided a draft plan that identifies measures to minimize erosion and control stormwater runoff (PDEF 1998k). This plan is discussed further under the mitigation section below.

FLOODING

A major portion of the proposed power plant site was identified as being within the special 100-year flood hazard zone (PDEF 1998a;k). The designation, AE, identifies areas for which the base flood plain elevation has been calculated; for the power plant vicinity, this elevation is seven feet (Federal Emergency Management Agency 1989). Therefore, to ensure that the site is not subject to flooding during a 100-year event, the base elevation for the power plant site will be raised to 12 feet above mean sea level (PDEF 1998k). Elevating a portion of the proposed site outside of the 100-year flood plain will not raise floodwaters to the extent where they will affect areas that would not be impacted otherwise.

Linear elements of the proposed project also cross 100-year flood hazard areas designated AE. These areas are shown in Figure 5.5-2 and include portions of the proposed 115 kV interconnect to the PG&E substation (Routes 10, 10A), portions of the reclaimed water supply and wastewater return lines (Routes 4, 5) and the proposed fuel gas line (Route 6) (PDEF 1998k). With the exception of the 115 kV line, all of these project elements are pipelines and will be buried. Towers for the 115 kV lines will be either 130 or 150 foot single pole or steel lattice. Floodwater displacement caused by the transmission line tower would not be sufficient to raise floodwater elevations and adversely affects areas that would otherwise would not be impacted.

CUMULATIVE IMPACTS

The proposed PDEF will use tertiary water from the Delta Diablo Wastewater Treatment Facility. The wastewater treatment facility can easily expand to meet the

project's peak demand for tertiary treated effluent. The project will use potable water from the City of Pittsburg that can easily accommodate project specific and anticipated future demand. This source is also identified as a backup for project water supply if effluent from the wastewater treatment plant is not available. Since such interruptions are very infrequent and of short duration, this should not be an adverse impact on the city's water supply or treatment plant capacity. If water treatment capacity becomes an issue, the applicant could consider using an alternative water source for backup since water for the project uses does not need to be potable quality. Since PDEF does not appear to be contributing to a significant cumulative impact, staff is not recommending use of alternative sources as a mitigation measure.

Wastewater from the proposed project will be returned from the PDEF to the wastewater treatment plant. This flow, roughly one mgd, represents approximately 25 percent of the remaining capacity at the treatment plant. Given anticipated growth, however, the wastewater treatment plant should have sufficient capacity to meet future demand. If treatment plant capacity becomes a problem, wastewater from PDEF could either be routed directly to the wastewater treatment plant outfall or a dedicated outfall for the project for discharge to New York Slough. Another alternative would be for the wastewater to be routed to bypass most of the treatment processes at the wastewater treatment facility. Wastewater treatment plant processes are intended to deal with biological waste, which is not an issue for PDEF wastewater, with the exception of the minor sanitary wastewater discharge from the facility. Once again, since staff has not identified that PDEF is contributing to a cumulative impact on wastewater treatment facility capacity and is therefore, not recommending this as a mitigation measure.

The effects of the proposed project in conjunction with the proposed Delta Energy Center on water quality in New York Slough cannot be determined at this point in time. Although the proposed PDEF will discharge wastewater to the wastewater treatment plant, there is a potential for cumulative impacts to water quality.

The demand for tertiary treated effluent (roughly ten mgd) by the two power plant project represents approximately 72 percent of the treatment plant's existing flow. Approximately 28 percent of the effluent used by PDEF will be returned to the wastewater treatment plant. For Delta Energy Center, approximately 40 percent will be discharged to the treatment plants outfall with the remaining three mgd of secondary treated effluent from the wastewater treatment plant. The problem is that these reduced flows from the power plants will be carrying a substantial portion of the concentrated inorganic constituents that was contained in the original total effluent flow. Therefore, while overall pollutant loading will not increase because of the two projects, discharge concentrations will increase. The Delta Diablo Sanitation District is required to renew the NPDES permit for the wastewater treatment plant. Regional Water Quality Control Board staff anticipates a revised permit renewal application reflecting the two proposed power plant projects in early April 1999 (Moghbel 1999). Until this information is filed, and additional information is provided regarding the Delta Energy Center to the Energy Commission, staff cannot make a determination on the potential for PDEF to contribute to significant cumulative water quality impacts.

FACILITY CLOSURE

A planned, unexpected temporary or permanent closure of the proposed PDEF should not be a significant concern if site drainage and erosion are properly dealt with for any potential closure. Proper closure of the cooling tower basin is also required. Unexpected permanent closure may raise the potential for drainage and erosion problems due to a lack of maintenance of the facilities. Staff will require PDEF to address this concern in their closure plan.

MITIGATION

PDEF PROPOSED MITIGATION

WATER SUPPLY AND WATER QUALITY

The applicant will comply with all requirements for use of tertiary treated effluent and comply with all requirements set forth in the pretreatment permit (PDEF 1998a). PDEF (1998g Data Response 33.a.) indicates that it will evaluate additional site characterization information from work planned by USS-POSCO. If this information suggests additional groundwater monitoring is required, PDEF will consider installing new monitoring wells. Groundwater encountered during excavation will be collected, tested and disposed of in compliance with applicable laws and ordinances.

EROSION CONTROL AND STORMWATER RUNOFF

The applicant has prepared a draft erosion control/stormwater management plan (PDEF 1998a; k). Measures in the plan identified to control erosion and sedimentation: straw bale dikes, straw check dams, silt fences, stormwater detention basins, preservation of existing vegetation, mulching and permanent seeding, runoff routing away from disturbed areas, and storm drain inlet protection measures.

Measures identified in the plan for stormwater quality control include: stabilization of construction entrance and roadways with gravel; compaction of access road surfaces, use of sediment basins or filtration to remove sediment from water; use of covered or indoor storage of hazardous materials; use of covered dumpsters and contains for waste collection; perform vehicle fueling and maintenance in areas away from storm drainage system; performance of fueling offsite whenever possible; use of designated bermed areas to wash tools and equipment used for painting, stucco work, drywall, asphalt and concrete; and proper disposal and/or recycling of wastes generated during construction and operation.

The control of non-stormwater related pollution discharges will be accomplished by having one designated temporary waste storage area during construction activities. This area will be contained within earthen berms or some other barrier. All non-hazardous wastes will be collected within the waste storage area. The best management practices to prevent non-stormwater waste discharges which the

applicant has committed include: monitoring of all vehicle and equipment maintenance activities on site; minimizing discharge of paints and related products wastes; constructing secondary containment for all hazardous material delivery and storage areas; providing adequate employee training for the use of hazardous material including but not limited to fuel, oil, asphalt and concrete compounds, acids, glues, paints and solvents; developing and implementing a spill prevention and control plan; ensuring that the appropriate spill cleanup material area be readily available at all times; removing of construction wastes frequently, storing all liquid wastes in covered containers; using portable toilet facilities managed by licensed contractors; and restricting vehicle and equipment washing to designated areas.

Wind erosion will be mitigated by implementation of a final dust control plan which will be developed to address permitting conditions imposed by the Bay Area Air Quality Management District and the California Energy Commission. The applicant has committed to using rubber tire vehicles and periodic watering, when necessary, to control dust that may be generated by travel on any unpaved area, unless it is covered with gravel.

The applicant will ensure that all contractors generating hazardous wastes comply with all state and federal regulations regarding hazardous wastes. The final construction stormwater pollution prevention plan will identify specific pollutant sources and measures which will to be employed to reduce or eliminate discharges to the environment. The applicant will ensure that all contractor and subcontractor personnel are trained in the components and goals of the NPDES construction permit, will verify that all contractors and subcontractors maintain records of employee training and will obtain certification from each contractor that they understand the requirements of NPDES permitting prior to working on the PDEF site.

The applicant will designate a responsible contractor to ensure that all erosion control measures described in the final erosion control plan are implemented. The specified Environmental Control Supervisor will monitor all contractor and subcontractor's implementation of the erosion and sedimentation control measures. The designated contractor will verify that implementation of the final erosion control plan is successful and that erosion is controlled and transport of sediment prevented. Additionally, inspections will be performed as required by the General Construction NPDES Permit and the results of inspections including references to any additional measures necessary to prevent erosion and sediment transport documented. The project applicant will ensure that records of these reports are retained for a period of 3 years after the completion of final site stabilization or submitted to the San Francisco Bay Regional Water Quality Control Board in cases of non-compliance with NPDES permits limitations.

Staff finds these measures will reduce all potential significant project specific impacts to insignificant levels.

The staff recommended conditions of certification are to ensure proper implementation of the proposed mitigation measures and compliance with applicable laws, ordinaces and standards.

APPLICABLE LAWS, ORDINANCES, POLICIES AND STANDARDS

The proposed PDEF will comply with all applicable laws, ordinances, policies and standards.

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that the proposed PDEF will not contribute to any significant project specific impacts to soil and water resources. Use of recycled wastewater from the Delta Diablo Waste Water Treatment Facility for most of the project's water demand is a beneficial use of this water source. Staff is still evaluating cumulative impacts to water quality. This information will be submitted in the supplemental information to be filed in April.

CONDITIONS OF CERTIFICATION

SOILS&WATER 1: Prior to beginning any clearing, grading or excavation activities associated with project construction, the project owner will develop and implement a Storm Water Pollution Prevention Plan.

Verification: Two weeks prior to the start of construction, the project owner will submit to the Energy Commission Compliance Project Manager (CPM) a copy of the Storm Water Pollution Prevention Plan.

SOILS&WATER 2: Prior to the initiation of any earth moving activities, the project owner shall submit an erosion control and stormwater management plan for City of Pittsburg Community Development Department and Energy Commission staff approval. The final plan shall contain all the elements of the draft plan with changes made to address the final design of the project. The plan shall reflect that all permanent on-site drainage facilities are sized to accommodate the 100 year, 24-hour storm and identify any off-site measures needed to accommodate this discharge.

Verification: The final erosion control plan shall be submitted to the City of Pittsburg Community Development Department and the Energy Commission CPM for approval 30 days prior to the initiation of any earth moving activities.

SOIL&WATER 3: Sixty days prior to commercial operation, the project owner must submit a notice of intent to the State Water Resources Control Board to indicate that the project will operate under provisions of the General Industrial Activity Storm Water Permit. As required by the general permit, the project owner will develop and implement a Storm Water Pollution Prevention Plan.

Verification: Two weeks prior to the start of construction, the project owner will submit to the Energy Commission CPM a copy of the Storm Water Pollution Prevention Plan.

SOIL&WATER-4: The project owner shall provide a copy of the approved pretreatment permit from the Delta Diablo Sanitation District to staff and notify the Energy Commission CPM of any changes to the permit.

Verification: Within thirty (30) days of receiving the Pretreatment Permit from Delta-Diablo Sanitation District, the project owner shall submit a copy to the Energy Commission CPM. The project owner shall notify the Energy Commission CPM in witting of any proposed changes to the permit, either initiated by the project owner or by the district.

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PALEONTOLOGIC RESOURCES

Testimony of Gregory M. Newhouse

INTRODUCTION

This analysis discusses the potential impact of the proposed Pittsburg District Energy Facility (PDEF) project upon paleontologic resources, which include the fossilized remains or trace evidence of prehistoric plants or animals preserved in soil or rock. These resources may be found nearly anywhere in California and are becoming increasingly vulnerable to continuing development within the state. Paleontologic resources are considered non-renewable resources, because the plants and animals they represent were extinct long before the present.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

STATE

California Environmental Quality Act (CEQA) Guidelines: California Code of Regulations, Section 15000, *et seq*, Appendix G (V)(c), specifically defines a potentially significant environmental effect as occurring when the proposed project will "...disrupt or adversely affect...a paleontological site, except as part of a scientific study."

In addition to the CEQA guidelines, the Energy Commission has regulations pertinent to paleontological resources assessment and management. These regulations are found in Title 20, California Code of Regulations, Division 2, Chapter 5, Article 6, Appendix B, (g)(16).

STANDARDS

The Society of Vertebrate Paleontologists (SVP) Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures dated 1996. The Standard Procedures calls for resource assessment and mitigation program to be developed by a paleontologist.

ENVIRONMENTAL SETTING

To determine the environmental setting and the likely significance of existing paleontologic resources, the applicant undertook a literature and records search and a site sensitivity assessment. The site assessment included an area of up to.25 miles about the power plant site and linear facilities. Staff has reviewed and determined the assessment appropriate as it was accomplished in concert with federal and state criteria and the draft guidelines and significance criteria issued in 1989 by the Society for Vertebrate Paleontology. The methods and results are documented on AFC pages 5.8-4 through 5.8-8.

The environmental setting of the overall PDEF project area is underlain by surficial sedimentary units of predominantly Pleistocene and Holocene to Recent age. The

substructure of these units is characterized by sand, gravel, silts and clay that are all potentially favorable to the preservation of paleontological resources. In addition, "gradual, long-term erosion and previous construction activity have removed parts of the recent soil cover so that Quaternary rock units and their contained fossils are now at or near the surface throughout most of the project area." (PDEF, 1998) Though no known paleotologic sites exist within 0.25 miles of the project area, sites within 1 mile of the project area "contain scientifically important paleontological resources that represent a wide variety of terrestrial and aquatic vertebrate taxa including camel, bison, and rodent mammalian taxa." (PDEF, 1998)

In contrast to the overall project area, the actual proposed power plant site and laydown areas are composed predominantly of fill materials. In fact few undisturbed areas of native soil exist on the site. Through the use of recent geotechnical studies, the power plant site and laydown area have been assigned a "low sensitivity rating, since shallow excavations (10-foot or less) are predicted to unearth only artificial fill material." (PDEF, 1998) Staff agrees with this sensitivity rating. In addition, much of the area traversed by the proposed transmission lines, offsite pipelines and truck bypass road are a mix of vacant, paved and developed lands. During the applicant's site assessment, no fossil materials were observed along any of the proposed routes.

IMPACTS

SIGNIFICANCE CRITERIA FOR PALEONTOLOGIC RESOURCES

Significant paleontologic resources are those that meet established scientific criteria which are generally accepted by professional paleontologists. Nearly all vertebrate fossils are considered to be significant, as well as many invertebrate fossils, footprints and other faunal impressions, and various types of floral impressions and root casts.

The following criteria are considered by professional paleontologists when making a determination of significance for paleontologic materials recovered from areas of fossil-bearing sediments. This list is a combination of criteria published by Repenning (1980) and Petty (1978) and is not arranged in order of significance; resource materials may meet one or more of the criteria. A paleontologic resource (specimen, sample, or deposit) shall be considered significant if it meets any of the following criteria:

- It represents a rare species or one that has not been recorded previously in the literature.
- It illustrates previously unknown sexual dimorphism, phenotypic variation, or an ontogenic series of a given taxon.
- It is from a locality that marks either a geographical or temporal range extension for given species.

- It is exceptional in that it represents an exhibit-quality specimen.

- It represents material that assists in refining the age assignment of an otherwise poorly dated litho-stratigraphic unit.

- It represents a concentration of vertebrate specimens in a bed or series of beds. The sample may include either associated skeletal material referable to an individual or an aggregate of specimens referable to more than one individual. In either case, the material yields potentially significant taphonomic information that can be utilized in paleontologic resource analyses.

- It provides important information of the evolutionary trends among organisms, relating living inhabitants of the earth to extinct organisms.

- It provides important information regarding development of biological communities or interaction between botanical and zoological biotas.

- It demonstrates unusual or spectacular circumstances in the history of life.

- It is in short supply and in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and is not found in other geographic locations.

- All vertebrate fossils are of scientific value.

IMPACTS TO PALEONTOLOGIC RESOURCES

The potential for significant project impacts to paleontologic resources is directly related to likelihood that such resources would be present in areas affected by the project and whether any such resources are actually encountered during project development activities. Often the significance of the fossil materials found during project construction activities, remains uncertain until the ground surface has been broken and excavation of sub-surface soils takes place. Staff's objective is to ensure that there will be no adverse impacts to significant paleontologic resources during project development, construction, and operation.

Site clearance and grading associated with the power plant site preparation and the excavations and foundation development associated with power plant construction will likely only have a limited impact. The maximum excavation will be 12-15 feet and the site has a maximum 10 foot fill depth. The extent of impact to paleontologic resources will depend on the exact nature of materials encountered below the fill material. The proposed mitigation measures and subsequent conditions of certification address this circumstance to ensure no significant impact.

OFFSITE PIPELINES

The steam pipeline will be constructed above ground and will have no impact. Both the underground reclaimed water line and the alternate underground water pipeline

have a high sensitivity for encountering paleontologic resources where their routes are not in fill material. The proposed mitigation measures and subsequent conditions of certification ensure no significant impact due to their construction.

ELECTRIC TRANSMISSION LINE ROUTE(S)

Construction of foundations for the transmission structures will require drilling of the soil to variable depths for each power pole. The depth of soil disturbance will depend on the height and diameter of the individual poles designed for each portion of the route. The width and extent of surface soil disturbance would depend upon the size of equipment needed to set and erect the poles. While no surface evidence of fossil materials was observed during pre-AFC surveys of the proposed transmission routes, construction could encounter the inter-mingled mix of fossil-bearing sediments identified in the literature and records searches. The proposed mitigation measures and subsequent conditions of certification ensure no significant impact due to their construction.

CUMULATIVE IMPACTS

The sediments and fossil materials found in the project area can yield valuable and significant resources. The continuation of additional development can accelerate the disturbance of fossil-bearing sedimentary deposits and the potential loss of such paleontologic resources. The degree of cumulative impact is related to the increasing disturbance or removal of fossil-bearing rock units.

At the same time, with proper planning and appropriate mitigation, proposed developments can help to preserve valuable fossil resources and can also provide opportunities for increasing our understanding of the past environmental conditions and life-forms. Examination of excavations by a professional paleontologist will allow for the collection of the necessary information to help in the interpretation of the geologic history of the region.

FACILITY CLOSURE

The anticipated lifetime of the PDEF project is expected to be in excess of thirty years. At the time of closure all then-applicable LORS will be identified and the closure plan will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to paleontologic resources would be expected. These same circumstances would apply should an emergency unplanned closure occur or the facility be abandoned.

MITIGATION

Mitigation measures are developed to reduce the potential for significant adverse project impacts on the paleontologic resources to a less than significant level. The measures are derived from good professional practice and are based on the guidelines of the Society of Vertebrate Paleontologists (SVP) and Commission staff experience. All of these mitigation measures have previously proven successful in

protecting sensitive paleontologic resources from construction-related impacts, while allowing the timely completion of many projects in California.

APPLICANT'S PROPOSED MITIGATION

The AFC indicates that limited construction monitoring combined with a five-point paleontologic resource-monitoring program is warranted. This five-point program is presented in the AFC, Section 5.8.3. Staff have reviewed this program and found it to be consistent with appropriate paleotologic practices and has incorporated it, with some additions and clarifications, into the proposed conditions of certification. The main components of the program are as follows:

- Reduction of Impact Through Design Modification.
- Protection During Construction Through Access Restrictions, Construction Restrictions.
- Construction Crew Education
- Emergency Discovery Procedures
- Paleontological Monitoring, Construction Period Sampling, and Data Recovery.

STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed in the AFC. However, staff has also suggested additional language to clarify those measures. The changes would extend the mitigation contingency planning to address the following aspects in greater detail:

- The selection criteria for the designated paleontologic resource specialist.
- The steps involved in the recovery, analysis, preparation and identification of fossil materials that were encountered during project construction.
- The inventory and curation of any fossil materials recovered.
- The preparation and filing of reports on the resource monitoring and mitigation activities.

Staff has also drawn upon the requirements and criteria set forth in the mitigation and curation guidelines of the Society of Vertebrate Paleontologists.

These mitigation requirements and guidelines have been incorporated into the proposed Conditions of Certification that follow below.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Portions of the project area contain sand, gravel, silts and clay that are all potentially favorable to the preservation of paleontological resources. In addition, important paleontologic resources have been found within the region about the project. Therefore, monitoring and mitigation for the presence of significant fossil materials and implementation of full data and fossil recovery are essential to reduce the potential for project impacts to paleontologic resources to a less than significant

level. Provided that the proposed conditions of certification are adopted, the proposed project will comply with all applicable LORS and not result in any significant adverse impacts.

RECOMMENDATIONS

Staff recommends that the Energy Commission adopt the proposed conditions of certification, to ensure adequate mitigation of potential impacts to sensitive paleontologic resources during the construction of the Pittsburg District Energy Facility.

PROPOSED CONDITIONS OF CERTIFICATION

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resources specialist approved by the Commission Compliance Project Manager (CPM), is available for field activities and prepared to implement the Conditions of Certification.

The designated paleontological resources specialist shall be responsible for implementing all the Conditions of Certification and for using qualified personnel to assist in this work.

The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resources specialist.

The statement of qualifications for the designated paleontological resource specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology, or paleontological resource management; at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resources specialist are not in concert with the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resources specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resources specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the

preceding designated paleontological resources specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least ninety (90) days prior to the start of construction on the project, the project owner shall submit the name and resume and the availability for its designated paleontological resources specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resources specialist.

PAL-2 At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Prior to the start of project construction, the designated paleontological resource specialist shall prepare a draft Paleontological Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources. The CPM will review and must approve in writing, the Paleontological Resources Monitoring and Mitigation Plan. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed throughout project construction.

The Paleontological Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification, and inventory; preparation of final reports, and transmittal of materials for curation.

- An identification of the person(s) expected to assist with each of the tasks identified in (a), above, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities.

- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and schedule for the monitoring.

- The designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined.

- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits.

- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the "Society of Vertebrate paleontologists (SVP) standards and requirements for the curation of paleontological resources.

- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work. Discussion of any requirements or specifications for materials delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution.

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist. The CPM shall provide written approval or disapproval of the proposed Paleontological Resources Monitoring and Mitigation Plan within 15 days of receipt of the submittal. If the plan is not approved, the project owner, the designated paleontological resources specialist, and the CPM shall meet to discuss comments and work out necessary changes.

PAL-3 Prior to the start of project construction, the designated paleontological resources specialist shall prepare and conduct an employee training program. The project owner shall submit the paleontological resources training program to the CPM for review and approval.

The paleontological training program will discuss the potential to encounter fossil resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if sensitive paleontological resources are encountered during project activities. The training program will be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least thirty days (30) prior to the start of project construction, the project owner shall submit to the CPM (or designee) for review, comment, and written approval; the proposed employee training program and the set of reporting

procedures the workers are to follow if paleontological resources are encountered during project construction.

The CPM shall provide the project owner with written approval or disapproval of the employee training program and set of reporting procedures. If the draft employee training program and set of procedures are not approved, the project owner, the designated paleontological resources specialist, and the CPM shall meet to discuss comments and work out necessary changes.

PAL-4 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall provide the CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Verification: Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resources specialist shall present the CPM-approved paleontological resources training program. The training shall include a set of reporting procedures for paleontological resources encountered during project activities. The project owner shall provide documentation to the CPM in the Monthly Compliance Report, that the employee training and the set of procedures have been provided to all project managers, construction supervisors, and to all workers. Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-5 The designated paleontological resource specialist shall be present at times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified.

If the designated paleontological resources specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner of the changes.

Verification: The project owner shall include in the Monthly Compliance Reports to the CPM, a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-6 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for

curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Final Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-7 The project owner shall ensure preparation of a Final Paleontological Resources Report by the designated paleontological resources specialist. The Final Paleontological Resource Report shall be completed following completion of the analysis of the recovered fossil materials and related information. (If no materials were found, the final report can simply be a brief statement to that fact.) The project owner shall submit the final paleontological report to the CPM for written approval.

The final report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered determinations of sensitivity and significance; and statement by the paleontological resources specialist that project impacts to paleontological resources have been mitigated.

Verification: The Final Paleontological Resources Report shall be submitted under a cover letter stating that it is to a confidential document. The report is to be prepared by the designated paleontological resources specialist for the project, within 90 days following completion of the analysis of the recovered fossil materials. The project owner shall submit a copy of the Final Paleontological Resources Report to the CPM for review and written approval.

PAL-8 The conditions for certification for closure will be determined when a closure and postclosure maintenance plan are submitted to the CPM twelve months prior to closure of the facility.

The closure requirements for paleontological resources are to be based upon the Final Paleontological Resources Report and the proposed grading activities for closure.

A description regarding closure activities potential to impact paleontological resources is to be included in the closure plan. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required.

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FACILITY DESIGN

Testimony of Steve Baker, Kisabuli, Bob Anderson and Al McCuen

INTRODUCTION

The purpose of the Facility Design analysis is to verify that applicable laws, ordinances, regulations and standards (LORS) have been identified and that the project and ancillary facilities have been described in sufficient detail, including design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety.

This analysis also examines whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety, environmental protection or the operational reliability of the project. This analysis further establishes conditions of certification to ensure that a design review and construction inspection process will be employed that carries out the intent of the LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written decision . . . which includes . . . (a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities . . . with public safety standards . . . and with other relevant local, regional, state and federal standards, ordinances, or laws. . . (Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects covered in this analysis include:

- identification of the LORS applicable to facility design;
- evaluation of the applicant’s proposed design criteria, including the identification of those which are essential to ensuring protection of the environment and/or public health and safety;
- proposed modifications and additions to comply with applicable LORS; and
- conditions of certification proposed by staff to ensure that the project will be designed and constructed to comply with all applicable LORS, and protect environmental quality and assure public health and safety.

SETTING

The applicant proposes to construct and operate the Pittsburg District Energy Facility (PDEF), a 500 megawatt (MW) power plant in Pittsburg, California. The PDEF is located on alluvium and is in seismic zone 4, as delineated on Figure 16-2 of the 1998 California Building Code (CBC). There is a significant amount of fill material at the power plant and construction laydown areas. A discussion of the relevance of the seismic zone delineation and the materials at the site are presented in the geological hazard section below. Additional engineering details of the proposed project are contained in the Application for Certification (AFC), in Appendices C through H (PDEF 1998a).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicable LORS proposed by the applicant are contained in the AFC, in Section 7 and Appendices C through H (PDEF 1998a). A summary of these LORS include: Title 24, California Code of Regulations, which adopts the current edition of the CBC as minimum legal building standards; the 1998 CBC for design of structures; the 1996 Structural Engineers Association of California's Recommended Lateral Force Requirements, for seismic design; ASME-American Society of Mechanical Engineers Boiler and Pressure Vessel Code; and NEMA-National Electrical Manufacturers Association.

ANALYSIS

The basis of this analysis is the applicant's proposed analysis methods, construction methods, and list of LORS and design criteria set forth in the AFC. Applicable engineering sections include:

Section 1.4 Project Schedule
Section 1.5 Project Ownership
Section 3 Facility Description and Location
Section 4 Proposed Facility Design
Section 5.3 Geologic Hazards and Resources
Appendices

1. Appendix C Foundations and Civil Engineering Design Criteria
2. Appendix D Structural Engineering Design Criteria
3. Appendix E Mechanical Engineering Design Criteria
4. Appendix F Electrical Engineering Design Criteria
5. Appendix G Control Systems Engineering Design Criteria
6. Appendix H Chemical Engineering Design Criteria

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendix C for a list of the applicable industry standards),

design practices, and construction methods in preparing and developing the site. The applicant's proposed methods follow industry standard practices. Staff concludes that the project, including its linear facilities, is likely to comply with the applicable site preparation LORS, and proposes conditions of certification (below) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace; or that require a long lead time to repair or replace; or those used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment are listed in the conditions of certification (below).

The AFC contains a list of the civil, structural, mechanical and electrical design criteria which demonstrate the likelihood of compliance with applicable LORS, and which staff believes are essential to ensuring that the project is designed in a manner which protects the environment and/or public health and safety.

PROPOSED MODIFICATIONS

The AFC (PDEF 1998a, Appendices C and D) identifies applicable LORS, which include the 1995 CBC. Actual design and construction of the project could begin immediately after certification, or could be delayed for a period of time thereafter.

The project should be designed and constructed to the latest edition of the CBC (and other applicable codes and standards) in effect at the time design and construction of the project actually commence. The 1998 edition of the CBC should be available before this document goes to publication and it is expected that the PDEF will be designed to the 1998 CBC. In the event the design of the PDEF is submitted to the Chief Building Official (CBO)[1] for review when the successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions.

The natural gas pipeline will pass through a residential neighborhood in Antioch on the way to its interconnection point with the existing PG&E gas line (designated by Route 6, segment W-X on Map 3.2-1 of the Application for Certification (PDEF 1998a, AFC, Map 3.2-1)). While the gas line will utilize an existing utility corridor through this area, the proximity to many residences[2] makes it advisable to pay special attention to adherence to all applicable LORS. These LORS include:

- Federal Department of Transportation (DOT) regulations, including Title 49, Code of Federal Regulations, Part 191 (which prescribes requirements for reporting

[1]CBO is the City or County Chief Building Official, his or her representative or the California Energy Commission's duly appointed representative.

[2] This location is designated under Title 49 C.F.R. Part 192 as a Class 3 installation, requiring the most stringent safety measures in construction of the pipeline.

incidents, safety-related conditions, and annual pipeline summary data) and Part 192 (which prescribes minimum safety requirements for pipeline facilities).

- California Health and Safety Code (H&SC) section 13107.5 (which requires the State Fire Marshal to investigate explosions and fires relating to pipelines) and H&SC section 25504 (which requires the pipeline operator to prepare a Business Plan, including an emergency response plan).
- California Public Utilities Commission (CPUC) General Order 112-E (GO 112-E) (which establishes rules governing the design, construction, testing, maintenance and operation of gas pipeline systems).

The proposed utility corridor through which the gas pipeline will pass is already occupied by a 16-inch diameter gas line and a large diameter water line, among others. Staff deems it advisable to ensure that the applicant takes special care in excavating for and installing its gas pipeline, both to ensure that the existing lines are not damaged, and to preclude damage to the new line during maintenance, repair or installation of other lines in the corridor. One possible measure would be to bury the pipeline deeper (eg., with five feet of cover, approximately a foot deeper than proposed in the Application for Certification). This would put it out of the way of any likely damage. A condition of certification is proposed (see below) to ensure that this work is performed properly.

Staff can conclude that the PDEF will, in fact, be designed and constructed to the applicable facility design LORS. In order to provide assurance that this will occur as intended, staff proposes a condition of certification **(GEN 1**, below) to monitor compliance.

Code Design Criteria

The procedures and limitations for the design of structures by the 1998 CBC are determined considering zoning, site characteristics, occupancy, structural configuration, structural system and height. Two of the major parameters in the selection of design criteria are occupancy and structural configuration.

Four categories of occupancy are defined in Table 16-K of the 1998 CBC: Essential, Hazardous, Special and Standard. The CBC defines two categories of structural irregularities in Tables 16-L (Vertical Structural Irregularities) and 16-M (Plan Structural Irregularities). Regular structures are defined as having no significant physical discontinuities in plan or vertical configuration or in their lateral force-resisting systems such as those identified for irregular structures.

Two different design and analysis procedures are recognized in the 1998 CBC for determining seismic effects on structures. Dynamic Analysis Procedures of Section 1631 is always acceptable for design. The Static Force Procedure of Section 1630 is allowed only under certain conditions of regularity, occupancy and height.

Static Analysis

In seismic Zones 3 and 4, the static lateral force procedure of Section 1630 may be used for the following:

- Regular structures under 240 feet in height with lateral force resistance provided by systems listed in Table 16-N, except where Section 1629.8.4, Item 4, applies. (Structures, regular or irregular, located on Soil Profile Type S_F, that have a period greater 0.7 second require dynamic analysis.)
- Irregular structures not more than five stories or 65 feet in height.

Dynamic Analysis

In seismic zones 3 and 4, the dynamic lateral-force procedure of Section 1631 shall be used for all other structures, including the following:

- Structures having a stiffness, weight or geometric vertical irregularity of Type 1, 2 or 3, as defined in Table 16-L, or structures having irregular features not described in Table 16-L or 16-M, except as permitted by Section 1630.4.2 (Where a combination of structural systems is included in the same structure, the structure can be analyzed as two independent structures for purposes of determining regularity.)
- Structures over five stories or 65 feet, not having the same structural system throughout their height except as permitted by Section 1631.2. (An elastic design response spectrum constructed in accordance with Figure 16-3 of the 1998 CBC, using the values of C_a and C_v consistent with the specific site can be used.)
- Structures, regular or irregular, located on Soil Profile Type S_F, that have a period greater than 0.7 seconds.

Structures Requiring Dynamic Analysis

Because of structural irregularity, the following major structures, equipment and components shall be subjected to dynamic analysis requirements of Section 631 of the 1998 CBC: Combustion turbine generator (CTG) pedestal and foundation, steam turbine generator (STG) pedestal and foundation, heat recovery steam generator (HRSG) structure and foundation, exhaust stack and foundation, and cooling tower. Other structures and components may also be candidates for dynamic analysis; see the list of major structures and equipment included in Proposed Condition of Certification **GEN-2** below.

In order to ensure that those structures, components and pieces of equipment requiring dynamic analysis to comply with the code actually receive this treatment, staff proposes that the applicant and staff agree to a list of such items before design progresses. This requirement is incorporated in **Proposed Condition of Certification STRUC-1** below.

MECHANICAL SYSTEMS

Mechanical features of the project include two gas turbine generators burning natural gas, with dry-low NO_X combustors used to control NO_X; two heat recovery steam generators equipped with duct burners, burning natural gas; either one or two steam turbine generators and condensers; a cooling water system; a wet cooling tower; turbine inlet air cooling system (optional); a natural gas-fired auxiliary boiler to augment power output; water and waste water treatment equipment; pressure vessels, piping systems and pumps; aqueous ammonia storage, handling and

piping system; air compressors; fire protection systems; and heating, ventilation, air conditioning (HVAC), portable water, plumbing and sanitary sewage systems.

MECHANICAL LORS AND DESIGN CRITERIA

The application (PDEF 1998a, Appendix E) lists and describes the mechanical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's mechanical systems are designed to the appropriate codes and standards. Staff has proposed conditions of certification (**MECH-1** through **MECH-4**, below) to monitor compliance with this requirement.

ELECTRICAL SYSTEMS

Major electrical features of the project include the generators, 115-kV switchyard, 115 kV transmission lines, power control wiring, protective relaying, grounding system, cathodic protection system and site lighting.

- 115 kV Switchyard. A new 115 kV switchyard will be constructed at the project site. The circuit breakers will be arranged in a breaker and a half bus scheme. The switchyard will be constructed to contain the electrical equipment required to provide 115 kV power to USS-POSCO Industries substation. The breaker and a half arrangement provides high reliability so that in case of a fault, only the faulted circuit is lost with the rest of the plant remaining unaffected.

  - 115 kV Transmission Facilities. A double circuit, 115 kV transmission line will be constructed to interconnect to the existing PG&E Pittsburg Power Plant Sub-station and a single circuit, 115 kV line to the existing USS-POSCO substations. Additional alternate lines (PDEF 1998a, AFC Map 3.2-1, and Routes 1, 2, and segment 10A) are also proposed.

  - Power and Control Wiring. In general, conductors will be insulated on the basis of a normal maximum conductor temperature of 90ºC in 40ºC ambient air with a maximum emergency overload temperature of 130ºC and a short circuit temperature of 250ºC. In areas with higher ambient temperatures, larger conductors will be used or higher temperature rated insulation will be selected.

  - Protective Relaying. These relays protect equipment in the auxiliary power supply system, generator terminal systems, 230 kV system, 66 kV systems, turbine-generator system, and the electrical loads powered from these systems. The protective relaying scheme will be designed to remove or alarm any of the abnormal occurrences.

  - Classification of Hazardous Areas. Areas where flammable and combustible liquids, gases, and dusts are handled and stored will be classified for determining the minimum criteria for design and installation of electrical equipment to minimize the possibility of ignition. The criteria for determining the

appropriate classification are specified in Article 500 of the National Electrical Code (NFPA/ANSI C1).

- Grounding. The station grounding system will be an interconnected network of bare copper conductors and copper clad ground rods. The system will be provided to protect plant personnel and equipment from hazard, which can occur during power system faults and lightning strikes. The station-grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentrations.

- Site Lighting. The site lighting system will provide personnel with illumination for the performance of general yard tasks, safety, and plant security. Power used to supply outdoor roadway and area lighting, will be 208 or 480 volts.

- Freeze Protection. A freeze protection system will be provided for selected outdoor piping as required. Parallel circuit type heating cable will be utilized where possible.

- Cathodic Protection System. Cathodic protection and other corrosion control measures for all plant structures, including the exterior surface of underground piping and bottoms of surface mounted steel tanks will be provided.

The AFC (PDEF 1998a, Appendix F) lists and describes the electrical codes, standards and design criteria that will be employed in project design documents, procurement specifications and contracts. Design work will be performed in accordance with the appropriate LORS. This list indicates that the applicant is aware of the codes, standards, and design criteria appropriate for such a project. This approach will likely assure the project's electrical systems are designed to the appropriate codes and standards.
Staff concludes that the applicant can design the electrical systems in accordance with all LORS and in a manner which protects the environment and public health and safety by complying with the applicable LORS and electrical design criteria (PDEF 1998a, Appendix F). Staff has proposed conditions of certification (**ELEC-1** and **ELEC-2**, below) to monitor this compliance.

ANCILLARY FACILITIES

TRANSMISSION LINE FACILITIES

The proposed 115 kV transmission line (PDEF 1998a, AFC Map 3.2-1, Route 10) is a combination of overhead and underground line. The overhead line will travel from the plant's switchyard to 8th and Harbor Street. The line will go underground and travel west, approximately one mile, in the 8th Street median, and resurface, just north of the 8th Street-Beacon Street intersection. At this point, the line will either travel north (Route 10) or travel further west then north (Route 10a) to connect to the existing 115 kV switchyard at the Pittsburg Power Plant. Other lines (PDEF 1998a, AFC Map 3.2-1, and Routes 1, 2, and 11) are also proposed or given as alternatives.

PIPELINES

Portable/Fire Water Supply: The portable water supply pipeline is a 10-inch diameter pipeline and will interconnect to an existing 10-inch diameter city water main located on East 3rd Street. This line will be approximately 500 feet long.

Natural Gas Supply: The natural gas supply pipeline (PDEF 1998a, AFC Map 3.2-1, Route 6) is sized to permit operation of both combustion turbine generator (CTG) trains and duct burners at full power. The line is 10 inches in diameter and approximately 3.6 miles long. The pipeline will be buried in a trench approximately two feet wide and five feet deep. As discussed above, staff suggests extra care be taken in installation of the line as it passes through a residential neighborhood in Antioch. See Proposed Condition of Certification **MECH-5** below.

Reclaimed Water Supply and Waste Water Return Lines: A new 16-inch diameter reclaimed water supply line and an 8-inch diameter waste water return line will be installed by PDEF to provide the project with tertiary treated reclaimed water. The reclaimed wastewater will be supplied from the Delta Diablo Wastewater Treatment Facility (DDWTF). Route 4 is the proposed; and Route 5 is the alternate reclaimed water supply and waste water return lines (PDEF 1998a, AFC Map 3.2-1). The wastewater from the project will be returned to DDWTF.

Steam Distribution: A new 16-inch diameter, above ground steam line will be constructed to provide USS-POSCO Industries with steam for on going plant operations. The aboveground line will be approximately 0.6 miles long and will connect to USS-POSCO's Boiler Plant #2.

Stormwater Drainage: The stormwater drainage system will convey stormwater runoff to two existing 18-inch diameter lines, which feed into an existing 24-inch diameter stormwater line. The main stormwater line will terminate at the New York Slough (PDEF 1998a, AFC Map 3.2-1, Route 8).

TRUCK BYPASS

A 0.75-mile long, Truck Bypass Road (new 2-lane highway segment) will extend from Pittsburgh-Antioch Highway to Harbor Street. The bypass road will incorporate a sound wall and will improve site access and mitigate project-related and existing area traffic (PDEF 1998a, AFC Map 3.2-1, Route 9).

GEOLOGIC HAZARDS AND RESOURCES

Staff assessed the proposed project with respect to geological hazards and resources and evaluated the applicant's AFC geologic hazards and resources discussions (PDEF 1998a, AFC § 5.3.1) of the power plant site and linear corridors for ancillary facilities. Geologic phenomena that staff assessed for the project area include seismically induced strong ground shaking, ground rupture due to surface faulting, liquefaction, differential settlement, hydrocompaction, landsliding, expansive soils, and design limitations due to subsurface mineral deposits. The principal geologic hazards at the site are seismically induced strong ground shaking

and liquefaction. Staff's analysis of geological resources at the proposed project follows the discussion of geological hazards.

Seismically Induced Strong Ground Shaking

The power plant site and ancillary facility corridors are located in UBC Zone 4, the highest level of potential strong ground shaking[3] in California as indicated on Figure 16-2 of the CBC. The power plant foot print and portions of the linear elements of the project are within 10 kilometers of the "Active Fault Near-Source Zone" of the Greenville Fault (Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada, 1998). However, the design earthquake for the project is not associated with the Greenville Fault. The peak horizontal ground acceleration for the power plant is based upon a M_w 6.7 earthquake occurring on the Pittsburg-Kirby Hills Fault, which is located approximately 2 kilometers north of the proposed power plant foot print. The peak horizontal ground acceleration estimated for the power plant foot print is 0.49g. (PDEF 1998a, AFC § 5.3.1, table 5.3.5). To mitigate the seismic shaking potential, project facilities will be designed to the Zone 4 requirements for facilities within 10 kilometers of a near-source zone, or greater.

Surface Faulting

The nearest zoned active fault with surface rupture potential is the Concord-Green Valley fault located 15 kilometers west of the site (Fault Activity Map Of California and Adjacent Areas, 1994). However, the Pittsburg-Kirby Hills Fault is located approximately 2 kilometers north of the power plant footprint. The Pittsburg-Kirby Hills fault has not been designated an active fault by the California Division of Mines and Geology. Pittsburg (PDEF 1998a, AFC § 5.3.1) has indicated that the Pittsburg-Kirby Hills Fault may be associated with the May 19, 1889, Antioch earthquake. Based upon staff's site observations and check of geological references, staff have concluded that no known active or potentially active faults cross either the plant area or any of the linear facility corridors, therefore the potential for ground surface rupture due to faulting is low.

Liquefaction

Liquefaction of soils is a condition in which seismic shaking of relatively loose, cohesionless soils with the water table less than about 50 feet from the surface can result in loss of shear strength and near-surface ground failure with subsequent loss of foundation bearing strength and/or differential settlement. The project is located on alluvium that is locally overlain by fill. The existing ground surface at the site is at an elevation of 6 to 6.5 feet above sea level. The groundwater level in borings at the adjacent parcel range from 7 to 15 feet below the surface with additional variations due to tidal action in New York Slough expected. At the project area, relatively loose cohesionless soils may exist in localized areas within 50 feet of the surface, making those areas subject to liquefaction. Section 3309.7 of the 1998 edition of the CBC states that the chief building official may require a geotechnical study to be done that amongst other aspects addresses the potential for liquefaction for a site if there

[3] Staff have defined strong ground shaking to mean acceleration of soil, rock, and/or structures that have had or may have a ground acceleration of 0.05g or greater as a result of propagation of a seismic wave through them during or after an earthquake.

is ground water less than 50 feet below natural grade, there is unconsolidated sandy alluvium on site, and the site is located in either seismic zone 3 or 4. Prior to foundation design, a geotechnical study will identify areas in the project that may be subject to liquefaction.

Differential Settlement

Pittsburg has proposed to leave the artificial fill currently in the power plant footprint and construction laydown area. Since the fill is heterogeneous and has not been properly engineered, the potential for static or dynamic differential settlement of portions of the proposed fill prism upon which the power plant will be built can not be ignored. The 1998 edition of the CBC Section 3313.2 requires that deleterious (non-complying or unsuitable) materials be removed from an area to receive fill. It is the understanding of staff that the artificial fill will be processed under the specifications to be developed for the project. Marginal fill (fill that cannot be used in the power plant foot print but still can be disposed of at the site) will be feathered into the construction laydown area and capped with one foot of soil. Mitigation, such as driven pile foundations, may be used to carry foundation loads or for those structures where differential settlement is not tolerated. Differential settlement and fill quality control and quality assurance are addressed in the proposed conditions of certification.

Hydrocompaction

Hydrocompaction is the process by which certain earth materials decrease in volume upon the addition of water. Soils at the power plant site and along the corridors of ancillary facilities are expected to be similar to those encountered in the test borings adjacent to the power plant site. These soils are generally dense and are not considered susceptible to hydrocompaction.

Landsliding

The project area including the linear facilities is generally flat, so landsliding potential is nil.

Expansive Soils

Expansive soils, typically those containing montmorillonite or other similar high plasticity clays, exhibit shrinking and swelling characteristics with wetting and drying of those soils. The expansion and shrinking can cause ground movements beneath foundations. Geotechnical studies will be conducted prior to foundation design of facility foundations to identify any areas where these potentially expansive soils exist. Mitigation, such as removal of the soils, use of pile foundations, or rearrangement of foundations to avoid the potentially expansive soils will be included in final foundation designs.

Mineral Resources

Mineral resources occurring within the region include sand and gravel, natural gas, coal and crushed stone. All of these resources have been exploited in the region, but not at the project site, in the past. There are no known deposits of sand, gravel, coal or natural gas at the power plant site. Should commercial quantities be

discovered beneath the site, exploitation of natural gas deposits would not be hindered by the proposed project.

PROJECT QUALITY PROCEDURES

The AFC describes a Project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with the technical codes and standards appropriate for a powerplant (PDEF 1998a, §3.9.7). Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will likely ensure that the project is designed, procured, fabricated and installed in accordance with LORS.

COMPLIANCE MONITORING

Staff has developed conditions of certification (see section below titled "Proposed Conditions of Certification") to ensure that the design measures and LORS requirements are carried out in a manner that results in the protection of the environment and of public health and safety. Some of these facility design conditions address the roles, responsibilities and qualifications of engineers responsible for the design and construction of the project (proposed conditions of certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction proceeds without approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

FACILITY CLOSURE

PERMANENT CLOSURE

The removal of the facility from service, or decommissioning, may range from “mothballing” to removal of all equipment and appurtenant facilities, depending on conditions at the time. Future conditions that may affect the decommissioning decision are largely unknown at this time. The applicant should provide the details of a permanent closure plan to Contra Costa County, the City of Pittsburg and the Energy Commission in the future, when the appropriate information will be available and the timing for the decommissioning will be more certain. Staff has proposed a condition of certification (**GEN-9**) to ensure compliance.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health, the applicant shall submit a decommissioning plan to the Energy Commission, Contra Costa County and the City of Pittsburg for review and approval prior to commencement of the decommissioning. The plan shall include the following:

- Discussion of the proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project.

- Discussion of all applicable LORS and all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans.

- Discussion of the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities.

- A discussion of decommissioning alternatives, other than complete restoration.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

- The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents, and included herein, are those applicable to the project.

- Staff has evaluated the AFC, and the project LORS and design criteria in the record. Staff concludes that the design and construction of the project can comply with applicable LORS. If properly implemented, design criteria, including staff proposed modifications, will ensure that LORS are met during the project design and construction.

- The conditions of certification proposed below will ensure that the proposed facilities are designed, constructed and operated in accordance with applicable LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the local CBO or other Energy Commission delegate agent. Staff will audit the CBO or delegate agent to ensure satisfactory performance.

RECOMMENDATIONS

If the Energy Commission certifies the project, staff recommends that:

- the project be designed and built to the most recently adopted edition of all applicable LORS in effect at the time that project final design and procurement commences, including the latest edition of the CBC[4] or its successor standard;

- the conditions of certification proposed herein be adopted to ensure that the project is designed and constructed to protect environmental quality, assure public health and safety, and comply with applicable LORS; and

[4] 1998 CBC or later. Conditions of certification presented herein are based on the 1998 CBC, including references to specific sections, tables and coefficients. If the project is designed and built to a successor standard, the 1998 CBC specific references may need to be modified to the successor standard.

- the CBO review the final designs, conduct plan checking and perform field inspections during construction; and staff audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the California Building Code (CBC)[5] and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission, and published at least 180 days previously.

In the event that the PDEF is designed to a successor edition to the 1998 CBC, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met for facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy.]

GEN-2 The project owner shall furnish to the Energy Commission CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment below). To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Major Structures

Combustion Turbine Generator (CTG) Pedestal and Foundation
Steam Turbine Generator (STG) Pedestal and Foundation
CTG Enclosure Structure

[5]All the Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to Sections, Chapters, Appendices and Tables of the 1998 California Building Code (CBC).

STG Enclosure Structure
Air Inlet Filtration with Evaporative Cooler Structure (as applicable)
Cooling Tower
Heat Recovery Steam Generator (HRSG) Structure and Foundation
Exhaust Stack and Foundation
Field-Fabricated Tanks and Foundations
Shop-Fabricated Tanks and Foundations
Condenser Support Structure and Foundations
Equipment Foundations (compressors, pumps, transformers)
Switchyard
Control/Administration Building
Pipe Rack Structures
Transformer Dead End Structure

Major Equipment

CTG
STG
Fired HRSG
Shop-Fabricated Pressure Vessels
STG Condenser
Main Step-up Transformers
Boiler Feed Pumps
Condensate Pumps
Switchgear
Cycle Waste Chemical Storage

At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection, equivalent to the fees listed in the 1998 CBC, Chapter 1, Section 107 and Table 1-A – Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A – Grading Plan Review Fees; and Table A-33-B – Grading Permit Fees. If Contra Costa County or the City of Pittsburg has adjusted the CBC fees for design review, plan check and construction inspection, the project owner shall pay the adjusted fees.

The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fee has been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a

resident engineer (RE), to be in general responsible charge of the project. [Building Standards Administrative Code (Cal. Code of Regs., Tit. 24, § 4-209 – Designation of Responsibilities).]

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

1. monitor construction progress to ensure compliance with LORS;

2. ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these conditions of certification, approved plans, and specifications;

3. prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;

4. be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

5. be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and

6. be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The

project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer who is either a structural engineer or a civil engineer who is fully competent and proficient in the design of power plant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code Section 6704 et seq., and Section 6730 and 6736. Requires state registration to practice as a civil engineer or structural engineer in California.]

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g. proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. [1998 CBC, Section 104.2 – Powers and Duties of Building Official.]

If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A: The civil engineer shall:

1. design (or be responsible for design), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and

2. provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B: The geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering:

1. review all the engineering geology reports, and prepare final soils grading report;

2. prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;

3. be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, Section 3317 – Grading Inspections;

4. recommend field changes to the civil engineer and RE;

5. review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and

6. prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18, Section 1804 – Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations. [1998 CBC, Section 104.2.4 – Stop orders.]

C: The design engineer shall:

1. be directly responsible for the design of the proposed structures and equipment supports;

2. provide consultation to the RE during design and construction of the project;

3. monitor construction progress to ensure compliance with LORS;

4. evaluate and recommend necessary changes in design; and

5. prepare and sign all major building plans, specifications and calculations.

D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

E: The electrical engineer shall:

1. be responsible for the electrical design of the project; and

2. sign and stamp electrical design drawings, plans, specifications, and calculations.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701 – Special Inspections and Section – 1701.5 Type of Work (requiring special inspection), Section 106.3.5 – Inspection and observation program.

The special inspector shall:

1. be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. observe the work assigned for conformance with the approved design drawings and specifications;

3. furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM; and,

4. submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector [certified 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).

At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 The project owner shall keep the CBO informed regarding the status of construction. If any discrepancy between design and construction is discovered during construction, the project owner shall prepare and submit a non-conformance report (NCR) describing the nature of the discrepancy to the CBO. The NCRs shall reference this condition of certification, and applicable sections of the applicable edition of the CBC.

The project owner shall submit monthly construction progress reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings. [1998 CBC, Section 108 – Inspections.]

Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.

GEN-9 The project owner shall file a closure/decommissioning plan with the City of Pittsburg, Contra Costa County and the CPM for review and approval at least 12 months (or other mutually agreed to time) prior to commencing the closure activities. If the project is abandoned before construction is completed, the project owner shall return the site to its original condition.

The closure plan shall include a discussion of the following:

1. the proposed closure/decommissioning activities for the project and all appurtenant facilities constructed as part of the project;

2. all applicable LORS, all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;

3. activities necessary to restore the site if the decommissioning plan requires removal of all equipment and appurtenant facilities; and

4. closure/decommissioning alternatives, other than complete restoration of the site.

At least 12 months prior to closure or decommissioning activities, the project owner shall file a copy of the closure/decommissioning plan with the City of Pittsburg, Contra Costa County and the CPM for review and approval. Prior to the submittal of the closure plan, a meeting shall be held between the project owner and the CPM for discussing the specific contents of the plan.

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the CPM (the functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license).

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit to the CBO for approval, the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CBO approval is needed. The CBO will approve or disapprove of the engineering geologist(s) and will notify the project owner and CPM of its findings within 15 days of receipt of the submittal.

If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual to the CBO and CPM. The CBO will approve or disapprove of the engineering geologist(s) and will notify the project owner and the CPM of the findings within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned engineering geologist shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 – Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

1. Prepare the Engineering Geology Report. This report shall accompany the plans and specifications when applying to the CBO for the grading permit.

2. Monitor geologic conditions during construction.

3. Prepare the Final Geologic Report.

The Engineering Geology Report required by the 1998 CBC, Appendix Chapter 33, Section 3309.3 Grading Designation, and shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy, for the intended use, of the site as affected by geologic factors.

The Final Geologic Report to be completed after completion of grading, as required by the 1998 CBC, Appendix Chapter 33, Section 3318.1, and shall contain final description of the geology of the site and any new information disclosed during the grading, and the effect of same on recommendations incorporated in the approved grading plan. Engineering geologists shall submit a statement that, to the best of their knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of the 1998 CBC, Appendix Chapter 33, Section 3318.1.

(1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Geologic Report required by the 1998 CBC, Appendix Chapter 33, Section 3318 Completion of Work, to the CPM and the CBO.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. design of the proposed drainage structures and the grading plan;
2. an erosion and sedimentation control plan;
3. related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report and Section 3309.6 – Engineering Geology Report.

At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [1998 CBC, Section 104.2.4 – Stop orders.]

The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC, Section 108 – Inspections, Chapter 17, Section 1701.6 – Continuous and periodic special inspection and Appendix Chapter 33, Section 3317 – Grading inspection. All plant site-grading operations shall be subject to inspection by the CBO and the CPM.

If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM an NCR, and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs for the reporting month shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities. [1998 CBC, Section 109 – Certificate of Occupancy.]

Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

CIVIL-5 Deleterious and/or contaminated materials and soils are to be mitigated in a manner acceptable to the CBO.

The project grading plans and specifications are to include steps to assure the stability of the foundation of the power plant with respect to differential settlement.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM in the next Monthly Compliance Report a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the applicable designs, plans and drawings, and a list of those project structures, components and major equipment items that will undergo dynamic structural analysis. Designs, plans and drawings shall be those for:

1. major project structures;
2. major foundations, equipment supports and anchorage;

3. large field fabricated tanks;
4. turbine/generator pedestal; and
5. switchyard structures.

The project owner shall:

1. obtain agreement with the CBO on the list of those structures, components and major equipment items to undergo dynamic structural analysis;

2. meet the pile design requirements of the 1998 CBC. Specifically, Section 1807 – General Requirements, Section 1808 – Specific Pile Requirements, and Section 1809 – Foundation Construction (in seismic zones 3 and 4);

3. obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications, [1998 CBC, Section 108.4 – Approval Required];

4. submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation, [1998 CBC, Section 106.4.2 – Retention of plans and Section 106.3.2 – Submittal documents.]; and

5. ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer. [1998 CBC, Section 106.3.4 – Architect or engineer of record.]

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following:

1. concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

2. concrete pour sign-off sheets;

3. bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

4. field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number [ref: AWS]; and

5. reports covering other structure activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701 – Special Inspections, Section 1701.5 – Type of Work (requiring special inspection), Section 1702 – Structural Observation and Section 1703 – Nondestructive Testing.

If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2 – Submittal documents, and Section 106.3.3 – Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC. Chapter 16, Table 16–K of the 1998 CBC requires use of the following seismic design criteria: $I = 1.25$, $I_p=1.5$ and $I_w=1.15$.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude: domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter equal to or less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction. [1998 CBC, Section 106.3.2 – Submittal documents, Section 108.3 – Inspection Requests.]

The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when:

1. the proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and

2. all of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:

   - American National Standards Institute (ANSI) B31.1 (Power Piping Code);
   - ANSI B31.2 (Fuel Gas Piping Code);
   - ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
   - ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
   - Specific City/County code.

The CBO may require the project owner, as necessary, to employ special inspectors to report directly to the CBO to monitor shop fabrication or equipment installation. [1998 CBC, Section 104.2.2 – Deputies.]

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the proposed final design plans, specifications, calculations and quality control procedures for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation. [1998 CBC, Section 108.3 – Inspection Requests.]

The project owner shall:

1. ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler

and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and

2. have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of the CBO plan check approvals to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's and/or Cal-OSHA inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS. [1998 CBC, Section 108.7 Other Inspections; Section 106.3.4 – Architect or engineer of record.]

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of CBO comments and approvals to the CPM in the next Monthly Compliance Report. The project owner shall transmit a copy of the CBO's

inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction. [1998 CBC, Section 108.3 – Inspection Requests, Section 108.4 – Approval Required.]

The project owner shall design, fabricate and install:

1. plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and

2. building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2.

The final plans, specifications and calculations shall clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission’s Decision.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

MECH-5 Prior to construction of the natural gas pipeline, the project owner shall provide a plan to the CPM, for approval, detailing the measures that will be taken, above and beyond adherence to the applicable LORS, to ensure safety during installation and operation of the pipeline, particularly that portion passing near residences. The plan shall address any design features, such as increased depth, a protective cap, and special construction techniques that will be incorporated in installation of the pipeline.

The LORS applicable to the natural gas pipeline include the following:

- Title 49 Code of Federal Regulations, Parts 191 and 192
- California Health and Safety Code Sections 13107.5 and 25504
- California Public Utilities Commission General Order 112-E

At least thirty days prior to the beginning of construction of the natural gas pipeline, the project owner shall provide to the CPM the plan described herein for approval. Any actual construction deviations from this plan shall be reported and dealt with per the requirements of Condition of Certification **GEN-7** above.

ELEC-1 For the 13.8 kV and lower systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. [1998 CBC, Section 108.4 – Approval Required, and Section 108.3 – Inspection Requests.]

The following activities shall be reported in the Monthly Compliance Report:

1. receipt or delay of major electrical equipment;
2. testing or energization of major electrical equipment; and
3. the number of electrical drawings approved, submitted for approval, and still to be submitted.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

ELEC-2 The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C: [CBC 1998, Section 106.3.2 – Submittal documents.]

A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems;
2. system grounding drawings;
3. general arrangement or conduit drawings; and
4. other plans as required by the CBO.

B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. other reasonable calculations as customarily required by the CBO.

C. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Commission Decision.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for the items enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

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California Department of Conservation, Division of Mines and Geology, Published by International Conference of Building Officials, Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada [to be used with the 1997 Uniform Building Code], Publication date listed in error as February, 1988. Actual publication date is February 1998.

Jennings, C.W., Fault Activity Map of California and Adjacent Areas, California Department of Conservation, Division of Mines and Geology, 1994.

POWER PLANT RELIABILITY

Testimony of Steve Baker

INTRODUCTION

In this analysis, staff addresses the reliability issues of the PDEF to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Such a level of reliability is selected as a benchmark because the resulting project would likely not degrade the overall reliability of the electric system it serves, and because no special reliability requirements pertain to the project.

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 PDEF design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While the applicant has predicted a level of reliability for the power plant (see below), staff believes the applicant should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the Energy Commission must make findings as to the manner in which the PDEF is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system.

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin." This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven- to ten-percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.
Now, in the newly restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System

Operator (Cal-ISO), a newly-formed entity that will work with the California Power Exchange to purchase, dispatch and sell electric power throughout the state. How Cal-ISO will ensure system reliability is not yet thoroughly understood; protocols are now being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. “Must-run” power purchase agreements and “participating generator” agreements are two mechanisms currently being considered to ensure an adequate supply of reliable power (Mavis 1998).

These mechanisms apparently are being devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures will act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by the Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry have become accustomed.

The applicant proposes to operate the PDEF to provide up to 60 MW of electricity plus cogeneration steam to the USS-POSCO steel mill, to satisfy any bilateral contracts that it may be able to sign with other electricity users, and to sell power on the spot market through the Cal-ISO (PDEF 1998a, AFC §§ 1.1, 3.1). The applicant speaks of no plans to sell reliability-related power services, such as voltage support or spinning reserve. In the new competitive electric power industry, if such service were desired, the market would put a price on that service. If the price were high enough, the applicant or others would move to serve the need. Since the PDEF does not profess to provide voltage support, spinning reserve or other reliability-related services, staff proposes to place no special reliability requirements on it.

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Achieving this reliability is accomplished by ensuring equipment availability, plant maintainability, fuel and water availability, and adequate resistance to natural hazards.

Throughout its intended life, the PDEF will be expected to perform reliably in baseload and load following duty. Such plants are expected to provide uninterrupted service for very long durations. Baseload power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. This requirement for equipment availability is typically addressed by control of quality in machinery design, construction, and installation. Plant reliability is further assured by providing for

plant maintainability and sufficient redundancy of critical equipment, fuel and water availability, and resistance to natural hazards.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant; by procuring equipment from qualified vendors and suppliers; and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

QA/QC Program

The QA/QC program delineated by the applicant (PDEF 1998a, AFC §§ 3.9.6, 3.9.7) describes a program typical of the power industry. Project designs and procurement specifications will be checked by qualified reviewers, equipment and supplies will be purchased from qualified suppliers and will be inspected upon receipt, and construction and installation will be inspected and systems tested, all in accordance with the QA plan. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

Qualified Vendors and Suppliers

Vendors of plant equipment and materials will be selected from lists of qualified suppliers, those with known capabilities. To appear on the list of qualified suppliers, a vendor must show satisfactory past performance, financial condition, personnel qualifications, past performance capability, and quality assurance programs (PDEF 1998a, AFC § 3.9.7). Procured items will be subjected to an inspection and audit process that ensures the expected quality. This describes an industry standard approach to vendor selection, which staff expects to lead to the acquisition of quality, reliable equipment and materials.

PLANT MAINTAINABILITY

Equipment Redundancy

A generating facility called on to operate in baseload service for long periods of time, such as the PDEF, must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

The applicant plans to provide some redundancy of function (PDEF 1998a, AFC §§ 3.4.8.3, 3.9.3; & 1998u, Table 3.9-1). For example:

> The following plant components are provided in sets of two 100 percent capacity units:

- HRSG feedwater pumps;
- condensate pumps;

- air compressors and dryers;
- fuel gas filter/separators;
- demineralized water pumps; and
- reclaimed water pumps.

The following plant components are provided in sets of three 50 percent capacity units:

- circulating water pumps.
- The computerized control and protective system for the gas turbine generators, steam turbine generator and HRSGs, known as the Distributed Control System (DCS), will exhibit typical redundancy. The DCS will be powered by an uninterruptible power supply (UPS) to ensure plant control under power failure conditions (PDEF 1998a, AFC §§ 3.4.3.1.4, 3.4.8.2).

While some power plants exhibit slightly greater levels of equipment redundancy, the fact that the PDEF consists of two parallel trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). If such a failure occurs, that gas turbine generator and HRSG must be shut down until repairs or replacement can be effected. The remaining gas turbine/HRSG, however, can continue to operate, generating power and providing steam to power the steam turbine. If the steam cycle fails, the auxiliary boiler is available to continue to provide cogeneration steam to the host facility (PDEF 1998a, AFC § 3.4.8.6). With these opportunities for continued operation in the face of equipment failure, staff believes that the equipment redundancy described here represents an adequate design approach for a project such as this.

Maintenance Program

The applicant proposes to establish a plant maintenance program in accordance with documented procedures (PDEF 1998a, AFC § 3.9.3). In conjunction with an overall plant quality control program (PDEF 1998a, AFC § 3.9.6), staff expects that this will allow the PDEF to be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

Fuel (natural gas) will be supplied to the PDEF from PG&E's SP-5 gas line by a 3.6 mile-long, ten-inch diameter gas pipeline (PDEF 1998a, AFC §§ 1.3.4, 3.4.4.1). In light of the PDEF's ready access to the substantial California natural gas market,

staff agrees with the applicant's prediction (PDEF 1998a, AFC § 3.9.4.2) that there will be adequate natural gas supply and pipeline capacity to meet the PDEF's needs.

Water Supply Reliability

Water will be used in the power plant chiefly for steam turbine condenser cooling, and to feed the gas turbine generators' evaporative inlet air coolers, should they be installed. Tertiary treated reclaimed water will be supplied to the PDEF from the Delta Diablo Wastewater Treatment Facility via a 2.3 or 2.6 mile long 16 inch diameter pipeline (PDEF 1998a, AFC §§ 1.3.3, 3.1, 3.4.5.2). Potable water, delivered through a 500 foot long, ten inch diameter pipeline from the City of Pittsburg, will serve as a backup supply (PDEF 1998a, AFC §§ 3.4.5.1, 3.4.5.3). Both sources of water represent substantial, reliable supplies (PDEF 1998a, AFC § 3.9.5; & 1998u, § 5.5.2.1.1). Staff regards this as an adequately reliable supply.

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for the PDEF, but seismic shaking (earthquake) and flooding present real threats to reliable operation (see that portion of this document entitled **Facility Design**).

Seismic Shaking

Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. (Please see that section of this document titled **Facility Design**.) By virtue of being built to the latest seismic design LORS, the PDEF will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

Flooding

The PDEF will be constructed practically adjacent to the San Joaquin River in a 100-year floodplain. The existing site elevation varies from 6 to 6.5 feet above mean sea level; the estimated 100-year flood depth is seven feet. The plant will be built at an elevation of twelve feet above sea level (PDEF 1998k, § 3.3.2); this should be adequate to protect against flooding.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet

(www.nerc.com). NERC reports the following summary generating unit statistics for the years 1992 through 1996 (NERC 1997):

For Simple Cycle Gas Turbine units (over 50 MW)
Availability Factor = 89.76 percent

For Combined Cycle units (of all sizes)
Availability Factor = 90.48 percent

For all Gas Turbine units (of all sizes)
Availability Factor = 90.11 percent

The GE Frame 7FA gas turbines that will be employed in the PDEF have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an availability factor of 92 to 98 percent (PDEF 1998a, AFC §§ 1.3.2, 3.8.1) exceeds somewhat the NERC figure (90.48 percent) for similar plants throughout North America (see above). While this estimate of plant availability may be slightly optimistic, the stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in step with industry norms, and staff believes they are likely to yield an adequately reliable plant.

CONCLUSION

The applicant predicts an equivalent availability factor of 92 to 98 percent, which slightly exceeds the industry norm of 90 percent for this type of plant. While this may be optimistic, based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable peration. This should provide an adequate level of reliability.

REFERENCES

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POWER PLANT EFFICIENCY

Testimony of Steve Baker

INTRODUCTION

PROJECT DESCRIPTION

The applicant proposes to construct and operate a (nominal) 500 MW combined cycle cogeneration power plant. The Pittsburg District Energy Facility (PDEF) will consist of two 170 MW gas turbine generators, two heat recovery steam generators (HRSGs) with duct burners, and either a single 160 MW steam turbine generator or two 80 MW steam turbine generators. The power plant will provide heat energy, in the form of steam turbine low pressure extraction steam, to the USS-POSCO host facility (PDEF 1998a, AFC § 1.3.2) for use in heating process solutions and powering vacuum eductors in the steelmaking process (PDEF 1998b).

PURPOSE OF THE ANALYSIS

The Energy Commission makes findings as to whether energy use by the PDEF will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the PDEF's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

Operating a power plant in compliance with the state definition of a cogeneration facility opens the way to exempting an applicant from the requirement to file a Notice of Intention (NOI). Eliminating this step in the licensing of the facility can shorten the certification process by a year or more. In this analysis, staff examines whether the PDEF qualifies for exemption from the NOI process due to its status as a cogeneration power plant.

SCOPE OF THE ANALYSIS

In order to justify exemption from filing an NOI and to support the Energy Commission's findings, this analysis will:

- determine whether the PDEF meets the state definition of a cogeneration facility;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures or alternatives exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

California Environmental Quality Act

CEQA requires that an environmental analysis be completed prior to determining whether to approve an Application for Certification (AFC) of a power plant. This analysis must include an identification of the significant effects of a project on the environment, feasible mitigation measures, and alternatives to the project (Pub. Resources Code, § 21002.1).

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)). The Guidelines further require consideration of 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, Appendix F).

Warren-Alquist Act

The Warren-Alquist Act requires the submittal to the Energy Commission of an NOI prior to filing an AFC (Pub. Resources Code, § 25502); this NOI process commonly takes twelve months. Exemption from the NOI process is allowed for certain projects, including cogeneration plants (Pub. Resources Code, § 25540.6(a)(1)). Cogeneration, in turn, is defined in terms of efficiency standards (Pub. Resources Code, § 25134).

LOCAL

No local or county ordinances apply to power plant efficiency.

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

Adverse Effects on Energy Supplies and Resources

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The PDEF will burn natural gas fuel at a

maximum rate exceeding 29 trillion Btu per year (PDEF 1998a, AFC Appendix M). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

The applicant has described its sources of supply of natural gas for the PDEF (PDEF 1998a, AFC § 3.9.4). Gas will be purchased on the open market, utilizing long- and short-term contracts, as appropriate. Gas can be supplied from Canada and Texas, as well as from California itself. These sources represent far more gas than would be required for a project of this size. It is therefore highly unlikely that the PDEF could pose a substantial increase in demand for natural gas in California.

Additional Energy Supply Requirements

As the natural gas supply system in California is so large and well-established, there is no real likelihood that the PDEF will require development of any new sources of energy.

Compliance with Energy Standards

No standards apply to the efficiency of the PDEF. Its compliance with the definition of a cogeneration facility is described below.

Project 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 to generate power.

Project Configuration

The PDEF will be configured as a compound-train combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by one or two steam turbines that operate on heat energy recuperated from the gas turbines' exhaust. By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbine(s) operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The PDEF will further be configured as a cogeneration power plant. Cogeneration involves the concurrent generation of electricity and useful thermal energy (heat). By making use of waste heat that would otherwise be lost, a cogeneration power plant is inherently more efficient than the separate power plant and industrial heat source (boiler or heater) that it replaces.
The number of turbines contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back. Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one gas turbine. This allows the plant to generate at less than full load while maintaining optimum efficiency. Loads down to approximately fifty percent of full

load allow one gas turbine, operating at full load, and the steam turbine to maintain peak efficiency.

Equipment Selection

Modern gas turbines, at the leading edge of design and manufacturing progress, embody the most fuel-efficient electric generating technology available today. The F-class gas turbines to be employed in the PDEF represent some of the most modern and efficient such machines available at this time. The applicant will employ a two-gas-turbine, combined cycle power train, the General Electric S207FA (PDEF 1998k, cover letter), nominally rated at 529.9 MW and 56.5 percent efficiency (GTW 1997b).

Electricity will be generated at a peak load efficiency of approximately 51.5 percent;[1] compare this to the average efficiency of a typical utility company baseload power plant at approximately 32 percent. Overall cogeneration project fuel efficiency (electricity plus steam) will be 54.2 percent (PDEF 1998a, AFC Appendix M).

Efficiency of Alternatives to the Project

The project objectives include generation of baseload electricity at an availability factor of 95 percent or greater (PDEF 1998a, AFC §§ 1.3.2, 3.1).

Alternative Generating Technologies

The applicant considers alternative generating technologies in the Application for Certification (PDEF 1998a, AFC § 6.2.2). Oil-burning, coal- and coke-burning, solar, wind, hydroelectric, nuclear and geothermal technologies are all considered. Given the project objectives, location and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft jet engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the

[1] At ISO conditions and lower heating value (LHV). LHV is the convention commonly used by gas turbine manufacturers to measure efficiency; the remainder of industry typically uses higher heating value (HHV). Efficiency figures expressed in LHV are always greater than in HHV.

best available fuel efficiency, but at the same time sells for the lowest per-kilowatt capital cost.

The machine chosen for the PDEF, an F-class gas turbine in combined cycle, represents the current state of the art in fuel efficiency. One possible alternative is the Westinghouse 501G, a machine only recently available.[2] While the 501G promises slightly higher fuel efficiency than the F-class machines, the difference is small (one percentage point). Selecting between the two classes of machine is thus based on other factors, such as generating capacity,[3] cost and commercial availability. While the F-class machines have already amassed a service record in numerous power plants around the world, Westinghouse is only beginning to deliver 501G machines to customers.[4] Given the marginal efficiency improvements promised by the G-class turbine, the applicant's decision to purchase an F-class machine is a reasonable one.

The expected efficiency of the GE S207FA combined cycle, nominally rated at 56.5 percent efficiency,[5] compares favorably to the other two F-class machines currently available:

- the ASEA Brown Boveri KA 24-2, nominally rated at 512 MW and 57.3 percent efficiency at ISO[6] conditions; and
- the Westinghouse 2x1 501F, rated at 537.8 MW and 57.1 percent efficiency (GTW 1997b).

Any differences among the three in actual operating efficiency will be insignificant.

With the gas turbine chosen, selection of an appropriate steam turbine for the combined cycle is straightforward. Any number of manufacturers can tailor a machine precisely to the needs of the gas turbine.
A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase gas turbine power output by cooling the gas turbine inlet air. A chiller can offer greater power output than the evaporative cooler on hot, humid days, while an evaporative cooler promises slightly higher operating efficiency. While the applicant has not yet decided whether to install inlet air cooling

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[2] The first 501G machine, at Mitsubishi Heavy Industries' Takasago Works facility in Japan, began operation on April 7, 1997 (GTW 1997a).

[3] The 501G is available in a single-gas-turbine, single-steam-turbine combined cycle configuration at 345.3 MW, and a double-single configuration at 693.5 MW (GTW 1997b).

[4] Westinghouse recently accepted the first order for a 501G machine from a U.S. customer. The turbine will be sold to the Lakeland, Florida, Department of Electric & Water Utilities (Power 1998). GE had planned to offer a G-class machine, but recently decided not to (Bosworth 1998).

[5] Assuming no energy is given up to a cogeneration process.

[6] International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

(PDEF 1998a, AFC §§ 1.3.2, 3.4.1, 3.4.8.4.6, 3.4.8.4.7), neither method will yield a significant efficiency advantage over the other.

In conclusion, the project configuration (combined cycle cogeneration) and generating equipment (GE F-class gas turbines) chosen appear to represent the most efficient feasible combination to satisfy the project objectives.

EXEMPTION FROM REQUIREMENT TO FILE A NOTICE OF INTENTION

The applicant has projected the facility to operate 95 percent or more of the time (PDEF 1998a, AFC § 1.3.2). The plant is to generate up to 500 MW of electricity while supplying approximately 75,000 pounds per hour of steam at 200 psia[7] to the host facility, the USS-POSCO steel mill. Based upon these assumptions, the applicant has calculated that the plant will achieve an operating standard of five percent and an efficiency standard of 52.8 percent (PDEF 1998a, AFC Appendix M); staff believes these figures are reasonable and achievable. These figures will qualify under the state definition of a cogeneration facility, as they equal or exceed the minimum values of five percent operating standard and 42.5 percent efficiency standard.[8] Under the Warren-Alquist Act (Pub. Resources Code, § 25540.6(a)(1)), this exempts the PDEF from the requirement to file an NOI. Staff has proposed a Condition of Certification (EFF-1 below) to ensure that these standards are achieved in actual operation.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The PDEF, if operated as proposed, would generate 500 MW of electric power at an overall cogeneration project fuel efficiency (electricity plus steam) of 54.2 percent. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. In actual operation, the PDEF may actually displace power that would have been generated by other, less efficient plants serving the utility system. The end result could thus be a beneficial, rather than adverse, impact on energy resources. Staff therefore concludes that the PDEF would present no significant adverse impacts upon energy resources.
The PDEF will likely comply with state cogeneration definition standards. The projected operating standard of five percent would equal the minimum required level, and the projected efficiency standard of 52.8 percent would exceed the minimum required level of 42.5 percent. The PDEF will thus qualify for exemption from the NOI process.

[7] Pounds per square inch, absolute.

[8] These milestones must be achieved on an annual basis. In actual operation, as the year progresses, the plant operator monitors these parameters and makes any required adjustments in plant power generation and steam supply to the host facility in order to ensure compliance.

RECOMMENDATION

To ensure that the PDEF is operated as efficiently as projected, and in accordance with the state definition of a cogeneration project, staff recommends that the Energy Commission adopt the condition of certification proposed herein.

PROPOSED CONDITION OF CERTIFICATION

EFF-1 The facility shall be operated in accordance with the requirements of Public Resources Code Section 25134.

The project owner shall maintain monthly records of: 1) fuel consumption in the gas turbines and HRSG duct burners (including startup and shutdown); 2) net electrical energy produced; and 3) net thermal energy derived from cogeneration steam.

Based upon these records, the project owner shall annually prepare calculations of the operating standard and efficiency standard achieved by the plant, showing how the plant meets the minimum required standards.

Verification: The project owner shall maintain an on-site compliance file that contains the above records and the above calculations showing compliance with the required standards, and make it available for audit by the CPM at any reasonable time. The project owner shall also submit the above calculations of the operating standard and efficiency standard to the CPM in each Annual Compliance Report following the first instance of power generation from the plant.

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TRANSMISSION SYSTEM ENGINEERING

Testimony of Ean O'Neill and Al McCuen

INTRODUCTION

Transmission System Engineering (TSE) analysis is conducted to provide a basis for the findings required in the Energy Commission's decision identified below. This final staff analysis (FSA) provides an indication of whether the transmission facilities associated with the proposed project appropriately conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission.

Pittsburg District Energy Facility (PDEF), Limited Liability Corporation, the applicant, proposes to connect their project to Pacific Gas & Electric Company's (PG&E) transmission system. The California Independent System Operator (Cal-ISO) is responsible for ensuring system reliability and must determine both the standards necessary to achieve reliability and a proposed project's conformity with those standards. The Cal-ISO's authority for ensuring reliability applies to the Cal-ISO controlled grid and any projects that are proposed to interconnect to the grid. The Energy Commission will rely on the Cal-ISO's determinations to make its finding related to conformity with applicable reliability standards, the need for additional transmission facilities, and environmental review of the whole of the project. In this case, staff's primary role is facilitation of the timely coordination of the Cal-ISO's process and results with the certification process and Energy Commission decision. The Cal-ISO will not receive the results from PDEF's Detailed Facilities Study being performed by PG&E until approximately May 1999. As a result, their findings are not available to incorporate into this FSA. The Cal-ISO will provide testimony for the Energy Commission's hearings.

Staff's analysis also evaluates outlet alternatives identified by the applicant and provides recommended conditions of certification to ensure that applicable LORS are complied with during the design, construction and operation of the project. A condition of certification is recommended that ensures the Cal-ISO's approval to interconnect to the Cal-ISO controlled grid will occur prior to construction of the project.

Public Resources Code, section 25523 requires the Energy Commission to "prepare a written decision…which includes:…findings regarding conformity of the proposed site and related facilities…with public safety standards…and with other relevant local, regional, state, and federal standards, ordinances, and laws." Under the California Environmental Quality Act (CEQA) the Energy Commission must conduct an environmental review of the "whole of the project," which may include facilities not licensed by the Energy Commission (Cal. Code Regs., tit. 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to California's transmission system.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), “Rules for Overhead Electric Line Construction” formulates uniform requirements for construction of overhead lines. Compliance with this order will ensure adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC General Order 128 (GO-128), “Rules for Construction of Underground Electric Supply and Communications Systems,” establishes uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.

- Western Systems Coordinating Council (WSCC) Reliability Criteria provide the performance standards used in assessing the reliability of the interconnected system that provides continuity of service to loads as a first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria For Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 “Criteria for Transmission System Contingency Performance” which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (such as loss of load or a single transmission element out of service) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas during major disturbances (such as loss of all lines in a right of way). While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).

- North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC’s Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1997).

- Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are

similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied in assessing the system reliability implications of the PDEF. Also of major importance to the PDEF and other privately funded projects which may sell through the California Power Exchange (Cal-PX) is the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that dispatch not violate system criteria as market participants are requesting generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify the effects on total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine if the participant will be paid more or less than, for instance, the generating units dispatched net power output (ISO 1998e, ISO 1998f).

SETTING

PROJECT DESCRIPTION

The PDEF will be located on an industrial site owned and controlled by USS-POSCO Industries. The location of the site is approximately one mile east-northeast of the center of the city of Pittsburg, California, approximately one mile west of the city of Antioch, California and just south of the New York Slough. The PDEF will provide a nominal electrical output of 500 megawatts (PDEF 1998a, AFC page 3.1-1). The transmission system will consist of a 115 kilovolt (kV) (see **Definition of Terms**) switchyard and a combination of an overhead (approximately one mile) and underground (approximately one mile) double circuit 115 kV transmission line that will connect into the existing Pittsburg Power Plant switchyard. The overhead line will be constructed on steel poles. A second single circuit 115 kV transmission line approximately 1.2 miles long will connect into two existing USS-POSCO substations and provide up to 60 megawatts of power for customer use (PDEF 1998a, AFC pages 3.1-2 & 3.5-5). The line will be constructed on either 130-foot lattice or steel poles (PDEF 1998k, AFC page 5.13-2).

The switchyard will be located on the west side of the project site. The 115 kV overhead transmission line connecting into the existing switchyard at the Pittsburg

Power Plant will exit the PDEF's proposed switchyard and proceed in a southwesterly direction to the east side of Harbor Boulevard at 8th Street. The line then transitions to underground and continues in a westerly direction in the 8th Street median. Just north of 8th and Beacon Streets, the line rises overhead and travels in a northwesterly direction and connects to the existing 115 kV switchyard at the Pittsburg Power Plant (PDEF 1998k, AFC page 3-2 & Map 3.2-1).

EXISTING FACILITIES AND RELATED SYSTEMS

The proposed PDEF site is located near 230 kV, 115 kV and 60 kV transmission lines owned by PG&E. Relevant facilities owned by PG&E in the project area include, but are not limited to the following (PDEF 1998a, AFC page 3.5-1):

115 kV Lines
Brighton – Clayton
Brighton – Contra Costa
Columbia Steel Tap
Pittsburg – Contra Costa
Pittsburg – Martinez
Pittsburg – Clayton

115 kV Substations
Contra Costa
POSCO
Dow Chemical
Columbia Steel

ANALYSIS

INTERCONNECTION FACILITIES

The proposed PDEF transmission facilities will consist of a 115 kV switchyard, a 115 kV double circuit combination overhead/underground transmission line connecting to the Pittsburg Power Plant switchyard. A 115 kV single circuit overhead transmission line will also connect into two USS-POSCO substations to provide service to USS-POSCO (PDEF 1998a, AFC page 3.1-2 and PDEF 1998k, AFC page 3-2).

PROJECT SWITCHYARD

The project switchyard configuration will consist of either eight or nine 115 kV SF6 (see **Definition of Terms**) circuit breakers depending on which configuration is chosen for the combined cycle units. In either configuration there will be two 115 kV transmission lines exiting the project switchyard. A 115 kV double circuit transmission line will connect into the existing Pittsburg Power Plant switchyard and a single circuit 115 kV line will connect to the two USS-POSCO substations (PDEF 1998a, AFC Figure 3.4-1 & 3.4-2). The circuit breakers will be arranged in a breaker and a half arrangement. This type of an arrangement provides greater reliability than most other possible arrangements and allows the plant to provide partial output to the grid even under conditions where the circuit breaker protecting a circuit fails to open when needed (PDEF 1998a, AFC page 3.4-5).

Short circuit analyses are conducted to assure that breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The switchyard components will be rated in accordance with the results of

a short circuit study. A preliminary short circuit study has been provided in PG&E's Preliminary Facilities Study. PG&E will confirm that the fault duties presented in the Preliminary Facilities Study are still accurate in its Detailed Facilities Study[1]. The acceptability of breaker ratings will be determined during the compliance phase. Conditions of certification have been provided to cover this eventuality (TSE-1b).

OUTLET LINE

The PDEF 115 kV transmission line connecting to the existing Pittsburg Power Plant switchyard will be a double circuit line approximately two miles long (Route 10). The overhead and underground sections will each be approximately one mile in length. The overhead section will be constructed with ACSR cable (See **Definition of Terms**) with two conductors per phase that will provide at least 525 megawatts (MW) of transfer capability at 115 kV per circuit (PDEF 1998a, AFC page 3.4-4 and 3.5-5). The overhead line will utilize 150-foot steel tubular poles every 500 to 700 feet. The overhead line will be constructed in accordance with CPUC General Order 95 (PDEF 1998a, AFC page 3.5-5). The right of way width will vary depending on whether the line is overhead or underground. The required right of way for every section of line will be adequate (PDEF 1998k, AFC page 5.13-1 & Map 3.2-1).

The underground portion will be constructed with solid dielectric cable (see **Definition of Terms**). The cables will be installed in two separate trenches approximately 6.6-foot deep by 4-foot wide, with a separation of approximately 15 feet between the trenches (see **TRANSMISSION SYSTEM ENGINEERING Figure 1**). The cables will be arranged horizontally with three conduits on the top and three conduits on the bottom. Each circuit requires six cables with each cable encased in its own conduit. The conduits will be encased in lean concrete, with six inches of reinforced concrete on top and three feet of dirt on top of the concrete (CEC 1998s). The underground trenches will be installed in an existing old railroad 50-foot right of way along the 8th Street median strip.

There will be two transition stations to accommodate the conversion from overhead to underground (see **TRANSMISSION SYSTEM ENGINEERING Figure 2**). The overhead portion will be approximately 30 feet high by 50 feet wide and 90 feet long. The overhead lines will then transition into its respective conduit. There will be two pulling manholes eight feet square by seven feet deep approximately 1600 feet apart (CEC 1998s). The underground line will be constructed in accordance with CPUC General Order 128 (PDEF 1998a, AFC page 4.1-1). The conductor sizes for both the overhead and underground portions of this line will be determined later in the design phase of the project. Staff has proposed a condition of certification to assure the adequacy of the conductor size should it not be determined during the AFC process (TSE-1d).

[1] A Detailed Facilities Study is the final interconnection study that includes all the pertinent information required by the Cal-ISO in order to grant interconnection to the Cal-ISO controlled grid. It also provides the cost to the applicant to interconnect to the grid within plus or minus ten percent.

TRANSMISSION SYSTEM ENGINEERING Figure 1
Sketch of 115 kV Duct Bank and Trench Configuration

TRANSMISSION SYSTEM ENGINEERING Figure 2
Sketch of 115 kV Transition Station Configuration

The 115 kV line going to the two USS-POSCO substations will be approximately 1.2 miles in length (Route 11). The line will consist of a single circuit ACSR cable with one conductor per phase that will provide at least 70 MW of transfer capability at 115 kV (PDEF 1998a, AFC page 3.5-5). The line will be constructed on 130-foot lattice or steel poles every 500 to 700 feet (PDEF 1998k, AFC page 5.13-2 & Map 3.2-1). The appropriate right of way width will be obtained. The conductor sizes of the two transmission line routes will be determined later in the design phase. Conditions of certification have been provided to cover this eventuality (TSE-1d).

Two alternative transmission line routes have been assessed for interconnecting into the existing Pittsburg Power Plant switchyard. The transmission line connecting into the two USS-POSCO substations has one alternative. (see **Alternatives**)

SYSTEM RELIABILITY

INTRODUCTION

A system reliability evaluation consists principally of determining if there would be thermal overloads, voltage violations (voltages too high or low), and/or electric system instability (excessive oscillations) caused by the addition of the new project to the electric system. In addition to the above analysis, additional studies are performed to verify that there is sufficient reactive power (see **Definition of Terms**) available. The reliability evaluation must be conducted for all credible “emergency” conditions that the system might be subjected to. For example, loss of a single or double circuit lines, loss of a transformer, or a combined loss of these facilities. Planning analyses are conducted in advance of potential system changes, such as the addition of the PDEF into the system, in order to prevent a criteria violation. The criteria being used in this evaluation to determine conformance includes the WSCC Planning Criteria, NERC Planning Standards and applicable Cal-ISO reliability criteria. System reliability implications of the PDEF and the need for additional facilities related to interconnecting the project will be determined by the Cal-ISO based on the Detailed Facilities Study. A preliminary determination of compliance with applicable reliability criteria has been provided by the Cal-ISO (ISO 1998d).

SCOPE OF RELIABILITY STUDIES

The PDEF will have a maximum plant delivery of 506 MW. Power delivered from the PDEF to the existing Pittsburg Power Plant switchyard will impact power flows on the existing transmission lines and substations in the Greater Bay Area. PG&E performed a Preliminary Facilities Study that included power flow studies that identified potential transmission capacity deficiencies. A preliminary short circuit study was also performed (PDEF 1998l, AFC pages 2-4). A final short circuit and stability study will be provided in the Detailed Facilities Study approximately in May 1999 (CEC 1998v, pers. comm.).

Power flow cases for a 2001 summer peak year were run with and without the PDEF. The purpose of these studies was to determine which, if any, transmission facilities would become overloaded due to the PDEF being added to the system and evaluate the impact of the PDEF to the Bay Area’s voltages.

The 2001 summer peak base case has a peak load of 8,560 MW in the Bay Area. A 115 kV case with higher loads in the Diablo and East Bay Divisions[2] was also run as a sensitivity case. The cases were run with full output from both the Pittsburg Power Plant (2,022 MW) and Contra Costa Power Plant (1,260 MW) and the Bay Area combustion turbines were on-line.

The cases included transmission transformer emergency ratings and included the following changes that are to be implemented before the year 2001:

- 4 foot per second wind speed line ratings[3] for the Pittsburg-San Ramon 230 kV, Pittsburg-Tassajara 230 kV, Moraga-San Ramon 230 kV, Clayton-Meadow Lane 115 kV, Lakewood Jct-Meadow Lane 115 kV and Lakewood-Moraga Jct 115 kV lines, and

- a new Robles substation connected to the Pittsburg-Moraga circuit with load transferred from the Lakewood substation and Tassajara substation.

PG&E studied five transmission alternatives labeled 1, 2A, 2B, 3A and 3B described in detail below (PDEF 1998l, AFC pages 7-13). Alternative 1 represents the applicant's alternative route 1. Alternative 2A represents the applicant's proposed route 10. Alternatives 2B, 3A and 3B are variations of the proposed route. The applicant's alternative route 10A was not modeled (PDEF 1998k, AFC Map 3.2-1). The Preliminary Facilities Study did not model the underground effects. This will be modeled in the Detailed Facilities Study. No significant problems are anticipated.

Alternative 1 is a double circuit overhead 115 kV line that interconnects the PDEF to the Pittsburg-Contra Costa-Dow Chemical No. 1 & 2 115 kV circuits using 2300 kcmil all aluminum conductor (AAC) two-conductor bundled. In order to allow the PDEF to generate at full output with one line out, the following lines would have to be reconductored with 2300 kcmil AAC conductors bundled or other mitigation measures implemented:

1. Pittsburg-Columbia Steel 115 kV
2. Pittsburg-Kirker-Posco 115 kV
3. Posco-Columbia Steel 115 Kv

A sensitivity case was run using 1113 kcmil AAC for the outlet instead of 2300 kcmil conductor. The applicant, for economic reasons, requested the study using 1113 kcmil AAC. In this case, with one line out of service, the PDEF would have to curtail its generation by 150 MW in order to prevent overloading the remaining line. For this reason, 2300 kcmil is the proposed conductor size to be used for the overhead portion of the project.

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[2] The Diablo Division includes Pittsburg, Martinez, Concord and Walnut Creek areas. The East Bay Division includes Oakland, Richmond, Berkeley, San Leandro and Pinole areas.

[3] PG&E utilizes a four foot per second (fps) wind speed rating on existing lines if studies demonstrate that actual wind speeds in the area support such a rating. Before a line can be re-rated utilizing four fps wind speed, PG&E must perform an analysis of the individual line to verify that the line is able to utilize this higher rating.

Alternative 2A constructs a double circuit overhead 115 kV line from the PDEF to the existing Pittsburg Power Plant switchyard with the capability to take full the PDEF output with one line out. The 115 kV overhead transmission line will exit the switchyard and proceed in a southwesterly direction to the east side of Harbor at 8th Streets. The line then continues in a westerly direction in the 8th Street median. Just west of Montezuma Street, the line travels in a northwesterly direction and connects to the existing 115 kV switchyard at the Pittsburg Power Plant. Other work involved includes installing new circuit breakers and associated switches at the Pittsburg Power Plant 115 kV bus.

This alternative represents the applicant's proposed route (Route10) as described in the AFC Supplement, except that a portion of the proposed route is underground (PDEF 1998k, AFC Map 3.2-1). At Harbor and 8th Streets the line transitions to underground and continues in a westerly direction in the 8th Street median. Just west of Montezuma Street, the line rises overhead and travels in a northwesterly direction and connects to the existing 115 kV switchyard at the Pittsburg Power Plant.

Alternative 2B is the same as the proposed route for the project, except that it is a triple circuit 115 kV transmission line. With one circuit out, the PDEF could still generate at full output. The overhead portion will be constructed with 2300 kcmil AAC and the underground section with 3200 kcmil copper (Cu) solid dielectric cables and associated transition stations (PDEF 1998, response to modifications and issues workshop). Other work includes installing new circuit breakers and associated switches at the existing Pittsburg Power Plant 115 kV bus.

Alternative 3A is the same route as 2A, except the voltage is 230 kV.

Alternative 3B route is the same as 2B, but uses two underground 230 kV high-pressure oil-filled pipe type cables with 3200 kcmil Cu conductors. Output from the PDEF would be limited to the capacity of one cable, approximately 400 MVA, in the event of an outage of the other underground cable thus requiring curtailment of 126 MW.

Short Circuit Study Results

The short circuit study was conducted to determine what if any impacts the PDEF would have on the fault duties of existing transmission facilities, specifically the existing Pittsburg Power Plant switchyard. At the applicant's request, PG&E used 'typical' generator short circuit data. The estimated fault duties at the existing Pittsburg Power Plant switchyard with and without the PDEF are shown in the **TRANSMISSION SYSTEM ENGINEERING Table 1** (PDEF 1998l, AFC page 4):

TRANSMISSION SYSTEM ENGINEERING Table 1
Estimated Fault Duties at the Existing Pittsburg Power Plant

	No PDEF	Alternative #1	Alternative #2	Alternative #3
115 kV bus				
L-G Faulted Phase (AMPS)	40,714	47,322	51,523	41,650
3-Phase Fault (AMPS)	34,662	41,638	44,835	35,562
230 kV bus				
L-G Faulted Phase (AMPS)	49,703	51,224	51,911	56,111
3-Phase Fault (AMPS)	43,536	45,247	45,886	49,053

The breakers will be sized to comply with the above fault duties.

RELIABILITY STUDY RESULTS

The following contingency analyses were performed:

- Single generator outage (G-1)
- Single line outage (L-1)
- Single transformer outage (T-1)
- Overlapping outages of Potrero Power Plant Unit 3 and L-1 were also run. The Potrero Unit 3 was selected because it has the largest impact on line loadings in the Bay Area load center. This outage contingency is referred to as Potrero #3.

TRANSMISSION SYSTEM ENGINEERING Table 2 shows the results (which lines overload) of the power flow analysis after PDEF was added to the system: a) under normal overload conditions (see **Definition of Terms**), b) Potrero Power Plant Unit 3 out of service, c) emergency overload conditions, also known as an L-1 contingency (see **Definition of Terms**), and d) overlapping emergency overload conditions and Potrero Power Plant Unit 3 out of service.

TRANSMISSION SYSTEM ENGINEERING Table 2
A. Normal Overload Conditions

Circuit	Voltage	Alternative 1 or 2	Alternative 3
Pittsburg-Tassajara	230 kV	1.07[4]	1.08
Clayton-Lakewood Jct	115 kV	1.03	No
Lakewood Jct-Lakewood	115 kV	1.43	No

Source: PDEF 1998l, AFC page 5.

[4] A value stated as 1.07 indicates that the circuit is loaded to 1.07 times its rating or 107 percent, which is a seven percent overload.

B. Potrero Power Plant Unit 3 Out of Service

Circuit	Voltage	Alternative 1 or 2	Alternative 3
Pittsburg-San Ramon	230 kV	No	1.00
Pittsburg-Tassajara	230kV	1.09	1.08
Clayton-Lakewood Jct	115kV	1.03	No
Lakewood Jct-Lakewood	115kV	1.44	No
Station J-Owen Tap	115kV	1.04	No

Source: PDEF 1998l, AFC page 5.

C. Emergency Overload Conditions

Circuit	Voltage	Alternative 1 or 2	Alternative 3
Pittsburg-Rossmoor	230 kV	No	1.01
Pittsburg-San Ramon	230 kV	1.01	1.02
Pittsburg-Tassajara	230 kV	1.05	1.06
Clayton-Lakewood Jct	115 kV	1.39	1.11
Lakewood Jct-Lakewood	115 kV	1.39	No
Moraga-Moraga Jct	115 kV	1.13	No
Pittsburg-Clayton 1&2	115 kV	1.25	1.06
Pittsburg-Clayton 3	115 kV	1.04	No
Station J-Owens Tap	115 kV	1.10	1.05
Owens Tap-Edes Grant	115 kV	1.06	1.01
Edes Grant-Grant	115 kV	1.06	1.01

Source: PDEF 1998l, AFC page 5.

D. Overlapping L-1 and the Potrero Power Plant Unit 3 Out of Service

Circuit	Voltage	Alternative 1 or 2	Alternative 3
Pittsburg-Robles	230 kV	No	1.00
Pittsburg-Rossmoor	230 kV	No	1.02
Pittsburg-San Ramon	230 kV	1.02	1.02
Pittsburg-Tassajara	230 kV	1.07	1.08
Clayton-Lakewood Jct	115 kV	1.40	1.12
Lakewood Jct-Lakewood	115 kV	1.40	1.01
Moraga-Moraga Jct	115 kV	1.15	No
Pittsburg-Clayton 1&2	115 kV	1.26	1.06
Pittsburg-Clayton 3	115 kV	1.05	No
Owens Tap-Edes Grant	115 kV	1.12	1.06

Source: PDEF 1998l, AFC page 6.

In all cases, reducing generation could eliminate the normal and emergency overloads caused by the PDEF being added to the system. The **TRANSMISSION SYSTEM ENGINEERING Table 3** below shows the amount of generation required to mitigate the identified overloads (PDEF 1998l, AFC Attachment 4).

TRANSMISSION SYSTEM ENGINEERING Table 3
Amount of Generation Required to Mitigate Line Overloads

Case	Alternative 1 or 2	Alternative 3
	Decreased Generation Required (MW)	Decreased Generation Required (MW)
Bay Area Case Normal	342	245
Bay Area Case Emergency	351	305
Potrero #3 Normal	492	506
Potrero #3 Emergency	502	506

The Cal-ISO has reviewed PG&E's Preliminary Facilities Study and has determined that due to the networked configuration of the system surrounding the Pittsburg Power Plant, an off-peak or partial peak analysis is required. A preliminary partial peak study has been completed and at the Committee Status Conference held in Pittsburg on February 17, 1999, the Cal-ISO stated that a total of seventeen lines would be overloaded based on peak and partial peak power flow analysis (PDEF 1998u). The specific list of overloaded lines is included in the Cal-ISO's conclusions and preliminary findings regarding PDEF's transmission interconnection letter to Rod Maslowski of PG&E (ISO 1998d). PG&E is scheduled to complete their study approximately in May 1999. Once the Cal-ISO receives and reviews this study, it can then make its determination as to how the overloaded lines will be mitigated.

The Cal-ISO is in the process of determining how impacted facilities due to new generators connecting to the Cal-ISO controlled electric grid will be handled in the restructured electric industry. Two solutions are currently being discussed. The first is the "No Grandfathering" solution that, if chosen, will allow the market to take care of any increased congestion caused by the addition of new generation to the Cal-ISO controlled grid. That is, the most costly generator would have their schedule limited in the real-time Cal-ISO dispatch when congestion occurs. The other solution is called "Advanced Congestion Cost Mitigation" solution. This solution would require the new generator to mitigate congestion impacts prior to connecting to the Cal-ISO controlled grid. The options for advanced mitigation include upgrading overloaded facilities, remedial action schemes (RAS), a combination of upgrading and RAS, or absorbing congestion costs caused by the new generation. Until the Governing Board makes a decision and appropriate Tariff language is filed at FERC, the Cal-ISO cannot present the applicant with its options for mitigating overloaded facilities. If the "No Grandfathering" solution were chosen, the applicant would not be responsible for mitigating any overloaded facilities, but would have to meet schedule limitations. Because of the uncertainties associated with the above process, no downstream facilities can be confidently identified at this time. The Cal-ISO will provide testimony on the Preliminary Detailed Facilities Study and will provide preliminary conclusions and findings in the Energy Commission's hearings.

There are additional uncertainties that make even more speculative what overloaded facilities the applicant might be required to mitigate in order to connect to the Cal-ISO controlled grid. These uncertainties include PG&E's 1998 Transmission Assessment (PG&E 1998) and the Calpine/Bechtel Delta Energy

Center (DEC) Project that filed its Application for Certification with the Energy Commission on December 18, 1998 (DEC 1998a AFC). PG&E's Transmission Assessment identifies potential projects that might be built due to load growth. Five of the overloaded lines identified above are included in these projects. Transmission projects proposed for load growth would not constitute projects engendered by the PDEF, but there is uncertainty that these load growth projects would actually be built.

Calpine/Bechtel provided a draft copy of the power flow study results run by PG&E as part of Calpine/Bechtel's Detailed Facilities Study for the DEC project. These sensitivities include the DEC project only, DEC and PDEF, and DEC with additional potential projects in the Bay Area. Based on the preliminary data, the number of overloaded lines range from 3 to 39. With both projects added to the system, study results show that 12 of the 17 lines that are overloaded by the PDEF are also impacted by DEC. The data also shows that with DEC alone and the additional potential projects in the Bay Area, only three lines are overloaded (DEC 1998b, AFC attachments 1-8). PDEF was urged to run similar sensitivities in its Detailed Facilities Study (CEC 1998v, pers. comm.). It is therefore possible but highly speculative that projects on the horizon will mitigate many of the PDEF overloads[5].

What the above information leads to is the speculative nature of what, if any, impacted facilities might have to be mitigated by the applicant. The Cal-ISO cannot grant interconnection approval to the applicant until FERC approves a Cal-ISO Governing Board policy regarding how impacted facilities will be addressed as new generation projects connect to the Cal-ISO controlled grid. At this time staff concludes that no transmission upgrades can be confidently identified due to the many uncertainties that surround this project. Completion of the Detailed Facilities Study and the subsequent issuance of the Cal-ISO's conclusions and findings regarding the study will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. A condition of certification (TSE-1g) is recommended to provide for Energy Commission review of the Detailed Facilities Study and the PG&E/applicant facility Interconnection Agreement.

ALTERNATIVES

OUTLET LINE

The applicant's proposed configuration for interconnecting into the switchyard at the existing Pittsburg Power Plant is a double circuit overhead and underground 115 kV transmission line (Route 10). The overhead section will be constructed with ACSR cable with two conductors per phase. The underground portion will be constructed with solid dielectric cable. Conductor sizes for both the overhead and underground sections will be determined later in the design phase of the project (See TSE-1d).

[5] Because of the interconnected nature of the system the injection of generation into one are of the system can reduce power flows in nearby areas. Reduced power flows can also be caused by changes in the redispatch of generation caused by new generating units.

The applicant has proposed two alternatives that will interconnect into the existing Pittsburg Power Plant switchyard. The first alternative (Route 10A) follows the same route as the proposed one, except instead of turning northwest near Beacon Street the line continues in a westerly direction approximately 3,000 feet and then turns northeast approximately 3,400 feet before connecting to the switchyard. This route will be more costly to the applicant because of its additional length, but will be considered by the applicant if the proposed route is not acceptable (PDEF 1998k, AFC Map 3.2-1).

The second alternative (Route 1) begins on the northeast side of the project site and travels south approximately 2,000 feet. The line then turns east along East Santa Fe Avenue approximately 2,000 feet, then north for approximately 700 feet where it connects to the #32 Columbia Steel Tap just south of the two USS-POSCO substations (PDEF 1998k, AFC page 5.13-2).

The proposed 115 kV single circuit transmission line going to the two USS-POSCO substations has one alternative. The proposed route (Route 11) will begin at the southwest side of the project and travel south from PDEF approximately 1,500 feet and east approximately 800 feet. The line then turns southeast along East Santa Fe Avenue approximately 1,800 feet, then north approximately 1,000 feet to the two USS-POSCO substations. The alternate route deviates from the proposed route in that the starting point for the line begins at the northeast section of the project, then travels south approximately 2,000 feet. It is at this point that the route description is the same along East Santa Fe Avenue as described above (PDEF 1998k, AFC Map 3.2-1).

CUMULATIVE IMPACTS

DEC filed its Application for Certification with the Energy Commission on December 18, 1998. The proposed DEC will be located east of the PDEF and intends to locate a portion of its underground transmission line in the same proposed median strip along 8th Street as that used by the PDEF. The existing 50-foot right of way will accommodate PDEF, but not both projects. Approximately 71 feet is required to accommodate both projects. Additional footage along the 8th Street median strip does exist.

Calpine/Bechtel has provided a draft copy of the power flow study results run by PG&E as part of Calpine/Bechtel's Detailed Facilities Study. As discussed in the **Reliability Study Results** section above, there is a number of compounding uncertainties that further complicate the issue of mitigating overloaded transmission lines and thus confidently identifying "downstream" facilities. Those uncertainties include: 1) how impacted facilities due to new generators connecting to the Cal-ISO controlled grid will be handled in the restructured electric industry, 2) PG&E's 1998 Transmission Assessment, and 3) DEC's preliminary power flow results. As previously discussed, PG&E identified potential projects that might be upgraded due to load growth. Of the seventeen lines overloaded by the PDEF, five of these lines are identified in the PG&E projects. DEC's preliminary power flow results indicate that the number of overloaded lines range from 3 to 39. These results indicate that the cumulative system response to multiple projects may reduce line overloads in

the area, however there is insufficient information to confidently identify "downstream" facilities (if any) for either the PDEF or DEC at this time. Only potential "outlet" lines can be identified at this time.

FACILITY CLOSURE

INTRODUCTION

The parallel operation of generating stations is controlled, in part, by CPUC Rule 21. This rule and standard utility practices for interconnecting a generating unit provide for the participating transmission owner (PTO) to have control of breakers and disconnect switches where the outlet line terminates (the existing Pittsburg Power Plant switchyard) and general control over the interconnected generators. Prior to construction and interconnection of a generating unit, the PTO reviews and comments on the plans and specifications for the power plant and termination equipment that is important to safe and reliable parallel operation[6] and inspects the interconnection facilities. Contractual provisions may be developed to provide backup or other power service and codify procedures to be followed during parallel operation. Before generating stations are permitted to bid into the Cal-PX and be dispatched by the Cal-ISO, generator standards must be met and the generating station must commit to comply with instructions of the Cal-ISO dispatchers. All participating generators must sign a Participating Generator Agreement (Cal-ISO 1998a, Cal-ISO 1998b). Procedures for planned, unexpected temporary closure and unexpected permanent closure must be developed or verified to facilitate effective communication and coordination between the generating station owner, PTO and the Cal-ISO to ensure safety and system reliability.

CPUC General Order 95, Rule 31.6 requires that "lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a public nuisance or a hazard to life or property." Condition of Certification TSE-1c requires compliance with this rule.

The ability of the above LORS to reasonably assure safe and reliable conditions in the event of facility closure was evaluated for three scenarios, as described below:

PLANNED CLOSURE

This type of closure occurs in a planned and orderly manner such as at the end of a facility's useful economic or mechanical life or due to gradual obsolescence. Under such circumstances the requirement for the owner to provide a closure plan 12 months prior to closure in conjunction with applicable LORS is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the PTO[7] to assure (as one example) that the PTO's system will not energize the project switchyard. Alternatively, the

[6] As an example the PTO has control over the generating unit breakers so that only when the PTO's line crews have completed maintenance, for instance and are clear of the line or other facilities could the unit reclose into the system.

[7] The PTO in this instance is PG&E e.g., the system owner to which the project is interconnected.

owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads[8].

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishment of an on-site contingency plan (see **General Conditions Including Compliance Monitoring and Closure Plan**).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan that is in place and approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facilities will be developed to assure safety and reliability (see **General Conditions Including Compliance Monitoring and Closure Plan**).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff and the Cal-ISO have reviewed PG&E's Preliminary Facilities Study. Staff agrees with the Cal-ISO's determination that partial peak analysis is required due to the networked configuration of the system surrounding the Pittsburg Power Plant. PG&E is scheduled to complete the Detailed Facilities Study approximately in May 1999. Once the Cal-ISO receives and reviews the study, it can then make its determination as to how any identified reliability criteria violations will be mitigated. There is uncertainty regarding what transmission upgrades are reasonably foreseeable as the result of the PDEF Project. Staff does not believe that any specific upgrades can currently be identified and described as reasonably foreseeable consequences of the project.

The conductor sizes of the transmission lines have not been determined at this time. Such decisions will be made during the design phase of the project subsequent to certification. Once the applicant makes this determination, staff will assess whether conductor sizes are adequate according to industry standards (see TSE-1d). A final short circuit analysis has yet to be performed in order to assure that the breaker ratings are sufficient to withstand high levels of current during a fault. This short circuit analysis will be provided in the Detailed Facilities Study and used to determine breaker ratings (see TSE-1b).

[8] These are mere examples many more exist.

RECOMMENDATIONS

If the Committee approves the PDEF Project, staff recommends that the following conditions of certification be adopted.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to requirements 1a through 1f listed below. The substitution of CPM approved "equivalent" equipment and equivalent switchyard configurations is acceptable.

a. The project 115 kV switchyard shall include a breaker-and-a-half, breaker and bus configuration.

b. Breakers and bus shall be sized to comply with a short circuit analysis.

c. The transmission facilities shall meet or exceed the requirements of CPUC General Order 95 and CPUC General Order 128.

d. An approximately two mile long double circuit 115 kV overhead and underground line will be constructed and interconnect into the existing Pittsburg Power Plant switchyard. The overhead portion will use steel pole construction with ACSR cable with two conductors per phase. The underground portion will use solid dielectric cable. The approximately 1.2 mile transmission line connecting into the two USS-POSCO substations will consist of a single circuit ACSR cable with one conductor per phase. The line will be constructed on 130-foot lattice or steel poles. A study will be provided for all overhead and underground cables to justify conductor sizes.

e. Termination facilities at the existing Pittsburg Power Plant switchyard shall comply with applicable Cal-ISO and PG&E interconnection standards (CPUC Rule 21).

f. Outlet line parallels and crossings with other transmission or distribution lines shall be coordinated with the transmission/distribution line owner and comply with the owner's standards.

g. The applicant shall provide a Detailed Facilities Study and an executed facility Interconnection Agreement for the PDEF transmission interconnection with PG&E. The Detailed Facilities Study and Interconnection Agreement shall be coordinated with the Cal-ISO.

At least 60 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM, electrical one-line diagrams signed and sealed by a registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements 1a through 1g above. The project owner will also

provide the conductor sizes for both the overhead and underground portion of the project, the Detailed Facilities Study and the Interconnection Agreement (if either one are not otherwise provided to the Commission). Substitution of equipment and substation configurations shall be identified and justified by the project owner for CPM approval.

TSE-2 The project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1a through 1g of TSE-1, and have not received CPM approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment, transmission facilities or switchyard configurations shall not begin without prior written approval of the changes by the CPM.

At least 30 days prior to construction of transmission facilities, the project owner shall inform the CPM of any impending changes which may not conform to requirements 1a through 1g of TSE-1 and request approval to implement such changes.

TSE-3 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction and any subsequent CPM approved changes thereto, to ensure conformance with CPUC GO-95, CPUC GO-128 and CPUC Rule No. 21 and these conditions. In case of non-conformance, the project owner shall inform the CPM in writing within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Within 60 days after synchronization of the project, the project owner shall transmit to the CPM an engineering description(s) and one-line drawings of the “as-built” facilities signed and sealed by a registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95, CPUC GO-128 and CPUC Rule No. 21 and these conditions shall be concurrently provided.

REFERENCES

CEC (California Energy Commission/White) 1998s. Summary of the December 15, 1998 Staff Information and Issues Workshop, Pittsburg District Energy Facility (98-AFC-1). Submitted to Workshop Participants, January 4, 1999.

DEC (Delta Energy Center, Calpine/Bechtel) 1998a. Application for Certification. Delta Energy Center (98-AFC-3). Submitted to the California Energy Commission, December 1998.

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NERC (North American Electric Reliability Council). 1997. NERC Planning Standards, September 1997.

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PDEF (Pittsburg District Energy Facility, LLC/Thompson) 1998l. Preliminary Facilities Study Enron Pittsburg District Energy Facility (December 4, 1998). Submitted to the California Energy Commission, December 7,1998.

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PG&E (Pacific Gas and Electric Company). 1998. 1998 Annual System Assessment of PG&E Electric Transmission System, November 30, 1998.

CEC (California Energy Commission/O'Neill) 1998v. Report of conversation with Pittsburg District Energy Facility, LLC representatives, PG&E and Cal-ISO regarding the Cal-ISO approval process and the Energy Commission's licensing process for the Pittsburg District Energy Facility, February 24, 1999. Submitted to the California Energy Commission, February 26, 1999.

WSCC (Western Systems Coordinating Council). 1998. Reliability Criteria, August 1998.

DEFINITION OF TERMS

ACSR	Aluminum cable steel reinforced. A composite conductor made up of a steel core surrounded by aluminum wire.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.
Bundled	Two wires 18 inches apart.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) which carries the current.
Congestion Management	Congestion management is a scheduling protocol, which provides that dispatched generation, and transmission loading (imports) will not violate criteria.
Emergency Overload	See Single Contingency. This is also called an L-1.
Kcmil or kcm	Thousand circular mil. A unit of the conductor's cross sectional area; when divided by 1,273, the area in square inches is obtained.
Kilovolt	kV. A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.
L-1	The outage of a single circuit.
Megavar	One megavolt ampere reactive.
Megavars	Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.
Megavolt ampere	MVA. A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt	MW. A unit of power equivalent to 1,341 horsepower.
Normal Operation/ Normal Overload	When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.
N-1 Condition	See Single Contingency. Also called an L-1.
Outlet	Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.
Power Flow Analysis	A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.
Reactive Power	Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.
Remedial Action Scheme (RAS)	A remedial action scheme is an automatic control provision that, for instance, will trip a selected generating unit upon a circuit overload.
SF6	Sulfur hexafluoride is an insulating medium.
Single Contingency	Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.
Solid dielectric cable	Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.
Thermal rating	See ampacity.
TSE	Transmission System Engineering.
Undercrossing	A transmission configuration where a transmission line crosses below the conductors of another transmission line – generally at 90 degrees.
Underbuild	A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Testimony of Eileen Allen & Lorraine White

PURPOSE OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to provide the Energy Commission with 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(d)) (Cal. Code Regs., tit. 20, § 1765) This analysis identifies the potential significant impacts of the proposed project, and those project alternatives that are capable of reducing or avoiding significant impacts.

Section 25540.6(b) of the Warren-Alquist Act states that an analysis of alternatives sites is not necessary for cogeneration projects at existing industrial sites. However, Energy Commission staff has looked at several alternative sites in response to public comments regarding other site possibilities in the vicinity of the Pittsburg District Energy Facility's (PDEF) cogeneration steam host, USS-POSCO.

FACTORS LIMITING THE RANGE OF SITE AND LINEAR FACILITY ROUTE ALTERNATIVES

The purpose of this section is to list the factors which staff believes limit the ability to examine a broad range of site alternatives and alternatives to the proposed routes for the linear facilities.

- Cogeneration projects such as the proposed PDEF require a steam line connection between the power plant site and the existing industrial steam user (i.e., the steam host). The steam line is generally limited to a length no greater than one-half mile; beyond which there is a significant loss of heat.[1] Therefore, potential sites and site alternatives usually need to be located within one-half mile of the steam host.

- Pacific Gas & Electric's (PG&E) December 1998 Preliminary Facilities study for the PDEF project indicates that the project must connect with the existing Pittsburg substation which is approximately two miles west of the proposed site.[2]

[1] Cogeneration steam lines can never be perfectly insulated to reduce heat losses. When the line is longer than about one-half mile, the quality of steam that must be supplied detracts from the power plant's efficiency and can make the cogeneration project less economic.

[2] The applicant had originally proposed a transmission connection to an existing PG&E 115 kV line located east of Loveridge Road. However, the December 1998 Preliminary Facilities Study showed that this option could lead to numerous circuit overloads, whereas a connection to the Pittsburg Power Plant substation appeared to be more feasible. Geographically, there are two options for connecting the PDEF with the substation, which is west of the densely developed downtown /marina area of Pittsburg: 1) running an underground line from the site west along 3rd Street and across Marina Park; and 2) running an overhead line from the site to Harbor and 8th Streets, where the line would run underground along 8th Street.

- The PDEF will use reclaimed water for cooling from the Delta Diablo Waste Treatment Facility (DDWTF), necessitating construction of a new, underground reclaimed water line from the power plant to DDWTF. The applicant has chosen a route that avoids impacts on Dowest Slough, which is located just west of DDWTF.

- The project's proposed, new underground gas pipeline will connect to an existing PG&E gas pipeline located approximately 3 miles southeast of the PDEF site.

ALTERNATIVES ANALYSIS METHODOLOGY

To prepare this alternatives analysis, staff used the methodology summarized below:

- Identify the basic objectives of the project.
- Provide an overview of the project and potentially significant adverse impacts.
- Identify and evaluate alternative electricity generation technologies
- Conduct a screening analysis to assess the feasibility of the alternative sites mentioned by members of the public.

PITTSBURG DISTRICT ENERGY FACILITY

BASIC PROJECT OBJECTIVES

After studying the PDEF Application for Certification (AFC), Energy Commission staff has determined the project's objectives to be:

- To build and operate a reliable cogeneration power plant with a connection to USS-POSCO Industries in Pittsburg, California.
- To generate approximately 450 megawatts of electricity which will be sold in the electricity market through the Independent System Operator.
- To provide up to 60 megawatts of electricity to USS-POSCO.
- To provide approximately 75,000 pounds per hour (on average) of steam to USS-POSCO for use in their industrial processes.
- To assist the City of Pittsburg by building a long planned waterfront truck route (also known as the Truck Bypass Road) designed to improve access to the Third Street industrial area, and to help Pittsburg realize its economic development goals.

PROJECT DESCRIPTION

The proposed project is located on an existing 12 acre industrial site owned by USS-POSCO industries in the northeast corner of the City of Pittsburg, in Contra Costa County. The site was formerly used for sludge drying and wastewater treatment related to steel production and is now unused. Approximately eight acres of the site contain arsenic contaminated soil. The applicant plans to cap the

contaminated soil area with additional layers of fill and asphalt. The California Department of Toxic Substances Control has cleared the site for industrial development.

Adjacent land uses include the Pittsburg Marine Terminal Petroleum Coke Handling Facility to the northwest, the GWF power plant to the northeast, the USS-POSCO steel mill to the southeast, Dow Chemical's petrochemical production facility to the east, and a Johns-Manville sheetrock production facility to the west. The site is zoned for general industrial uses with electric power plants being allowed in this zone. The nearest occupied residences, which are the closest noise receptors, are approximately 1800 feet from the project site.

The proposed PDEF site lies within an approximately 65 acre area, owned by USS-POSCO, called "Area LB". The area's northern boundary is 3rd Street, with the southern boundary near East Santa Fe Avenue. Harbor Street is the area's western boundary, with USS-POSCO's mill forming the eastern boundary. Within this previously developed, and now unused USS-POSCO area, the proposed site was chosen because it was available for development, it was at least 12 acres in size, and it was further away from residences than site possibilties fronting on Harbor Street or East Santa Fe Avenue.

The applicant has requested certification for a nominal 500 megawatt cogeneration power plant providing steam and electricity to USS-POSCO and selling the remaining electricity to the deregulated power market. A new reclaimed water supply and discharge line connected to the DDWTF will be installed by the applicant to provide the project with tertiary treated water for cooling. The applicant plans to build a new 115 kV electric transmission line to connect the project with PG&E's existing Pittsburg substation, and another 115 kV line to supply power to USS-POSCO. A portion to the line to PG&E's facility will be underground to along 8th Street between Harbor and Beacon Streets. Where the line transitions from above ground to below ground, and vice-versa, transition facilities will be required. Other planned linear facilities include a new 3.6 mile underground natural gas pipeline to be connected with an existing PG&E gas pipeline, and a new truck bypass road to be built on USS-POSCO and Union Pacific Railroad property. The purpose of the truck bypass road is to support the City of Pittsburg's effort to reroute existing marine terminal truck traffic, and to provide access to the project site.

POTENTIALLY SIGNIFICANT ADVERSE IMPACTS

The environmental consequences of the proposal are discussed in detail in the individual sections of the FSA. Staff believes that potentially significant adverse impacts may occur in the air quality area, although project emissions may be adequately offset to mitigate their impacts, and in the area of visual resources.

ALTERNATIVES TO THE PROJECT

GENERATION TECHNOLOGY ALTERNATIVES

Public Resources Code section 25305(c) limits the scope of alternatives analysis during a siting case under specific conditions. This section states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's Electricity Report and shall not be considered as alternatives to a proposed facility during the siting process. Thus, such alternatives are not included in this Final Staff Assessment (FSA).

Staff did compare various alternative technologies with the proposed project, scaled to meet the project's objectives. We examined the principal electricity generation technologies which do not burn fossil fuels such as natural gas. The technologies which could serve as alternatives to the proposed project are geothermal, solar, hydroelectricity, and wind. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions.

There are geothermal resources to the north at the Geysers in Sonoma and Lake Counties. However, the Geysers is currently an uncertain steam resource, and the distance from the Geysers to Pittsburg would preclude its use for a cogeneration project. Solar and hydroelectric resources in the San Francisco Bay Area region are insufficient for commercial scale electricity generation. The Montezuma Hills region to the north in Solano County does have some wind generation activity. However, the intermittent nature of the wind resource and the 1-2 mile distance from the Hills to the project site across the Sacramento River and the New York Slough, would preclude its use for a cogeneration project. Staff believes there are no local generation technology alternatives that would reliably serve a cogeneration project with its need to be close to its industrial steam host.

Staff also considered the possibility of a smaller sized cogeneration alternative, such as a 240 MW gas fired combined cycle project, located at the PDEF site. Although the actual quantity of emissions would be smaller, since the emissions from both the 500 MW proposed project and a smaller project could be offset, the smaller project alternative would not result in a greater reduction of potential impacts. In addition, the applicant would most likely be required to interconnect at the PG&E facility in this scenario as well and thus, propose similar transition facilities to underground its transmission line along 8th Street.

ALTERNATIVE SITE SCREENING ANALYSIS

Alternative sites (see **ALTERNATIVES Figure 1**) were identified through a review of the applicant's AFC discussion of an alternative site, review of public comments regarding location alternatives, and staff discussion with USS-POSCO. Public comments included suggestions that staff look at the proposed Air Liquide project site, the proposed Delta Energy Center site, and other areas within USS-POSCO's property.

ALTERNATIVES Figure 1
Site Alternatives

Staff's discussions with USS-POSCO focused on the status of the truck loading yard and parking lot located between the mill and USS-POSCO's marine dock, and two undeveloped areas on USS-POSCO property. The truck loading yard/parking lot is actively and completely used now. The first undeveloped area, "Area LB", contains PDEF's proposed site. The second undeveloped area, "Area LA", is discussed as an alternative site option, with an explanation of its infeasibility.

SITE ALTERNATIVES

PDEF'S SITE ALTERNATIVE

SITE DESCRIPTION

- The applicant had some discussion with the landowner of the alternative site, Dow Chemical, regarding possible availability of this site during the preliminary planning stages of the PDEF project.
- The approximately 10 acre site is located on the New York Slough waterfront on the western edge of Dow Chemical's property.
- A power plant and related transmission line at this alternative site would be visible to boaters along New York Slough. Staff has concluded that any visual impacts would be insignificant, given the highly industrial nature of the area, and the boaters' brief exposure.
- Staff has assumed that a project located at this alternative site would have a 115 kV transmission line and related towers on a route currently occupied by PG&E's Contra-Costa Pittsburg 60 kV line, until the intersection of Third and Columbia Streets. At this point we assume that the placement of the towers and transition station would be similar to that of the proposed project. Although this potential transmission route is longer, the visual impact would be similar to that of the proposed project. The additional section along the waterfront would likely replace an existing line in a highly industrial area, and its exposureed to boaters would be brief.
- Surrounding land uses include Dow Chemical's production facilities, and USS-POSCO's marine dock, and truck loading yard/parking lot.
- Zoning (General Industrial (I/G)) and General Plan designations are compatible with industrial use.
- The nearest residence is approximately one mile away.

ADVANTAGES

- A project located at this alternative site would be further away from residences than the proposed site. Therefore, potential noise impacts would be diminished when compared with the proposed project.

DISADVANTAGES

- Dow Chemical has not made this site available to the applicant for development. The AFC states on p.6-3 that "other Dow activities precluded locating the plant on Dow property."

AIR LIQUIDE SITE ALTERNATIVE

SITE DESCRIPTION

- The 5 acre site is located immediately east of the USS-POSCO steel mill facility on 3rd Street where it intersects Columbia Street. in Pittsburg.
- Zoning (General Industrial (I/G)) and General Plan designations are compatible with industrial use. This alternative site is adjacent to the proposed site, therefore the surrounding land uses are the same.
- The site was proposed for an industrial gas production facility in 1997.
- The nearest residences are located approximately 2000 feet away.
- Staff has assumed that a project located at this alternative site would have transmission line towers and a transition station located on a route very similar to that for the proposed project.

ADVANTAGES

- This alternative site is nominally further away from residences than the proposed site. Therefore, potential noise impacts would be slightly diminished when compared with the proposed project.

DISADVANTAGES

- The site is not available, because USS-POSCO has a contract with the Air Liquide Company for development of an industrial gas production facility. This project appears to be inactive right now, but the contract remains valid.
- The site is smaller than the 12 acres required by the PDEF applicant.

PROPOSED DELTA ENERGY CENTER SITE ALTERNATIVE

SITE DESCRIPTION

- The Calpine Company filed an AFC with the Energy Commission in December 1998 for its proposal to build the Delta Energy Center,an 880 MW merchant power plant.
- The 20 acre site is located on Arcy Lane north of the Pittsburg-Antioch Highway and east of Loveridge Road. The parcel is in the City of Pittsburg, just east of the corporate boundary between the Cities of Pittsburg and Antioch.
- Zoning (General Industrial (I/G)) and General Plan designations are compatible with industrial use. Surrounding land uses include the DDWTF to the south, Dow Chemical facilities to the north, and vacant land owned by Dow Chemical.
- The nearest residence is located approximately 2300 feet away.
- Staff has assumed that a project located at this alternative site would have an overhead 115 or 230 kV transmission line paralleling or replacing an existing PG&E 115 kV line that runs through USS-POSCO. At the intersection of

Harbor and 8th Streets, the assumed transmission route would be similar to the proposed project, with a transition station and an underground line running along 8th Street until it reached the Pittsburg Power Plant substation.

ADVANTAGES

- This alternative site is further from residences than the proposed site.

DISADVANTAGES

- The landowner, Dow Chemical, has not made this site available to the applicant.
- This alternative site is approximately one mile away from the center of USS-POSCO's mill facility. This distance would result in a steam line longer than a half mile, which would make the steam quality uncertain, and the overall feasibility of a cogeneration project speculative.

OTHER SITE ALTERNATIVE POSSIBILITIES WITHIN USS-POSCO PROPERTY

SITE DESCRIPTION

- USS-POSCO owns an undeveloped parcel, "Area LA", which is approximately 80 acres in size. The area's western boundary is east of the baseball fields near Columbia Street on the Pittsburg-Antioch Highway, with the southern boundary fronting on the Pittsburg-Antioch Highway, USS-POSCO's buildings form the northern boundary, and the eastern boundary is near Loveridge Road.
- Residential development is located approximately 2000 feet from the area's northeastern boundary.
- Staff has assumed that a project located at this alternative site would have an overhead 115 or 230 kV transmission line paralleling or replacing an existing PG&E 115 kV line that runs through USS-POSCO At the intersection of Harbor and 8th Streets, the assumed transmission route would be similar to the proposed project, with a transition station and an underground line running along 8th Street until it reached the Pittsburg Power Plant substation.

ADVANTAGES

- This area is nominally further away from residences than the proposed site.

DISADVANTAGES

- This area is in the very preliminary stages of soil remediation, with years of work ahead before industrial site development would be possible.

THE "NO PROJECT" ALTERNATIVE

CEQA requires consideration of the "no project" alternative, requiring agencies to evaluate whether "no project" is environmentally preferable to the proposed project.

The project, described previously, would be a large industrial facility built in an industrial area on vacant land that is zoned industrial and has an industrial general plan designation. Since the project is a power plant, it requires a transmission line to deliver its power to the PG&E switchyard west of the project. The transmission line, as proposed by the applicant, would be above ground to a location near the perimeter of the industrial zone, which borders on a residential neighborhood. From this point, the applicant proposes that the transmission line go underground, re-emerging at a point near the switchyard.

If the PDEF project is approved and built with the environmental mitigation PDEF has proposed or already agreed to, Staff has identified only one environmental impact—-to visual resources--that is potentially significant. This significant impact results from the transmission lines, transmission poles, and "transition structures" that are required for the radial line to deliver generation to the Pittsburg switchyard. These ancillary facilities are located in close proximity to residential areas in Pittsburg. (For more detail on staff's visual resources analysis, please see the **VISUAL RESOURCES** section of this report).

Additional visual impacts from the project would occur from the project's steam plume, which would be present under various meteorological conditions. However, this impact is less than significant given the current industrial setting of the project.

If the project is not built, the significant visual impact of the project's transmission lines would be avoided. The steam plume and project structure would also, for the time being, be avoided, and the project site would remain vacant. However, the site is zoned industrial, and it is reasonably likely that another industrial project would eventually be constructed there. Such future project may or may not have steam plumes. A future project would be unlikely to have transmission facilities of the size required by the PDEF project unless such future project was another large power plant.

If the project is not approved or built, the energy efficiency advantages of a large industrial cogeneration project would not be realized. This foregone benefit is both environmental (energy efficiency) and economic. Other potential economic benefits would not occur. The City of Pittsburg would not realize the potentially significant economic benefits of "profit sharing" that it hopes to achieve. The new "truck bypass road" would not be built with assistance from the project, and perhaps would not be built at all. The truck bypass road may also be considered an environmental benefit in that it improves traffic circulation impacts. In addition, "no project" would make construction of a new large electricity generating power plant elsewhere in the San Francisco Bay Area much more likely.

Because of the potentially significant visual impact, staff considers the "no project" alternative to be environmentally superior to the project as proposed. At this time, mitigation has not been proposed, but staff believes it is possible to mitigate the adverse impacts to less than significant levels. If visual resource mitigation measures are determined and adopted for the project, staff believes that the project will have environmental benefits (mentioned above) that outweigh those of the "no project" alternative.

CONCLUSION

CEQA requires the project alternatives analysis to focus on measures that would mitigate a project's potential impacts to less than significant levels. These impacts are in the visual resources area. Staff believes that the potential air quality impacts will be mitigated through the applicant's purchase of air emission offsets. With respect to the visual impacts, no mitigation has been proposed at this time. However, staff is confident that reasonable mitigation can be developed.

The option of a smaller project, such as a 240 MW combined cycle cogeneration unit would still have visual impacts resulting from transmission towers, which would need to be mitigated similarly to the proposed project. Therefore, the smaller project option is not better than the proposed project.

Regarding the alternative sites examined, each of them does nothing to reduce the potential for visual resource impacts to a level lower than that of the proposed project. Specifically, it is likely that the alternative sites will require similar transmission towers and transition facilities as are proposed for the PDEF site, with similar visual impacts. Additionally, each is undesirable for various reasons. PDEF's alternative site is smaller than 12 acres, and Dow Chemical has not made it available for development. The Air Liquide site is smaller than 12 acres, and it is not available due to USS-POSCO's existing contract with the Air Liquide Company for another type of industrial development. The proposed Delta Energy Center site is not available due to Dow Chemical Company's existing contract with the Calpine Company for development of a competing power plant.

USS-POSCO agrees that it has a vacant parcel that would be large enough for the PDEF project. However, this parcel, "Area LA", has contaminated soil, with a remediation process in a very early stage.

After analyzing various alternatives for the PDEF, staff concludes that the proposed project, with minor configuration alterations, and additional mitigation as recommended by staff, is preferred.

REFERENCES

Calpine Corporation Bechtel Enterprises, Inc. 1998. Application for Certification for Delta Energy Center, Vol.1.

Peck, K. 1999. USS-POSCO staff. Interview by Eileen Allen. February 19.

Pittsburg District Energy Facility, L.L.C. 1998. Application for Certification for Pittsburg District Energy Facility.

Thompson, A. 1999. Counsel for Pittsburg District Energy Facility, L.L.C. Interview by Eileen Allen. February 24.

GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Jeri Zene Scott

INTRODUCTION

The Pittsburg District Energy Facility Project General Conditions including the Compliance Monitoring and Closure Plan (Compliance Plan) has been established as required by Public Resources Code, section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

General conditions that:

- set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
- establish requirements for facility closure plans.

Specific conditions of certification which are found following each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

- ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;

- resolving complaints;

- processing post-certification changes to the conditions of certification, project description, and ownership or operational control;

- documenting and tracking compliance filings; and,

- ensure that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission 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, it should be understood that the approval would involve all appropriate staff and management.

Pre-Construction and Pre-Operation Compliance Meeting

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising.

Energy Commission Record

The Energy Commission shall maintain as a public record in either the Compliance file or Docket file for the life of the project (or other period as required):

- all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;

- all monthly and annual compliance reports filed by the project owner;

- all complaints of noncompliance filed with the Energy Commission; and,

- all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

ACCESS

The CPM has the responsibility to ensure that the project is designed, constructed, operated and closed in compliance with the terms and conditions of the Energy Commission Decision. Without access to the facility, it is virtually impossible to determine whether or not the project owner is complying with the conditions of certification. Therefore, the CPM, designated staff, and delegated agencies or consultants, shall be guaranteed and granted 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.

COMPLIANCE RECORD

The compliance record serves as verification that the project was designed, constructed and operated in compliance with the terms and conditions of the Commission Decision. The documents contained in the compliance record demonstrate that the project owner, or its designated agents, complied with the conditions of certification. The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all “as-built” drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the conditions of certification.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given access to the files.

COMPLIANCE VERIFICATIONS

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary, by the CPM, in most cases without Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

- reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;

- appropriate letters from delegate agencies verifying compliance;
- Energy Commission staff audit of project records; and/or
- Energy Commission staff inspection of mitigation and/or other evidence of mitigation.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal**. The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification Submittal to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

Compliance Reporting

The project owner shall provide compliance reports to keep the CPM apprised of what is occurring on the power plant site during both the construction and operation phases. There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports.

During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix

A compliance matrix is to be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix will provide the

CPM with the current status of compliance conditions in a spreadsheet format. The compliance matrix must identify:

- the technical area;
- the condition number;
- a brief description of the verification action or submittal required by the condition;
- the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
- the expected or actual submittal date;
- the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable; and
- an indication of the compliance status for each condition (e.g., “not started”, “in progress” or “completed date”).

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

MONTHLY COMPLIANCE REPORT

During construction of the project, the project owner or authorized agent shall submit Monthly Compliance Reports within 10 working days after the end of each reporting month. The Monthly Compliance Report allows the CPM to keep track of the progress being made by the project owner during the construction phase. The CPM uses the Monthly Compliance Report to schedule site visits and to maintain a database of the project owner’s compliance with the conditions of certification.

Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

- 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;
- documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
- an initial, and thereafter updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);

- a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;

- a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;

- a cumulative listing of any approved changes to conditions of certification;

- a listing of any filings with, or permits issued by, other governmental agencies during the month;

- a projection of project compliance activities scheduled during the next two months;

- a listing of the month's additions to the on-site compliance file; and

- any requests to dispose of items that are required to be maintained in the project owner's compliance file.

The first Monthly Compliance Report is due the month following the Energy Commission business meeting at which the project was approved, unless the project owner notifies the CPM in writing that a delay is warranted. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

ANNUAL COMPLIANCE REPORT

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The CPM uses the Annual Compliance Report along with periodic site visits to ensure that the project owner is complying with on-going or operational conditions of certification.

The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

- an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);

- a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;

- documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;

- a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;

- an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;

- a listing of filings made to, or permits issued by, other governmental agencies during the year;

- a projection of project compliance activities scheduled during the next year;

- a listing of the year's additions to the on-site compliance file with a brief explanation of what the addition is; and

- an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].

CONFIDENTIAL INFORMATION

Any information, which the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, which is determined to be confidential, shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

DEPARTMENT OF FISH AND GAME FILING FEE

Pursuant to the provisions of Fish and Game Code, section 711.4, the project owner must remit to the California Department of Fish and Game (CDFG) a filing fee in the amount of eight hundred and fifty dollars ($850). The fee must be paid on or before the tenth day following the Energy Commission business meeting at which the project was approved. No construction may commence until the fees have been paid in full, and proof of payment is submitted to the CPM.

The project owner shall submit a copy of the CDFG receipt to the CPM within 30 days of the Energy Commission business meeting in which the project was approved. The receipt shall identify the project, indicate the date paid and specify the amount paid.

FACILITY CLOSURE

INTRODUCTION

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore,

provisions must be made which provide the flexibility to deal with the specific situation and project setting which will exist at the time of closure. 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, unexpected temporary closure and unexpected permanent closure.

Planned Closure

This planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unexpected Temporary Closure

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency.

Unexpected Permanent Closure

This unplanned closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes both when an owner is implementing the on-site contingency plan, and when the project owner has abandoned the project.

General Conditions for Facility Closure

Planned Closure

In order that a planned facility closure does not create adverse impacts, a closure process, that will provide for careful consideration of available options and applicable laws, ordinances, regulations, standards (LORS), and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 125 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall a) identify and discuss impacts associated with the proposed facility closure activities and 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, b) identify any facilities or equipment intended to remain on site after closure and the reason, and any future use, and c) address conformance of the plan with all applicable LORS, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

The project owner shall not commence facility closure activities, with the exception of measures to eliminate any immediate threats to health and safety or the environment, until Energy Commission approval of the facility closure plan is obtained.

Unexpected Temporary Closure

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may recommend 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 temporary 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 and removal 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, Transmission Line Engineering and Waste Management).

In the event of an unexpected 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 circumstances and expected duration of the closure.

If it is determined that a temporary closure is likely to be permanent or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be submitted to the CPM within 90 days of the determination (or other period of time agreed to by the CPM).

UNEXPECTED PERMANENT CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected permanent facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner (even in an abandonment scenario).

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may recommend 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, 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, Transmission Line Engineering and Waste Management**). Furthermore, the 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 unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, 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.

DELEGATE AGENCIES

To the extent permitted by law, the Energy Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a condition of certification. If a delegate agency does not participate in this program, the Energy Commission staff will establish an alternative method of verification and enforcement. Energy Commission staff reserves the right to independently verify compliance.

In performing construction and operation monitoring of the project, the Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for

enforcing codes, the responsibility for code interpretation where required, and the authority to use discretion as necessary, in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code, sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure are described below:

Informal Dispute Resolution Procedure

The following procedure is designed to informally resolve disputes concerning interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other person, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any person including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all persons involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via

the complaint and investigation process. The procedure for informal dispute resolution is as follows:

REQUEST FOR INFORMAL INVESTIGATION

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

REQUEST FOR INFORMAL MEETING

In the event that either the person requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either person may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

- immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
- secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary; and
- 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.

After the conclusion of such a meeting, the CPM shall promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum that fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's Chief Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, STAFF CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; 3) transfer ownership or operational control of the facility; or 4) change a condition verification requirement.

A petition is required for **amendments** and for **insignificant (staff) changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209. The criteria that determine which type of change process applies are explained below.

Amendment

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol (and in some cases the verification) portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

Insignificant Staff Change

The proposed change will be processed as an insignificant staff change if it does not require changing the language in a condition of certification, does not have a potential significant environmental impact, and will not cause the project to violate laws, ordinances, regulations or standards.

Verification Change

The proposed change will be processed as a verification change if it involves only the language in the verification portion of the condition of certification. This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the unlikely event

that verification language contains technical requirements, the proposed change must be processed as an amendment.

KEY EVENT LIST

PROJECT _____ DATE ENTERED

DOCKET # _____ PROJECT MANAGER

EVENT DESCRIPTION	***DATE ASSIGNED***
Date of Certification	
Start of Construction	
Completion of Construction	
Start of Operation (1st Turbine Roll)	
Start of Rainy Season	
End of Rainy Season	
Start T/L Construction	
Complete T/L Construction	
Start Fuel Supply Line Construction	
Complete Fuel Supply Line Construction	
Start Rough Grading	
Complete Rough Grading	
Start of Water Supply Line Construction	
Complete Water Supply Line Construction	
Start Implementing Erosion Control Measures	
Complete Implementing Erosion Control Measures	

GLOSSARY OF TERMS AND ACRONYMS

A

A	Ampere
AAL	All aluminum (electricity conductor)
AADT	Annual Average Daily Traffic
AAQS	Ambient Air Quality Standards
ABAG	Association of Bay Area Governments
AC	Alternating Current
ACEC	Area of Critical Environmental Concern
ACGIH	American Conference of Government and Industrial Hygienists
ACE	Army Corps of Engineers
ACSR	Aluminum Covered Steel Reinforced (electricity conductor)
AFC	Application for Certification
AFY	acre-feet per year
AHM	Acutely Hazardous Materials
AIHA	American Industrial Hygienists Association
ANSI	American National Standards Institute
APCD	Air Pollution Control District
APCO	Air Pollution Control Officer
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	Air Resources Board
ARCO	Atlantic Richfield Company
ASAE	American Society of Architectural Engineers
ASHRAE	American Society of Heating Refrigeration & Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ATC	Authority to Construct
AWS	American Welding Society

B

BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
BAF	Basic American Foods
BARCT	Best Available Retrofit Control Technology
bbl	barrel
BCF	billion cubic feet
Bcfd	billion cubic feet per day
b/d	barrels per day
BO	Biological Opinion
BLM	Bureau of Land Management

BR	Biennial Report
BRMIMP	Biological Resources Mitigation and Monitoring Plan
Btu	British thermal unit

C

CAA	U.S. Clean Air Act
CAAQS	California Ambient Air Quality Standards
CALEPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety and Health Administration
CA-PX	California Power Exchange
CALTRANS	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CATEF	California Toxic Emissions Factors
CBC	California Building Code
CBO	Chief Building Official
CCAA	California Clean Air Act
CDF	California Department of Forestry
CDFG	California Department of Fish and Game
CEERT	Coalition for Energy Efficiency and Renewable Technologies
CEM	Continuous Emissions Monitoring
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CESA	California Endangered Species Act
CFB	Circulating Fluidized Bed
CFCs	Chloro-fluorocarbons
Cfm	cubic feet per minute
CFR	Code of Federal Regulations
cfs	cubic feet per second
CLUP	Comprehensive Land Use Plan
CNEL	Community Noise Equivalent Level
CNLM	Center for Natural Lands Management
CO	Carbon Monoxide
CO2	Carbon Dioxide
COC	Condition of Certification
COI	California Oregon Intertie
CPCN	Certificate of Public Convenience & Necessity
CPM	Compliance Project Manager

CPUC	California Public Utilities Commission
CRTR	Cultural Resources Technical Report
CT	Combustion Turbine Current Transformer
CTG	Combustion Turbine Generator
CUPA	Certified Unified Program Agency
CURE	California Unions for Reliable Energy

D

dB	decibel
dB(A)	decibel on the A scale
DC	Direct Current
DCS	Distributed Control System
DCTL	Double Circuit Transmission Line
DDWTF	Delta Diablo Wastewater Treatment Facility
DDSD	Delta Diablo Sanitation District
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
DFG	California Department of Fish and Game
DHS	California Department of Health Services
DOC	Determination of Compliance
DOE	(U.S.) Department of Energy
DOG	(California) Department of Oil and Gas
DSM	Demand Side Management
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources

E

EDF	Environmental Defense Fund
EDR	Energy Development Report
EEGL	Emergency Response Planning Guidelines
EFS&EPD	Energy Facilities Siting and Environmental Protection Division
EIA	(U.S.) Energy Information Agency
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJ	Environmental Justice
ELFIN	Electric Utility Financial and Production Simulation Model
EMF	Electric And Magnetic Field
EOR	East of River (Colorado River)

EPA	(U.S.) Environmental Protection Agency
EPA-ARI	(U.S.) Environmental Protection Agency-Accidental Release Information Program
EPRI	Electric Power Research Institute
ER	Electricity Report
ERC	Emission Reduction Credit {offset}
ERNS	Emergency Response Notification System
ERPG	Emergency Response Planning Guidelines
ESA	Endangered Species Act (Federal) Environmental Site Assessment
ETSR	Energy Technologies Status Report

F

FAA	Federal Aviation Administration
FBE	Functional Basis Earthquake
FCAA	Federal Clean Air Act
FCC	Federal Communications Commission
FEIR	Final Environmental Impact Report
FERC	Federal Energy Regulatory Commission
FIP	Federal Implementation Plan
FLPMA	Federal Land Policy Management Act
FONSI	Finding of No-Significant Impact
FP	(State) Fully Protected
FSA	Final Staff Assessment
FT	Federally (listed) Threatened

G

GE	General Electric
GEP	Good Engineering Practice
GIS	Gas Insulated Switchgear Geographic Information System
gpd	gallons per day
gpm	gallons per minute
GW	gigawatt
GWh	gigawatt hour

H

H_2S	Hydrogen Sulfide
HCP	Habitat Conservation Plan
HHV	Higher Heating Value
HRA	Health Risk Assessment
HRSG	Heat Recovery Steam Generator
HV	High Voltage
HVAC	Heating, Ventilation and Air Conditioning

I

IAR	Issues and Alternatives Report
IDLH	Immediately Dangerous to Life and Health Level
IEA	International Energy Agency
IEEE	Institute of Electrical & Electronics Engineers
IIPP	Injury and Illness Prevention Program
IIR	Issues Identification Report
IMPLAN	Impact Analysis for Planning
IOU	Investor-Owned Utility
IS	Initial Study
ISO	Independent System Operator
ISCST3	Industrial Source Complex Short-Term model, Version 3

J

JES	Joint Environmental Statement

K

KCM	thousand circular mils (also KCmil) (electricity conductor)
KGRA	Known Geothermal Resource Area
km	kilometer
KOP	Key Observation Point
kV	kilovolt
KVAR	kilovolt-ampere reactive
kW	kilowatt
kWe	kilowatt, electric
kWh	kilowatt hour
kWp	peak kilowatt

L

LAER	Lowest Achievable Emission Rate
lbs	pounds
lbs/hr	pounds per hour
lbs/MMBtu	Pounds Per Million British Thermal Units
LORS	Laws, Ordinances, Regulations and Standards
LOS	Level of Service

M

m (M)	meter, million, mega, milli or thousand
MCE	Maximum Credible Earthquake
MCF	thousand cubic feet
MCL	Maximum Containment Level
MCM	thousand circular mil (electricity conductor)
$\mu g/m^3$	micro grams (10-6 grams) per cubic meter
MG	milli gauss

mgd	million gallons per day
MOU	Memorandum of Understanding
MPE	Maximum Probable Earthquake
m/s	meters per second
MS	Mail Station
MVAR	megavolt-ampere reactive
MW	megawatt (million watts)
MWh	megawatt hour
MWp	peak megawatt

N

N-1	One transmission circuit out
N-2	Two transmission circuits out
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Council
NCR	Non-Conformance Report
NEC	National Electrical Code
NEPA	National Energy Policy Act National Environmental Policy Act
NERC	National Electric Reliability Council
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Health and Safety
NMHC	nonmethane hydrocarbons
NO	nitrogen oxide
NOI	Notice of Intention
NOL	North of Lugo
NO_x	nitrogen oxides
NO2	nitrogen dioxide
NOP	Notice of Preparation (of EIR)
NOV	Notice of Violation
NRC	National Research Council National Response Center
NRDC	Natural Resources Defense Council
NSPS	New Source Performance Standards
NSR	New Source Review

O

O_3	Ozone
OASIS	Open Access Same-Time Information System
OCB	Oil Circuit Breaker
OCSG	Operating Capability Study Group
O&M	Operation and Maintenance
OLM	Ozone Limiting Method
OSHA	Occupational Safety and Health Administration (or Act)

P

PAH	Polycyclic Aromatic Hydrocarbons
PG&E	Pacific Gas & Electric Company
PDCI	Pacific DC Intertie
PHC(S)	Prehearing Conference (Statement)
PIFUA	Federal Powerplant & Industrial Fuel Use Act of 1978
PM	particulate matter
PMPD	Presiding Member's Proposed Decision
PM_{10}	Particulate matter 10 microns and smaller in diameter
$PM_{2.5}$	Particulate matter 2.5 microns and smaller in diameter
PPE	Personal Protective Equipment
ppb	parts per billion
ppm	parts per million
ppmvd	parts per million by volume, dry
ppt	parts per thousand
PSA	Preliminary Staff Assessment
PRC	(California) Public Resources Code
PSD	Prevention of Significant Deterioration
PT	Potential Transformer
PTO	Permit to Operate Participating Transmission Owner
PU	per unit
PURPA	Federal Public Utilities Regulatory Policy Act of 1978
PV	Palo Verde photovoltaic
PX	Power Exchange

Q

QA/QC	Quality Assurance/Quality Control
QF	Qualifying Facility

R

RACT	Reasonably Available Control Technology
RCRA	Resource Conservation and Recovery Act
RDF	Refuse Derived Fuel
RE	Resident Engineer
RMP	Risk Management Plan
ROC	Report of Conversation Reactive Organic Compounds
ROG	Reactive Organic Gas
ROW	Right-of-Way

RWQCB	Regional Water Quality Control Board

S

SARA	Superfund Amendments and Reauthorization Act of 1986
SB	Senate Bill
SCAB	South Coast Air Basin
SCE	Southern California Edison Company
SCFM	standard cubic feet per minute
SCH	State Clearing House
SCIT	Southern California Import Transmission
SCR	Selective Catalytic Reduction
SCTL	Single Circuit Transmission Line
SE	State (listed) Endangered
SHPO	State Office of Historic Preservation
SIC	Standard industrial classification
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SMP	Safety Management Plan
SNCR	Selective Noncatalytic Reduction
SNG	Synthetic Natural Gas
SO_2	Sulfur Dioxide
SO_x	Oxides of Sulfur
SO_4	Sulfates
SSC	Species of Special Concern
ST	State (listed) Threatened
STEL	Short Term Exposure Limit
STPEL	Short Term Public Emergency Limit(s)
STIG	Steam Injected Gas Turbine
SWP	State Water Project
SWRCB	State Water Resources Control Board

T

TAC	Toxic Air Contaminant
Tbtu	trillion Btu
TCF	trillion cubic feet
TCM	Transportation Control Measure
TDS	Total Dissolved Solids
TE	Transmission Engineering
TEOR	Thermally Enhanced Oil Recovery
TL T-Line	Transmission Line (or lines Transmission Line
TLV	Threshold Limit Value
TOG	Total Organic Gases

TPD	tons per day
TPY	tons per year
TS&N	Transmission Safety and Nuisance
TSE	Transmission System Engineering
TSIN	Transmission Services Information Network
TSP	Total Suspended Particulate Matter

U

UBC	Uniform Building Code
UDC	Utility Displacement Credits
UDF	Utility Displacement Factor
UEG	Utility Electric Generator
UFC	Uniform Fire Code
USC(A)	United States Code (Annotated)
USCOE	U.S. Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

V

VOC	Volatile Organic Compound(s)
VRM	Visual Resource Management

W

W	Watt
WAA	Warren-Alquist Act
WEPEX	Western Energy Power Exchange
WHO	World Health Organization
WICF	Western Interconnection Forum
WIEB	Western Interstate Energy Board
WRTA	Western Region Transmission Association
WSCC	Western System Coordination Council
WSPP	Western System Power Pool

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