

Preliminary Staff Assessment

# HUMBOLDT BAY REPOWERING PROJECT

Application For Certification (06-AFC-7)  
Humboldt County



**CALIFORNIA  
ENERGY  
COMMISSION**

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**STAFF REPORT**

**NOVEMBER 2007  
(06-AFC-7)  
CEC-700-2007-020-PSA**



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**HUMBOLDT BAY REPOWERING PROJECT  
(06-AFC-7)  
PRELIMINARY STAFF ASSESSMENT**

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# EXECUTIVE SUMMARY

John S. Kessler

## INTRODUCTION

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This Preliminary Staff Assessment (PSA) contains the California Energy Commission staff's independent evaluation of the Humboldt Bay Repowering Project (HBRP) Application for Certification (06-AFC-7). The PSA examines engineering, environmental, public health and safety aspects of the HBRP, based on the information provided by the applicant, Pacific Gas and Electric Company (PG&E), and other sources available at the time the PSA was prepared. The PSA contains analyses similar to those normally contained in an Environmental Impact Report (EIR) required by the California Environmental Quality Act (CEQA). When issuing a license, the Energy Commission is the lead state agency under CEQA, and its process is functionally equivalent to the preparation of an EIR. After a 30-day public comment period on the PSA, staff will prepare its Final Staff Assessment (FSA).

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

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

## PROJECT LOCATION AND DESCRIPTION

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The proposed HBRP site would be located at 1000 King Salmon Avenue, Eureka, California. This project will be located on 5.4 acres within a 143-acre parcel currently occupied by the existing PG&E Humboldt Bay Power Plant. The HBRP will be a load following power plant consisting of ten (10) natural gas-fired Wärtsilä 18V50DF 16.3 megawatt (MW) reciprocating engine-generator sets and associated equipment with a combined nominal generating capacity of 163 MW. The HBRP will also be capable of running on California Air Resources Board (CARB)-certified diesel fuel in order to ensure local area reliability during instances of natural gas curtailment in the region as required by the California Public Utilities Commission (CPUC) and PG&E's CPUC Gas Tariff Rule 14. This project is a replacement of the existing 105 MW Units 1 and 2 and

the two 15 MW Mobile Emergency Power Plants (MEPP) at PG&E's Humboldt Bay Power Plant site. **Project Description Figures 1 and 2** shows the regional and local settings for the proposed project respectively.

The power plant site is currently zoned coastal dependent industrial with combining district designations for coastal resource dependent, flood hazard and coastal wetland. The site is within the jurisdiction of the California Coastal Commission and Humboldt County. Land uses and natural features on the project parcel include industrial land, power plant cooling water intake and discharge canals, wetlands, and Buhne Slough. The property is bounded on the north by Humboldt Bay, on the west by the King Salmon community, on the east by Northwestern Pacific Railroad tracks, and on the south by King Salmon Avenue. Land uses surrounding the site include Highway 101, some rural residential, commercial development, wetland areas, the Humboldt Hill residential development, the community of Fields Landing, Humboldt Bay, a sand spit (South Spit) and the Pacific Ocean. An existing public trail that is part of the California Coastal Trail system is on the north side of the Humboldt Bay Power Plant site along Humboldt Bay.

Buhne Slough is a local fishing area, and follows the south-eastern boundary of developments within the HBPP site. The Elk River Wildlife Area is approximately 2,000 feet to the northeast of the HBRP site. Within a one-mile radius of the HBRP site are South Bay Elementary School and a senior home, Sun Bridge Seaview Care Center, and two churches, the Redwood Christian Center and the Calvary Community Church.

Air emissions from the proposed facility would be controlled using best available control technology applied to each engine's exhaust. Each system would consist of a selective catalytic reduction unit for oxides of nitrogen (NOx) control and an oxidation catalyst unit for carbon monoxide (CO) and volatile organic compounds (VOC) control. In order to be considered for licensing by the Energy Commission, the project would be required to conform with rules and regulations of the North Coast Unified Air Quality Management District (NCUAQMD) and be issued a Determination of Compliance from NCUAQMD.

The HBRP proposes using approximately 2,400 gallons of water per day (2.7 acre-feet/year) on average for cooling or other industrial purposes, which is a fraction of the water required for traditional combined-cycle turbine design. The generators will use an air radiator cooling system in a closed loop system (similar to automobiles). Raw water for industrial processes and site landscape irrigation will be supplied from PG&E's existing ground water well via a direct connection to an onsite 6-inch-diameter water pipeline. Domestic water required for non-process uses (i.e., sinks, toilets, showers, drinking fountains, eye wash/safety showers, etc.) will be provided from a new 4- to 6-inch-diameter on-site pipeline running 1200 feet to a connection with the existing HCSD line that runs along King Salmon Avenue. The HBRP will discharge industrial and sanitary wastewater into the Humboldt Community Services District (HCSD) sanitary sewer system at an average rate of about 860 gallons per day.

The project would be connected from the generators to the existing switchyard via two 60 kilovolt (kV) tie lines and one 115-kV tie line. No new transmission lines will be required. Natural gas would be supplied to the HBRP via an onsite 10-inch-diameter, high-pressure, natural gas pipeline owned and operated by PG&E.

## **PUBLIC AND AGENCY COORDINATION**

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On October 12, 2006, the Energy Commission staff provided the HBRP project description to a comprehensive list of libraries, agencies, organizations and residences/business within 1,000 feet of the proposed project and 500 feet of the linear facilities. The Commission staff's notification letter requested public and agency review, comment, and continued participation in the Energy Commission's certification process.

On December 18, 2006, an Information Hearing and a Site Visit for the HBRP were conducted at the Humboldt Bay Power Plant (HBPP) near the city of Eureka. Staff has conducted two publicly noticed Data Response and Issue Resolution staff workshops at the HBPP. The first of these was held on February 1, 2007, and discussed the topics of Air Quality, Biology, Cultural Resources, Geology, Hazardous Materials, Public Health, Soil and Water Resources, Transmission System Engineering, Waste Management and Worker Safety/Fire Protection. Participating agencies in the first workshop included the applicant, PG&E, Humboldt County, North Coast Unified Air Quality Management District (NCUAQMD) and the California Air Resources Board (CARB). The second workshop was conducted on March 12, 2007, and discussed the topics of Air Quality and Public Health. Participating agencies in the second workshop included the applicant, PG&E, Humboldt County, NCUAQMD and CARB. In addition to this workshop, extensive coordination has also occurred with numerous other local, state and federal agencies that have an interest in the project including the city of Eureka, Humboldt County, California Coastal Commission (Coastal Commission), California Department of Fish and Game (CDFG), U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service (USFWS) and the U.S. Environmental Protection Agency (USEPA). Staff has also considered the comments of community groups and individual members of the public.

## **ENVIRONMENTAL JUSTICE**

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

The purpose of staff's environmental justice screening analysis is to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in USEPA's National

Environmental Protection Act Compliance Analysis” (Guidance Document) dated April 1998. People of color populations, as defined by this Guidance Document, are identified where either:

- the minority population of the affected area is greater than fifty percent of the affected area’s general population; or
- the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

There is not a minority population greater than 50 percent that has been identified within a six-mile radius of the HBRP site. Staff has identified a significant direct adverse impact in the Public Health section of the PSA and has evaluated it for environmental justice screening. Lacking a minority population greater than 50 percent, the construction and operation of the HBRP is not considered to have a disproportional impact on an environmental justice population. Staff has worked closely with PG&E and the residents of the area to identify local mitigation measures designed to reduce to the greatest extent possible any impact that will occur in the community surrounding the proposed project. Staff’s environmental justice outreach has been incorporated into its overall outreach activity facilitated by the Energy Commission’s Public Advisor’s Office. This activity is summarized in the **Introduction** to the PSA.

## **STAFF’S ASSESSMENT**

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Each technical area section of the PSA contains a discussion of the project setting, impacts, and where appropriate, mitigation measures and proposed conditions of certification. The PSA includes staff’s assessment of:

- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- environmental impacts, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project closure;
- project alternatives;
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation;
- environmental justice for minority and low income populations;
- proposed conditions of certification; and
- recommendation on project approval or denial.

## **COASTAL ACT CONFORMANCE**

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Under normal circumstances, the Coastal Commission would make its own determination as to the project's conformance with the California Coastal Act (Coastal Act). Although the Coastal Commission was able to participate in review of the project during earlier activities of the Energy Commission's licensing process, due to its workload, it had to withdraw from participating in several projects undergoing licensing before the Energy Commission, including the HBRP. The Coastal Commission's position was expressed in a letter dated October 16, 2007 from Peter McDouglas, Executive Director of the Coastal Commission to B.B. Blevins, Executive Director of the Energy Commission. Considering these circumstances, the Coastal Commission requested, and the Energy Commission has accepted responsibility for making a determination of the HBRP's conformance with the Coastal Act, similar to the Energy Commission's role in considering conformance with other LORS. Staff's preliminary recommendations to the Energy Commission for determining conformance with the Coastal Act are included in the several technical areas of this PSA where applicable sections of the Coastal Act are pertinent to the HBRP. These PSA sections include Biology, Geology, Land Use, Soil and Water and Visual Resources. The evaluation of HBRP's conformance to the Coastal Act for Biological Resources was not included in this PSA, but will be addressed in the Final Staff Assessment (FSA).

## **SUMMARY OF PROJECT RELATED IMPACTS**

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Staff concludes that based on its preliminary health risk assessment, that the HBRP could cause a significant cancer risk to public health and would not conform with related LORS. The potential health risk is associated with HBRP's proposed use of diesel fuel as a backup during natural gas curtailments to the use of natural gas with a diesel pilot as the normal source of fuel for the reciprocating engine-generator units. In addition, staff is unable to make determinations as to whether the project would conform with all applicable laws, ordinances, regulations, and standards (LORS) in the areas of Air Quality, Biology, and Land Use or if there would be significant adverse impacts in Air Quality. The potential public health risk also has the effect to cause land use non-conformity under Humboldt County's Humboldt Bay Area Plan as a cancer risk would not be compatible with adjacent land uses that are occupied by residences. With the exception of these three technical areas, staff believes that as currently proposed, including the applicant's and the staff's proposed mitigation measures and the staff's proposed conditions of certification, the HBRP project for all other technical areas would not cause a significant adverse impact and would comply with all applicable laws, ordinances, regulations, and standards (LORS). For a more detailed review of potential impacts, see staff's technical analyses in the PSA. The status of each technical area is summarized in the table below.

The discussion following the table identifies the technical areas in the PSA that staff has identified as having outstanding issues, that in order to resolve, require either additional data, further discussion and analysis or are awaiting conditions from a permitting agency prescribing mitigation.

<b>Technical Area</b>	<b>Complies with LORS</b>	<b>Impacts Mitigated</b>
Air Quality	<b>Unresolved</b>	<b>Unresolved</b>
Biological Resources	<b>Unresolved</b>	Yes
Cultural Resources	Yes	Yes
Efficiency	Not Applicable	Not Applicable
Facility Design	Yes	Yes
Geology & Paleontology	Yes	Yes
Hazardous Materials	Yes	Yes
Land Use	<b>Unresolved</b>	Yes
Noise	Yes	Yes
Public Health	<b>No</b>	<b>No</b>
Reliability	Not Applicable	Not Applicable
Socioeconomic Resources	Yes	Yes
Soil & Water Resources	Yes	Yes
Traffic & Transportation	Yes	Yes
Transmission Line Safety/Nuisance	Yes	Yes
Transmission System Engineering	Yes	Yes
Visual Resources	Yes	Yes
Waste Management	Yes	Yes
Worker Safety and Fire Protection	Yes	Yes

## **AIR QUALITY**

Staff cannot conclude that PG&E's proposed Humboldt Bay Repowering Project (HBRP) would be likely to conform with applicable federal, state and North Coast Unified Air Quality Management District (NCUAQMD) air quality laws, ordinances, regulations and standards (LORS), which precludes staff from making a determination as to whether HBRP would result in significant air quality-related impacts.

Staff has identified proposed conditions of certification, but many issues remain either unresolved or lack complete analysis. Staff finds the following:

- PG&E has not proposed any annual limit on the number of hours of operation in diesel mode, except for 50 hours/year/engine for maintenance and testing, because PG&E states that a natural gas supply curtailment is an "emergency." However, Energy Commission staff and the NCUAQMD both seek to limit the hours of operation in diesel mode because the potential emissions of the project need to be clearly defined. The NCUAQMD has determined that the project should be limited to 1,000 engine-hours per year in the diesel mode.
- PG&E seeks the flexibility to operate the HBRP during natural gas curtailments, which are determined by gas supply constraints while the transmission grid operators may dictate when the plant must operate. However, HBRP would need to remain within fuel use and emission limits established by NCUAQMD. There is a potential for the power plant to violate NCUAQMD limits if actual fuel use or emissions occur at or near the maximum anticipated levels or if HBRP is forced by grid operators to be online during lengthy or severe natural gas curtailments.

- If the project is allowed to fire diesel fuel beyond 50 hours per engine per year, and the natural gas curtailment is not considered an emergency under the definition in Title 17 Code of California Regulations (CCR) 93115.4(a)(30) by the regulatory agencies, then the project would be in violation of diesel particulate matter limit standards of Title 17 CCR 93115.6 (a)(3)(A)2.
- The NCUAQMD's Preliminary Determination of Compliance (PDOC) included a review of emission control technologies that does not include an analysis of the cost-effectiveness of various control technologies, namely diesel particulate filters or alternative fuels.
- The applicant's offset package for the HBRP is based on actual emission reductions including historic emissions from the Humboldt Bay Power Plant (HBPP) that may have occurred during emergency use of the HBPP. If natural gas curtailment is defined as emergency use for this project (for both the HBPP and the HBRP), then the applicant's approach overestimates the emission reductions and underestimates the offset requirements.
- The PDOC included ambient air quality impacts caused by the project, but the visibility analysis and analysis of whether particulate matter emissions would comply with federal increment consumption requirements was not available at the time of the NCUAQMD review. For the visibility analysis, the agencies responsible for determining compliance (the U.S. Forest Service and the National Park Service) analyzed only the 50 hours/engine annual usage, not the up to 100 hours/engine annual usage. Thus those agencies will need to re-address the issue of compliance with federal visibility requirements.

To address issues related to conforming with LORS, staff has provided a PDOC public comment letter and recommendations that the NCUAQMD can take as part of its ongoing review of the project. Additionally, Energy Commission staff has advised the NCUAQMD that air quality impacts could be reduced with the use of a backup fuel other than diesel or use of an add-on control device to reduce diesel particulate matter.

## **BIOLOGY**

The Humboldt Bay Repowering Project (HBRP) site is located on the same parcel of land as the existing Humboldt Bay Power Plant, three miles south of the city of Eureka in Humboldt County. The HBRP will impact United States Army Corps of Engineers (USACE) jurisdictional wetlands and California Coastal Commission (Coastal Commission) wetlands. In addition, the HBRP has the potential to impact special-status plant and animal species known to occur in the project vicinity; however, compliance with Section 404 of the federal Clean Water Act, the biological resources Conditions of Certification, and other laws, ordinances, regulations, and standards (LORS) discussed in the staff analysis would likely mitigate impacts to biological resources from the HBRP. Additional Conditions of Certification or modifications to currently proposed Conditions of Certification may be necessary based on further consultation with agency personnel, information provided prior to completion of staff's Final Staff Assessment, and staff's Coastal Act conformance analysis. Staff is unable to make a final recommendation regarding the HBRP due to its pending review of Coastal Commission documents regarding compliance with the Coastal Act.

## LAND USE

Pursuant to §30413(d) of the California Coastal Act (Coastal Act), Energy Commission staff acting on behalf of Coastal Commission staff concludes that the Humboldt Bay Repowering Project (HBRP) is consistent with the Coastal Act and Humboldt County's zoning designations, zoning code, and is consistent with all but one of the relevant policies of the Humboldt Bay Area Plan (HBAP). Goal 3.14B1/Objective 30232 of the HBAP states 'Industrial uses shall include mitigation and design features for compatibility with adjacent land uses ...'. Despite the increased stack height to improve air dispersion characteristics (as explained in the **AIR QUALITY** section of this document), there is an unresolved Public Health issue and staff cannot fully determine the project is compatible with adjacent land uses. With the exception of unresolved air quality and public health issues, the project would be compatible with existing and planned land uses and would not abut any zoned residential areas, or impact farmland or other agricultural areas.

## PUBLIC HEALTH

Staff has analyzed potential public health risks associated with construction and operation of HBRP. Given the information provided by the project applicant on the emission factors for the toxic air contaminants that would be emitted from the ten Wärtsilä engines when burning diesel fuel and using EPA-approved modeling, staff has found that the risk of cancer would be 29.1 in a million. This is considerably above the level of significance (10 excess cancers in one million with the use of Toxics-Best Available Control Technology -- T-BACT) used by staff in all power plant siting cases. In the numerous other in-state power plant proposals reviewed by staff, staff has not seen cancer risks above this level of significance. The applicant has also estimated the cancer risk to be 10.7 in one million which would also be above the level of significance considering the same scenario as analyzed by staff. Staff also concludes that no acute (short-term) or chronic (long-term) non-cancer health impacts would be expected to occur to any members of the public including low income and minority populations.

Staff believes that there are several options that the applicant should pursue to reduce the risk to the public to below the level of significance. They are:

1. Reduce diesel particulate emissions from the stacks with post-combustion controls such as diesel particulate filters or catalysts;
2. Use alternative fuels such as compressed natural gas stored on-site, or compressed or liquefied natural gas or propane stored at another location; or
3. Use alternative technologies such as combustion turbines that could change flue gas parameters to reduce modeled impacts.

## ALTERNATIVES SUMMARY

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The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulation, Section 15126.6(a), provides direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the

project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project.” In addition, the analysis must address the “no project” alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

Staff has explored a range of reasonable alternatives to the HBRP, or to its location, examining if there are any alternatives which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen the significant cancer risk that could result from the project as concluded from staff’s preliminary analysis.

1. Reduce diesel particulate emissions from the stacks with post-combustion controls such as diesel particulate filters or catalysts;
2. Use alternative fuels to the proposed use of diesel fuel such as compressed or liquefied natural gas or liquefied propane stored on-site, or compressed and/or liquefied natural gas or propane stored at another location; or
3. Use alternative technologies such as combustion turbines and combined cycle (combustion turbines and a steam turbine) that could change flue gas parameters to reduce modeled impacts.

Staff is unable to make any conclusions at this time as to whether there are any environmentally superior alternatives to the proposed HBRP, and intends to further explore alternatives that could avoid or substantially lessen the project’s cancer risk prior to preparing the Final Staff Assessment.

Eight alternative sites were reviewed. Although there are appropriately zoned sites that are not located near sensitive receptors or sensitive environmental resources, none of these alternative sites are located as favorably near to electrical transmission and natural gas infrastructure as is the HBRP at the existing HBPP site. While all of these alternative sites are served by 60-kV transmission, the existing service is not designed for loads that would be required to export power from the HBRP. Each of the alternative sites considered is located more than 10 miles from the nearest 115-kV transmission line (the nearest, Palco Fortuna, is 13.3 miles; the farthest, Palco Scotia, is 21.2 miles). Construction of a new generation tie-line to serve any of these alternative sites with 115-kV transmission would require several miles of new right-of-way, much of it in the Coastal Zone. In order to supply the Humboldt load pocket in the manner that is required, a new 115-kV transmission line would likely need to interconnect at either the Humboldt Substation located in Eureka or at the existing HBPP substation. The cost of building this line would be very high and potential environmental impacts include loss of wetlands and endangered species habitat, as well as visual resources impacts. In addition to requiring the construction of a 115-kV generation tie-line, the two Samoa Peninsula alternative sites would require construction of more than 7 miles of natural gas pipeline. While much of this construction would be placed in existing roadway utility corridors, connection with the existing natural gas trunk line near US-101 in Arcata would require horizontal directional drilling under several major waterways that drain into the north end of Arcata Bay, running the risk of damaging sensitive fish and invertebrate habitat. Due to the unknown costs of transmission right-of-way acquisition, design, construction, and environmental mitigation, and undetermined environmental

effects at this time, staff cannot conclude if any of the alternative sites would be environmentally superior.

Alternative renewable technologies (i.e., solar, geothermal, wind, biomass, and hydroelectric) were examined as possible alternatives to the project. Solar, geothermal and hydroelectric alternatives were determined not to be a viable option, as there are not adequate resources located near the city of Eureka. While wind power likely is a feasible alternative, it would not meet the project objective to provide a reliable source of generation within the Humboldt Load Pocket. Wind power would be subject to climatic patterns when wind is available. Biomass power could not meet the project objective to be capable of rapid-response loading in order to maintain service during transmission interruptions and natural gas curtailments. The steam turbine technology associated with most biomass power systems are more suited for base loads, are less efficient than the proposed HBRP, and would likely have higher air emissions. Since an objective of the project is to provide 163 MW of electricity with minimal impacts to the environment and provide the public with an efficient, reliable source of electrical power, staff concludes the alternative renewable technologies examined are not feasible.

Staff also examined non-renewable technologies using fossil fuel such as simple and combined cycle turbine arrangements. These types of technologies were also included in the proposals PG&E received in its solicitation of a Long-Term Request for Offer to replace the existing HBPP. Staff believes these technologies would meet the project objectives, and will be considering these alternatives further for the FSA as it explores options for mitigating the significant impact to public health.

Staff also believes that the “No Project Alternative” is not superior to the proposed project. The No Project scenario would likely delay replacement of the existing HBPP with more energy efficient electrical resources required for the Humboldt load pocket, and could impact electrical supply reliability in northern California.

Staff is unable to make any conclusions at this time as to whether there are any environmentally superior alternatives to the proposed HBRP, and intends to further explore alternatives that could avoid or substantially lessen the project’s cancer risk prior to preparing the Final Staff Assessment.

## **NOTEWORTHY PUBLIC BENEFITS**

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The HBRP would offer the following public benefits:

1. Replace the existing Humboldt Bay Power Plant Units 1 and 2, which are about 50 years old and nearing the end of their useful lives, with a 30% more efficient generation technology.
2. Locate the HBRP at the existing HBPP near existing infrastructure which avoids potential environmental impacts from new linear facilities. HBRP would be located adjacent to an existing substation, providing key interconnections to both the existing 60-kilovolt (kV) and 115-kV transmission lines, and infrastructure for natural gas, water supply, and wastewater disposal.

3. Provide a reliable source of generation within the Humboldt Load Pocket (greater Humboldt County area), where imported power is normally constrained to supply only about half of the existing 196-MW peak load.
4. Be capable of rapid-response loading in order to maintain service during transmission interruptions and natural gas curtailments.
5. Reduce and ultimately eliminate the quantity of water withdrawn from Humboldt Bay as is currently used for once-through cooling of the existing Units 1 and 2, and for the fuel rod storage of the nuclear Unit 3 which is undergoing decommissioning. At such time as HBRP would be in operation and Unit 3 decommissioned, all bay water diversions would cease and eliminate loss of aquatic marine life from entrainment and impingement in the HBPP cooling water system.
6. Reduce exhaust emissions for most air contaminants compared to the existing HBPP, particularly oxides of nitrogen (NO<sub>x</sub>), which is a precursor to ozone formation.

Staff has identified additional noteworthy public benefits as listed below.

## **SOCIOECONOMICS**

Important public benefits discussed under the fiscal and non-fiscal effects section are: capital expenditures, construction payroll, annual property taxes and sales taxes, and the value of locally purchased construction and operation equipment and materials.

## **RECOMMENDATIONS AND SCHEDULE**

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For a more detailed review of potential impacts, see staff's technical analyses in the PSA. Staff has listed the outstanding issues as applicable in the technical sections of the PSA. To resolve these issues, staff requires either additional data, further discussion and analysis, or is awaiting conditions from a permitting agency prescribing mitigation.

There is not a minority population greater than 50 percent that has been identified within a six-mile radius of the HBRP site. Staff has identified a significant direct adverse impact in the Public Health section of the PSA and has evaluated it for environmental justice screening. Lacking a minority population greater than 50 percent, the construction and operation of the HBRP is not considered to have a disproportional impact on an environmental justice population.

In conclusion, based on the information available at this time, staff can not recommend certification of the HBRP due to the potential for the project to cause a significant cancer risk to public health, and unresolved issues particularly in air quality. Staff will work to resolve the outstanding issues and to update our preliminary conclusions for the FSA. The project is being reviewed under the 12-month AFC process. Staff will conduct a public workshop on the PSA within 30 days of its publication, which has been scheduled for 10:00 AM on December 14, 2007, at the Assembly Room of Humboldt Bay Power Plant. Under the best scenario, staff anticipates publication of the Final Staff

Assessment (FSA) in either January or February 2008 subject to when the NCUAQMD issues its Final Determination of Compliance, which will address all comments on the PDOC. However, due to the complexities of the air quality and public health issues that may lead to more analysis by PG&E and the NCUAQMD, staff remains cautious that this schedule may not be realized.

# INTRODUCTION

John S. Kessler

## PURPOSE OF THIS REPORT

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

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

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

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

## **ORGANIZATION OF THE STAFF ASSESSMENT**

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

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

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

## **ENERGY COMMISSION SITING PROCESS**

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

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

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, § 1743(b)). Staff is required to coordinate with other agencies to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, § 1744(b)).

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

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

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

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

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

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. Staff's proposed description of the contents of the Compliance

Monitoring Plan and proposed General Conditions are included in the **General Conditions** section of this PSA.

## **AGENCY COORDINATION**

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

# PROJECT DESCRIPTION

John S. Kessler

## INTRODUCTION

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On September 29, 2006, Pacific Gas and Electric Company (PG&E) filed an Application for Certification (AFC) for the Humboldt Bay Repowering Project (HBRP), seeking approval from the California Energy Commission to construct and operate a nominal 163-megawatt (MW) power plant consisting of 10 dual-fueled (natural gas with a diesel pilot or diesel) reciprocating engine-generator units rated at 16.3 MW each. On November 3, 2006, PG&E filed a Supplement to the AFC, and on November 8, 2006, the Energy Commission accepted the AFC (06-AFC-7) with supplemental information as complete. This determination initiated Energy Commission staff's independent analysis of the proposed project.

## PURPOSE OF PROJECT

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The 163-MW nominal capacity HBRP is designed as a load-following and daily cycling facility to meet electric generation load and reliability requirements in PG&E's Humboldt Service Area. The project is a replacement of existing Units 1 and 2 (105-MW combined capacity) consisting of natural gas- and oil-fired steam turbine-generating units and of the two diesel-fired Mobile Emergency Power Plants (MEPPs) rated at 15 MW each for HBPP (HBPP). Units 1 and 2 are about 50 years old and operate less efficiently than modern power plant technologies. The HBRP would provide a 30 percent increase in efficiency compared to existing Units 1 and 2. HBRP would be capable of running on California Air Resources Board (ARB)-certified diesel fuel in order to ensure local area reliability during instances of natural gas curtailment in the region, which can occur frequently during winter. Humboldt Bay Service Area relies extensively on local generation resources due to power import constraints and service interruptions in the 115-kilovolt (kV) transmission system.

Due to its age and outdated technology, PG&E seeks to replace its generation capacity of the existing HBPP. The review of generation alternatives is a process subject to California Public Utilities Commission (CPUC) regulations specifying a competitive and public program as to how PG&E may procure power on behalf of its customers. The HBRP, as initially proposed by an independent developer, Ramco, is one of a number of projects submitted by participants in PG&E's 2004 Long-Term Request for Offers for new generation resources. HBRP was ultimately selected, and PG&E subsequently acquired the rights for HBRP development in consideration of the need for close coordination with existing fossil and nuclear operations at the site.

## PROJECT LOCATION

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The proposed HBRP site is located at 1000 King Salmon Avenue, approximately three miles south of the city of Eureka in an unincorporated area of Humboldt County. The project is within the sphere of influence of the city of Eureka and would be located on 5.4 acres within a 143-acre parcel currently occupied by the existing PG&E HBPP. The

site is zoned Coastal-Dependent Industrial and is within the jurisdiction of the California Coastal Commission, as well as city of Eureka and Humboldt County.

The HBRP site is located on Buhne Point, a small peninsula along Humboldt Bay, and currently contains industrial land, wetlands, Buhne Slough, and cooling water intake and discharge canals associated with the existing HBPP. The property is bounded on the north by Humboldt Bay, on the west by the King Salmon community, on the east by the Northwestern Pacific Railroad tracks, and on the south by King Salmon Avenue. East of the railroad property are Highway 101, some rural parcels, and commercial development. South of King Salmon Avenue are wetland areas and the Humboldt Hill residential development. Southwest of Humboldt Hill is the community of Fields Landing. West of the King Salmon community are Humboldt Bay, a sand spit known as South Spit, and beyond the spit, the Pacific Ocean. Within a one-mile radius of the project is the South Bay Elementary School and a senior home, the Sun Bridge Seaview Care Center (PG&E 2006a, pp. 8.6-1 and 8.6-2).

A shoreline trail maintained by PG&E and the Humboldt Bay Harbor Recreation and Conservation District runs along the shoreline on the perimeter of the HBPP property to the northwest. This portion of the trail extends from the King Salmon community south to the wetlands along the bay. This trail represents part of a planned coastal trail system that the California Coastal Conservancy envisions would eventually extend from Oregon to Mexico (PG&E 2006a, p. 8.13-6)

**Project Description Figure 1** shows the regional setting, and **Project Description Figure 2** provides the local setting for the proposed project.

## **POWER PLANT EQUIPMENT AND LINEAR FACILITIES**

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In order to construct the HBRP, it would be necessary to remove several structures associated with the existing HBPP, including the painting and sandblasting building, two storage sheds, one 115-kV transmission tower, diesel fuel tanks, and related underground piping and infrastructure (PG&E 2006a, p. 2-1). The HBRP would consist of 10 dual-fuel Wärtsilä 18V50DF 16.3-MW reciprocating engine-generator sets and associated equipment with a combined nominal generating capacity of 163 MW. The reciprocating engine is very similar to a conventional automobile engine, containing 18 cylinders in a V-formation. During normal operation, the engines use natural gas as fuel, with a very small amount of diesel fuel injected through a micro-pilot system to ignite the natural gas in the cylinders. During times of natural gas disruption or curtailment, the engines use diesel fuel supplied through a separate, conventional injection system. The dual-fuel technology is capable of operating at up to 48 percent efficiency (PG&E 2006a, p. 2-18). Auxiliary equipment would include inlet air filters, oxidation filters, gas exhaust silencer stacks, air radiator cooling array, generator step-up and auxiliary transformers and emergency diesel fuel storage tanks.

Air emissions from the proposed facility would be controlled using best available control technology applied to each engine's exhaust. Each system would consist of a selective catalytic reduction unit for oxides of nitrogen (NO<sub>x</sub>) control and an oxidation catalyst unit for carbon monoxide (CO) and volatile organic compounds (VOC) control. The tallest components of the project would be the 100-foot high exhaust stacks. **Project**

**Description Figure 3** shows the general arrangement of the proposed HBRP in relation to the existing HBPP. **Project Description Figure 4** provides an architectural rendering of the proposed project.

## **ELECTRIC TRANSMISSION**

The HBRP would be connected to PG&E's existing HBPP switchyard via 13.8-kV cables and bus work from the generator circuit breakers to new step-up transformers and then via two 60-kV tie lines and one 115-kV tie line into the switchyard. Normally, four of the units would feed into the 115-kV line, and the remaining 6 units would feed into the 60-kV lines. Switchyard improvements would include replacement of the existing 60-kV and 115-kV circuit breakers and replacement of a 115-kV steel lattice tower with three steel poles. No new transmission facilities would be necessary beyond the switchyard (PG&E 2006a, p. 2-19 and Figure 5.2-1).

## **NATURAL GAS SUPPLY**

Natural gas would be supplied to the HBRP via an onsite 10-inch-diameter, high-pressure, natural gas pipeline owned and operated by PG&E. The natural gas would flow through gas scrubber/filter equipment, a gas pressure control station, and a flow-regulating station prior to entering the reciprocating engines (PG&E 2006a, p. 2-20).

## **WATER SUPPLY**

The HBRP proposes using approximately 2,400 gallons of water per day (2.7 acre-feet/year) on average for cooling or other industrial purposes. The engines would use an air radiator cooling system in a closed loop system (similar to automobiles). Raw water for industrial processes and site landscape irrigation would be supplied from PG&E's existing ground water well via a direct connection to an onsite 6-inch-diameter water pipeline.

Potable water demands would average about 160 gallons per day (0.2 acre-feet/year) as required for non-process uses (i.e., sinks, toilets, showers, drinking fountains, eye wash/safety showers, etc.). Potable water would be supplied from a new 4- to 6-inch-diameter on-site pipeline running 1,200 feet to a connection with the existing Humboldt Community Services District (HCSD) line that runs along King Salmon Avenue (PG&E 2006a, pp. 2-20 and 7-1).

## **WASTEWATER DISCHARGE**

The HBRP would discharge process and sanitary wastewater into the HCSD sanitary sewer system at an average rate of about 860 gallons per day. Process wastewater would collect from area washdown, sample drains, and drainage from facility equipment areas. Sanitary wastewater would collect from sinks, toilets, showers, and other sanitary facilities. Both process and sanitary wastewater would be conveyed to HBPP's existing 4-inch-diameter wastewater pipeline, which already interconnects to the HCSD sewer system. The new storm water collection system and outfall would route non-contaminated storm water to the southeast corner of the HBRP site, discharging over land that ultimately would drain into Buhne Slough (PG&E 2006a, Section 2.5.9.1 and Appendix 7B).

## **PROJECT CONSTRUCTION AND OPERATION**

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If approved by the Energy Commission, PG&E proposes to initiate construction of the HBRP in Spring 2008. The project is expected to take about 18 months for construction and startup testing and could begin commercial operation as early as Fall 2009, if there are no delays. The construction workforce would average 101 workers per month and would peak during the sixth through ninth months, with up to 236 workers onsite. Construction costs are estimated to be \$250 million.

Primary construction access would be from King Salmon Avenue via a new temporary construction access road south of the existing HBPP cooling water intake channel. Storage of construction materials and equipment would occur within the project site boundaries north of the HBRP site adjacent to Humboldt Bay and east of the cooling water discharge channel. Construction worker parking would occur in two locations. Within the project site boundaries, parking would occur south of the existing HBPP cooling water intake channel and west of the adjacent HBRP site. Additional parking would occur adjacent to the northwest corner of the HBPP boundaries in a currently abandoned parking lot offsite along King Salmon Avenue (PG&E 2006a, p. 2-26 and Figure 2.3-1).

The Wärtsilä 18V50DF engine generator sets and associated auxiliary equipment would be ocean freighted to the Humboldt area and then transferred from freighter to barges at one of the docks in the Eureka/Arcata area. The barges would then be floated to the Fields Landing Terminal, where the engine-generators would be off-loaded to heavy haul tractors and trucked to the HBRP site via Highway 101 and King Salmon Avenue (PG&E 2006a, p. 8.12-7).

The HBRP would be operated by a full-time staff of 17 employees of PG&E. The power plant would be capable of operating both in Load Following mode to meet local system demand and reliability requirements and in Daily Cycling mode, where the plant could operate up to maximum capacity during the day and totally shut down at night or on weekends. The planned life of the generating facility is 30 years, but it could be operated longer if it is still economically viable (PG&E 2006a, p. 2-27).

## **FORESEEABLE SITE ACTIVITIES NOT PART OF THE HBRP**

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The construction of the HBRP would take place within the boundaries of an active power plant (Units 1 and 2 and the MEPPs) and concurrent with decommissioning activities associated with the 63-MW Unit 3 nuclear reactor. Several separate and distinct activities associated with ongoing operations and nuclear decommissioning actions at the HBPP site include the following:

- Construction of the Independent Spent Fuel Storage Installation (ISFI) Project beginning in 2007, for the purpose of storing spent fuel rods from Unit 3 indefinitely on site in an underground dry-cask storage facility;
- Decommissioning of Unit 3 and associated environmental studies necessary to define the scope of decommissioning, leading to the ultimate removal of the nuclear unit that has been shutdown since 1976; and

- Demolition of the currently operating HBPP Units 1 and 2 and the MEPPs sometime following commercial operation of the HBRP (PG&E 2006a, p. 2-2 through 2-4).

The Energy Commission has no approval authority related to the nuclear decommissioning activities, as construction of the IFSI and decommissioning of Unit 3 are under the jurisdiction of the Nuclear Regulatory Commission, and its licensing preceded the Energy Commission. Similarly, demolition of Units 1 and 2 and the MEPPs is not currently under the jurisdiction of the Energy Commission, as their licensing and commercial operation also preceded the Energy Commission. Demonstrating additional independence of these activities from HBRP is that demolition of the existing HBPP units is not necessary for construction of the HBRP and has not yet been scheduled following their shutdown. In short, staff believes that the demolition of Units 1, 2, and 3 and the MEPPS is not part of the “whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment” (CEQA Guidelines, Cal. Code Regs., tit. 14, Section 15378). However, staff, in its Cumulative Impacts analysis, is considering the combined effects of the proposed HBRP with the individual activities noted above as well as the continued operation of HBPP during the construction and commissioning of HBRP.

## **FACILITY CLOSURE**

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The HBRP would be designed for an operating life of 30 years. At an appropriate point beyond that, the project would cease operation and close down. At that time, it would be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

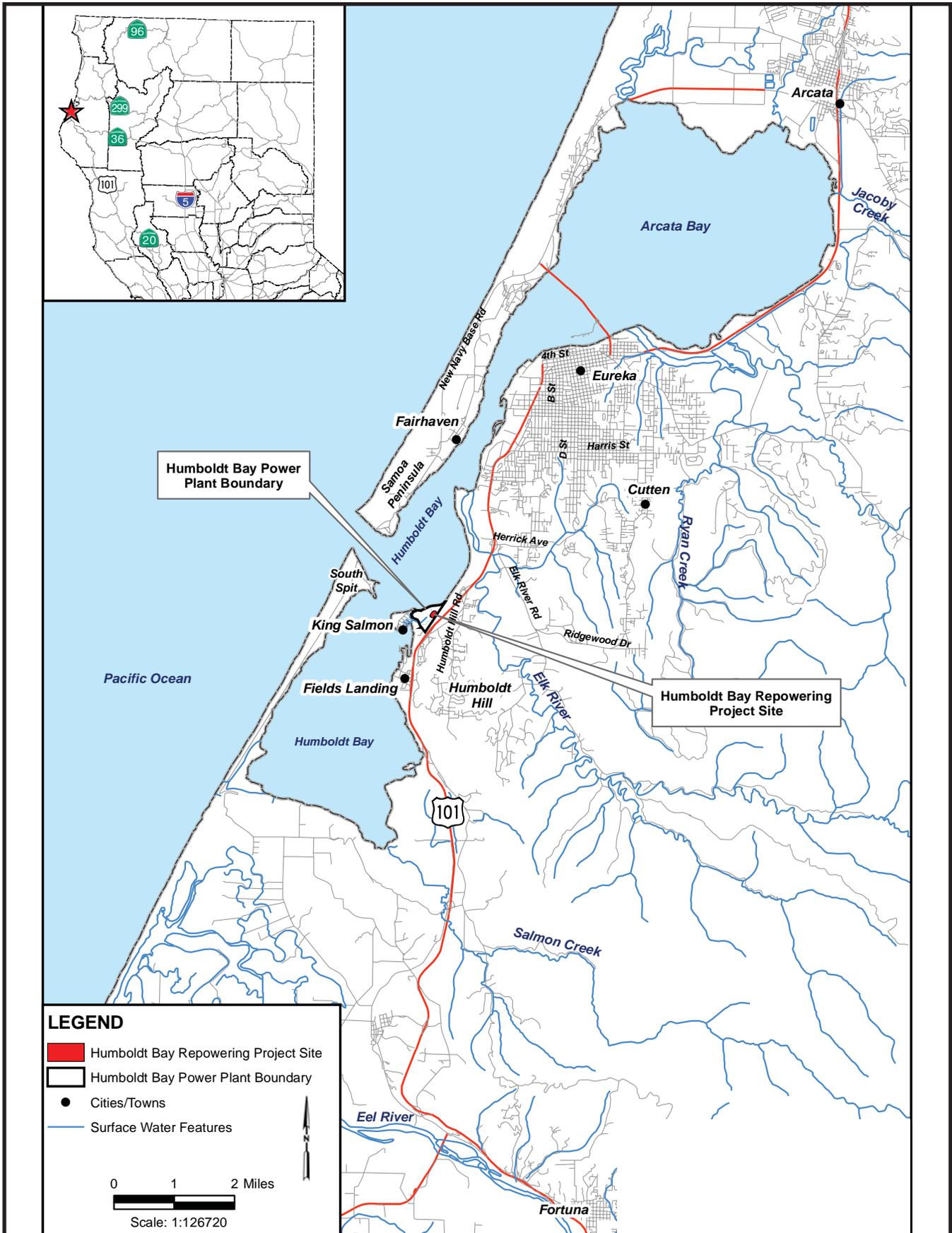
Although the setting for this project does not appear to present any special or unusual closure problems, it is impossible to foresee what the situation would be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting at the time of closure. Facility closure would be consistent with laws, ordinances, regulations and standards in effect at the time of closure.

## **REFERENCES**

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PG&E 2006a – PG&E/R. Kuga (tn: 38050). Humboldt Bay Repowering Project AFC Vol. 1 & 2, 1 AFC CD and 1 Air Modeling CD. 9/29/2006. Rec'd 9/29/2006.

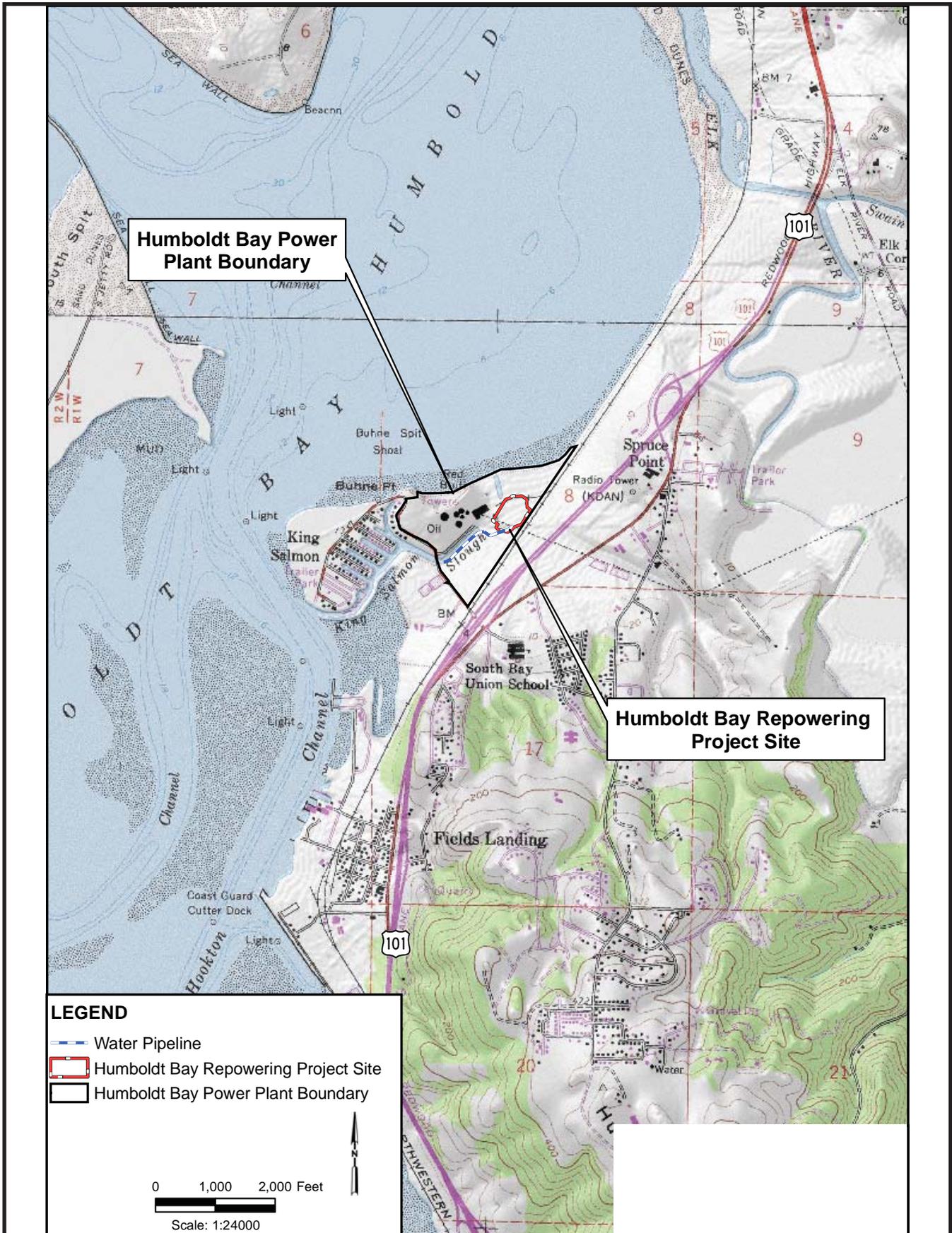
**PROJECT DESCRIPTION - FIGURE 1**  
**Humboldt Bay Repowering Project - Regional Setting**



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITY SITING DIVISION, NOVEMBER 2007

SOURCE: AFC Figure 1.1-1

**PROJECT DESCRIPTION - FIGURE 2**  
**Humboldt Bay Repowering Project - Local Setting**



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITY SITING DIVISION, NOVEMBER 2007

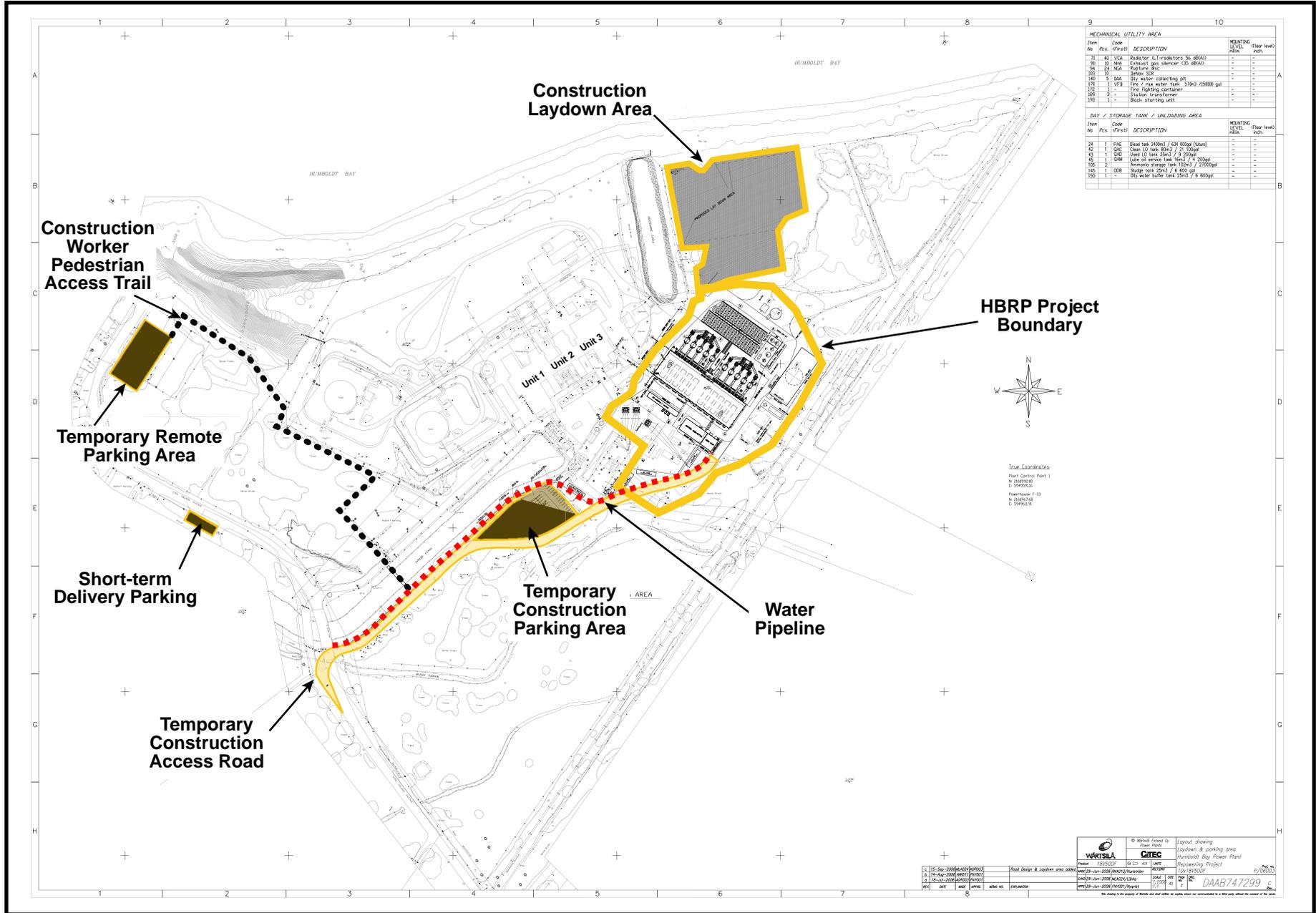
SOURCE: AFC Figure 1.1-3

**PROJECT DESCRIPTION - FIGURE 3**

**Humboldt Bay Repowering Project - General Arrangement of Project & Existing Humboldt Bay Power Plant**

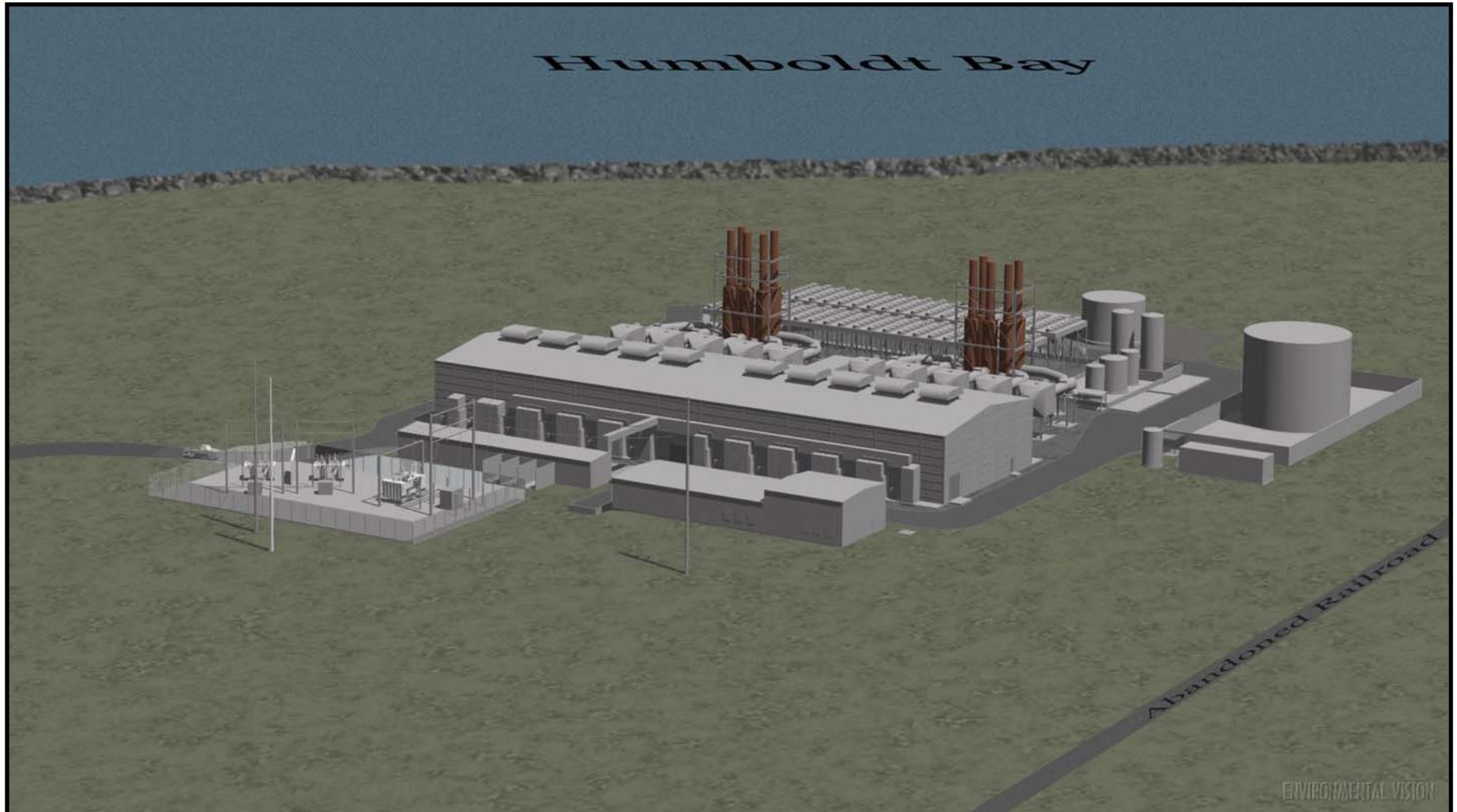
NOVEMBER 2007

PROJECT DESCRIPTION



**PROJECT DESCRIPTION - FIGURE 4**  
Humboldt Bay Repowering Project - Architectural Rendering of Proposed Project

NOVEMBER 2007



PROJECT DESCRIPTION