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February 13, 2007

Mr. John Kessler  
Project Manager  
California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814

<b>DOCKET</b> <b>06-AFC-7,</b>
<b>DATE</b> FEB 13 2007
<b>RECD.</b> FEB 13 2007

**Re: Applicant's Responses to CEC Staff Data Requests 58 through 78 and Workshop Queries 1 through 22, Humboldt Bay Repowering Project (06-AFC-07)**

Dear Mr. Kessler:

Attached are an original and 12 copies of Pacific Gas and Electric's responses to California Energy Commission Staff Data Requests 58 through 78 and Workshop Queries 1 through 22 for the Application for Certification for the Humboldt Bay Repowering Project (06-AFC-07). Your letter of January 11, 2007 transmitting the Data Requests indicated that the Data Request Responses would be due to the Energy Commission on February 12, 2007. We are submitting today because the Dockets Office was closed on February 12 due to the state Holiday.

If you have any questions about this matter, please contact me at (916) 286-0278 or Susan Strachan at (530) 757-7038.

Sincerely,

A handwritten signature in black ink, appearing to read "D M Davy".

Douglas M. Davy, Ph.D.  
AFC Project Manager

Attachment

cc: G. Lamberg  
S. Strachan  
S. Galati

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*Supplemental Filing*

**Responses to CEC Staff Data Requests  
58 through 78 and Workshop Queries 1 through 22**

In support of the

**Application for Certification**

for the

**Humboldt Bay Repowering Project**

Eureka, California

(06-AFC-7)

Submitted to the:  
**California Energy Commission**

Submitted by:



With Technical Assistance by:



Sacramento, California  
February 2007

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# Introduction

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Attached are Pacific Gas and Electric Company's (PG&E) responses to the California Energy Commission (CEC) Staff's data requests numbers 58 through 78 for the Humboldt Bay Repowering Project (HBRP) (06-AFC-7). The CEC Staff served these data requests on January 11, 2007, as part of the discovery process for the HBRP project. The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as CEC Staff presented them and are keyed to the Data Request numbers (58 through 78).

In addition to providing responses to the Data Requests, this document provides responses to Staff queries, or additional informal questions that were raised during the Data Request Response Workshop that was held on February 1, 2007. The workshop queries have been given unique workshop query (WSQ) numbers, listed by discipline and, within discipline, in the order in which they were discussed at the workshop. The WSQ responses appear in this document grouped with the data request responses that are for the same discipline. Because the workshop queries were not formally transmitted by the Staff in written form, they are listed here.

## Air Quality

- WSQ-1 Please provide available PM emission test results for the Wärtsilä 18V32DF engines in operation at the plant in Chambersburg, Pennsylvania.
- WSQ-2 Please evaluate the acute health hazard index for 100% diesel firing, including gaseous components.
- WSQ-3 Please provide an update on the status of the acquisition of the emission reduction credits PG&E is purchasing.
- WSQ-4 Please provide a health risk assessment based on reasonably foreseeable annual hours of operation on diesel fuel. Also provide information regarding why 800 hours per year of operation on diesel fuel is not reasonably foreseeable.
- WSQ-5 Please provide an analysis of the construction impacts associated with creating and enhancing the wetlands proposed as part of the wetland mitigation plan for the HBRP.
- WSQ-6 Please provide a status report on the analysis of significant sources for the PSD increments analysis.

## Biological Resources

- WSQ-7 Please provide justification for proposing a wetland mitigation ratio of 1:1 for temporary impacts to California Coastal Commission delineated wetlands identified in the AFC.

- WSQ-8 Please identify additional mitigation for permanent impacts to freshwater marsh due to the California Coastal Commission's request to increase the mitigation ratio from 2:1 to 4:1 for this habitat type.
- WSQ-9 Please provide a revised wetland mitigation map showing only wetlands under the potential jurisdiction of the U.S. Army Corps of Engineers (USACE).
- WSQ-10 Please submit to the USACE the wetland data sheets for the three areas for which the USACE requested further wetland analysis during the wetland delineation verification on February 1.

### **Cultural Resources**

- WSQ-11 Please provide a cultural resources survey of the wetland mitigation land proposed for the HBRP.

### **Hazardous Materials Management**

- WSQ-12 Please provide a description of what type of cover will be installed over the secondary containment for the ammonia tanks.
- WSQ-13 Please coordinate with South Bay Elementary School regarding notification procedures to the school in the event of a hazardous materials incident at the HBRP.

### **Soil and Water Resources**

- WSQ-14 Please provide an update on the design of the discharge structure to convey stormwater to Buhne Slough.
- WSQ-15 Please provide a conceptual drainage plan for construction.
- WSQ-16 Please describe how the track-out of mud from the construction site on to King Salmon Avenue will be prevented.

### **Transmission System Engineering**

- WSQ-17 Please provide documentation of the CAISO's approval of the conceptual System Protection Scheme (SPS).
- WSQ-18 Confirm that the CAISO has approved the Humboldt-Eureka 60 kV line (Humboldt-Harris section) and the 100 MVAR Static VAR Compensator (SVC).
- WSQ-19 The CAISO approval of a SPS to address (1) the Category B contingency overload on the Humboldt-Trinity 115 kV line and (2) the dynamic stability and low frequency issues.
- WSQ-20 Identify the mitigation for the overloads identified on the Humboldt 115/60 kV 1 and 2 transformers and the Bridgeville 115/60 kV transformer.

### **Waste Management**

- WSQ-21 Please provide an updated map showing the eight areas of concern identified in the Phase I site assessment and the sampling locations for the Phase II site assessment.

## Worker Safety & Fire Protection

WSQ-22 Please provide an update on discussions with the Humboldt Fire District, Eureka Fire Department, and the Eureka Hazardous Materials Response Team regarding potential impacts the HBRP may have on their capability to respond to a fire, hazardous materials spill, or emergency medical services issue at HBRP.

New or revised graphics or tables are numbered in reference to the Data Request or Workshop Query number. For example, the first table used in response to Data Request 60 would be numbered Table DR60-1 (or Table WSQ9-1 for WSQ 9). The first figure used in response to Data Request 72 would be Figure DR72-1, and so on.

Additional tables, figures, or documents submitted in response to a data request (supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of a discipline-specific section and are not sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

PG&E looks forward to working cooperatively with CEC Staff as the HBRP proceeds through the siting process. We trust that these responses address the Staff's questions and remain available to have any additional dialogue the Staff may require.

**Air Quality**  
WSQ Responses 1-6

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# Air Quality (WSQ1-6)

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## PM emission tests for the 18V32DF

WSQ-1 *Please provide available PM emission test results for the Wärtsilä 18V32DF engines in operation at the plant in Chambersburg Pennsylvania.*

**Response:** This information has been requested from Wärtsilä and will be provided as soon as it is available.

## Acute health hazard index

WSQ-2 *Please evaluate the acute health hazard index for 100 percent diesel firing, including gaseous components.*

**Response:** Maximum hourly emissions of noncriteria pollutants were calculated for the Wärtsilä engines during 100 percent diesel firing using the diesel emission factors shown in Table 8.1A-8, Appendix 8.1A to the AFC. Maximum hourly heat input is 148.9 MMBtu/hr (HHV). The results of the calculation are shown in the attached Table WSQ2-1. The calculated emission rates for each gaseous pollutant were weighted by the HARP acute hazard index to calculate a total weighted risk in units of  $(\mu\text{g}/\text{m}^3 \text{ per g/s})^{-1}$ . This weighted risk for diesel firing is shown along with the weighted risk for natural gas firing in Table WSQ2-2. The previous modeling showed that based on a weighted risk of  $6.04 \times 10^{-3} (\mu\text{g}/\text{m}^3 \text{ per g/s})^{-1}$ , the acute health hazard index for the project was 0.39. In Gaussian models modeled concentrations are directly proportional to emission rates, so the value of  $\chi/Q$  developed for the natural gas acute hazard index modeling result can be used to calculate the acute hazard index for diesel firing as follows:

$$\text{Acute HHI for Diesel Firing} = \frac{8.85 \times 10^{-4} (\mu\text{g}/\text{m}^3 \text{ per g/s})^{-1}}{6.04 \times 10^{-3} (\mu\text{g}/\text{m}^3 \text{ per g/s})^{-1}} * 0.39 = 0.057$$

The acute health hazard index for diesel firing is lower than the acute health hazard index for natural gas firing, and both HHIs are well below the significance threshold of 1.

## Emission Reduction Credits

WSQ-3 *Please provide an update on the status of the acquisition of the emission reduction credits PG&E is purchasing.*

**Response:** PG&E is completing negotiations for the acquisition of a small amount of off-site emission reduction credits for the project. PG&E anticipates being able to disclose the details of the facility generating the ERCs not later than March 1, 2007.

## Diesel fuel operation

WSQ-4 *Please provide a health risk assessment based on reasonably foreseeable annual hours of operation on diesel fuel. Also provide information regarding why 800 hours per year of operation on diesel fuel is not reasonably foreseeable.*

**Response:** Reasonably foreseeable annual hours of diesel fuel firing were assessed in two ways based on historical generation and fuel use at Humboldt Bay Power Plant. As discussed in Data Response #7, oil burning at the plant in 2000 and 2001 was due to the high price of natural gas. Since economic dispatch will be prohibited at HBRP, these years were eliminated from both analyses. Further, in 1996, oil was burned in the boilers to reduce inventory below one million gallons due to an environmental regulatory limit to the onsite storage of fuel oil. Based on discussions with plant personnel, it was determined that the oil burned in the boilers in 1994 and 1995 was also burned to reduce inventory. This cannot occur at HBRP because the liquid fuel to be used will be well below the 1 million gallon limit, so oil burned in the boilers during 1994 through 1996 was also eliminated from these analyses. Plant personnel also indicated that operation of the MEPPs during the 1994-96 period was not affected by the oil storage limit, so the oil fuel burned in the MEPPs during that period was included in the calculation of reasonably foreseeable fuel oil use.<sup>1</sup>

First, the quantity of natural gas that was available to the Humboldt Bay Power Plant each year and the MWhrs the plant generated were examined to determine, on an annual basis, how many MWhrs HBRP could have generated during these years using the available natural gas and whether any diesel fuel would have had to have been used to equal the actual Humboldt Bay Power Plant output during those periods. The results of this assessment are shown in Table WSQ4-1. For each year, the HBRP Generation on Available Natural Gas is greater than the Total Generation at Humboldt Bay Power Plant, meaning that the available natural gas each year would have been sufficient for the HBRP to generate the output from the existing units, and no diesel fuel would have been needed. Table WSQ4-1 also shows the additional electricity generation that would be possible without triggering a curtailment, assuming all else remains equal. The data indicate that annual electricity generation using the new HBRP units could be at least 39 percent higher than historical levels without triggering a curtailment. However, this approach underestimates actual potential gas-fired generation because it assumes that the gas used was the only gas available. In fact, natural gas generation could have been higher during non-curtailment periods and that additional gas availability is not reflected in this calculation approach.

To evaluate the effect of short-term supply interruptions, historical fuel use and generation were also studied. It was calculated that, over the last 13 years, oil was used in both the boilers and the MEPPs to generate electricity at a rate equivalent to 46 full-load hours per year of diesel operation of HBRP (see Table WSQ4-2). Although this historical oil use was related to testing and maintenance as well as to curtailments, it was assumed that it was strictly related to curtailments and that it would be in addition to the 50 hours per year per engine that HBRP will be allowed for testing and maintenance. To add an additional degree of conservatism, the total hours of diesel fuel operation were rounded up from 96 to 100 for the revised cancer screening health risk assessment.

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<sup>1</sup> Based on discussions with plant personnel regarding operating practices at Humboldt Bay Power Plant in earlier years, it appears likely that the MEPPs were operated for local area voltage support during storms, rather than as a result of gas curtailments. However, to be conservative, it is assumed that all of the MEPPs operations were due to curtailments.

**Table WSQ2-1**  
**HBRP**  
**Maximum Hourly Non-Criteria Pollutant Emissions for Wärtsilä Reciprocating Engines on Liquid Fuel**

<b>Pollutant</b>	<b>Diesel Emission Factor (1) lb/Mgal</b>	<b>Individual ICE Max. Hourly Emissions (3) lbs/hr</b>
Ammonia	(2)	2.11
Propylene	3.85E-01	0.42
Hazardous Air Pollutants		
Acetaldehyde	3.47E-03	3.77E-03
Acrolein	1.07E-03	1.16E-03
Benzene	1.01E-01	0.11
1,3-Butadiene	-	0.00
Diesel PM (4)	--	5.56
Ethylbenzene	-	0.00
Formaldehyde	1.32E-02	0.01
Hexane	-	0.00
Naphthalene	1.63E-02	0.02
PAHs (listed individually below)	5.02E-04	5.46E-04
Anthracene	1.79E-04	
Benzo(a)anthracene	5.03E-05	
Benzo(a)pyrene	1.81E-05	
Benzo(b)fluoranthrene	7.96E-05	
Benzo(k)fluoranthrene	1.56E-05	
Chrysene	1.06E-04	
Dibenz(a,h)anthracene	2.43E-05	
Indeno(1,2,3-cd)pyrene	2.89E-05	
Toluene	3.74E-02	0.04
Xylene	2.68E-02	0.03

Notes:

- (2) All factors are CATEF mean values for large Diesel engines (SCC 20200102).
- (3) Based on 10 ppm ammonia slip from SCR system.
- (4) Based on maximum ICE firing rate of 148.9 MMBtu/hr and fuel HHV of 136,903 Btu/gal for Diesel fuel  
1.09 Mgal/hr Diesel fuel
- (5) Front half only, per ATCM.

**Table WSQ2-2**  
**HBRP**  
**Calculation of Acute HHI for Wärtsilä Reciprocating Engines**

Compound	Natural Gas w/ Pilot Injection				Liquid Fuel			
	Max Hourly Emissions Per Engine g/s	HARP Acute HI (per ug/m3)	Acute HHI Model Input (per ug/m3 per g/s)	Modeled Contribution to Acute HHI	Max Hourly Emissions Per Engine g/s	HARP Acute HI (per ug/m3)	Acute HHI Model Input (per ug/m3 per g/s)	Modeled Contribution to Acute HHI
Ammonia	0.2654	3.13E-04	8.31E-05	5.36E-03	0.2654	3.13E-04	8.31E-05	5.36E-03
Propylene	0.0958	--	--	--	0.0528	--	--	--
Acetaldehyde	9.393E-03	--	--	--	4.756E-04	--	--	--
Acrolein	1.048E-03	5.26E+00	5.51E-03	3.56E-01	1.466E-04	5.26E+00	7.71E-04	4.98E-02
Benzene	3.943E-03	7.69E-04	3.03E-06	1.96E-04	1.384E-02	7.69E-04	1.06E-05	6.87E-04
1,3-Butadiene	6.515E-03	--	--	--	0	--	--	--
Diesel PM	--	--	--	--	7.007E-01	--	--	--
Ethylbenzene	1.262E-03	--	--	--	0	--	--	--
Formaldehyde	4.181E-02	1.06E-02	4.43E-04	2.86E-02	1.809E-03	1.06E-02	1.92E-05	1.24E-03
Hexane	2.012E-02	--	--	--	0	--	--	--
Naphthalene	4.574E-04	--	--	--	2.234E-03	--	--	--
PAHs (listed individually below)	4.863E-06	--	--	--	6.877E-05	--	--	--
<i>Benzo(a)anthracene</i>								
<i>Benzo(a)pyrene</i>								
<i>Benzo(b)fluoranthrene</i>								
<i>Benzo(k)fluoranthrene</i>								
<i>Chrysene</i>								
<i>Dibenz(a,h)anthracene</i>								
<i>Indeno(1,2,3-cd)pyrene</i>								
Toluene	4.270E-03	2.70E-05	1.15E-07	7.44E-06	5.126E-03	2.70E-05	1.38E-07	8.93E-06
Xylene	1.149E-02	4.55E-05	5.23E-07	3.37E-05	3.673E-03	4.55E-05	1.67E-07	1.08E-05
		Total =	6.04E-03	0.39		Total =	8.85E-04	0.057

**Table WSQ4-1  
Projected Diesel Firing at HBRP: Annual Supply Basis**

HBRP Natural Gas Heat Rate: 8649 Btu/kwh

	Liquid Fuel Consumption at HBPP (MMBtu/year)*			Natural Gas Consumption at HBPP (MMBtu/year)	Total Fuel Consumption at HBPP (MMBtu/year)	Total Generation at HBPP (MWhrs/yr)	HBRP Generation on Available Natural Gas		Additional HBRP Natural Gas Generation Available
	Boilers	MEPPs	Total				Shortfall (MWhrs/yr)		
<b>HBRP Proposed Limit</b>			1,191,200	8,195,560			947,573		
<b>2006</b>	91,940	191,126	283,065	5,547,656	5,830,721	462,967	641,422	0	39%
<b>2005</b>	0	175,583	175,583	5,563,421	5,739,004	462,274	643,244	0	39%
<b>2004</b>	0	192,472	192,472	4,833,343	5,025,815	394,596	558,833	0	42%
<b>2003</b>	5,496	230,932	236,428	3,104,750	3,341,178	244,810	358,972	0	47%
<b>2002</b>	4,475	117,539	122,014	4,919,123	5,041,137	392,910	568,750	0	45%
<b>2001</b>	n/a	n/a	n/a	5,626,493	5,626,493	699,582	650,537	n/a	n/a
<b>2000</b>	n/a	n/a	n/a	6,318,614	6,318,614	555,819	730,560	n/a	n/a
<b>1999</b>	0	134,482	134,482	3,229,330	3,363,812	241,764	373,376	0	54%
<b>1998</b>	8,297	73,479	81,777	2,898,769	2,980,546	209,081	335,157	0	60%
<b>1997</b>	0	16,306	16,306	2,219,821	2,236,127	149,483	256,656	0	72%
<b>1996</b>	n/a	53,665	53,665	2,124,443	2,124,443	150,391	245,629	0	63%
<b>1995</b>	n/a	27,944	27,944	2,215,553	2,215,553	180,700	256,163	0	42%
<b>1994</b>	n/a	24,978	24,978	3,098,769	3,098,769	235,089	358,281	0	52%

\* Oil burns during 2000 and 2001 were economic oil burns. HBRP will be prohibited from burning liquid fuel for this reason, so economic oil burns are not included in this analysis. In 1994, 1995 and 1996, residual oil was burned in the boiler to reduce inventory. This will not occur at HBRP, so boiler oil use in these years was also eliminated from the analysis.

Table WSQ4-2

Projected Diesel Fuel Firing at HBRP: Actual Historical Oil Use Basis

HBRP Liquid Fuel Heat Rate: 8949 Btu/kwh

	Liquid Fuel Consumption at HBPP (MMBtu/year)*			Boiler Oil MWhrs	MEPPs MWhrs	Total Oil Generation at HBPP (MWhrs/yr)	Heat Input Required by HBRP to Generate Equiv. MWhrs (MMBtu/yr)	Percentage of Proposed HBRP Oil Use	Equivalent HBRP Liquid Fuel Operating Hours Per Year
	Boilers	MEPPs	Total						
<b>HBRP Proposed Limit</b>			1,191,200						
<b>2006</b>	91,940	191,126	283,065	7,361	11,446	18,807	168,303	14.13%	113.0
<b>2005</b>	0	175,583	175,583	0	11,263	11,263	100,793	8.46%	67.7
<b>2004</b>	0	192,472	192,472	0	10,831	10,831	96,927	8.14%	65.1
<b>2003</b>	5,496	230,932	236,428	410	12,634	13,044	116,733	9.80%	78.4
<b>2002</b>	4,475	117,539	122,014	350	7,912	8,261	73,931	6.21%	49.7
<b>2001</b>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>2000</b>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>1999</b>	0	134,482	134,482	0	9,142	9,142	81,812	6.87%	54.9
<b>1998</b>	8,297	73,479	81,777	583	4,948	5,531	49,494	4.15%	33.2
<b>1997</b>	0	16,306	16,306	0	917	917	8,206	0.69%	5.5
<b>1996</b>	n/a	53,665	53,665	n/a	3,006	3,006	26,901	2.26%	18.1
<b>1995</b>	n/a	27,944	27,944	n/a	1,657	1,657	14,828	1.24%	10.0
<b>1994</b>	n/a	24,978	24,978	n/a	1,603	1,603	14,345	1.20%	9.6
<b>Average</b>									<b>45.9</b>

\* Oil burns during 2000 and 2001 were economic oil burns. HBRP will be prohibited from burning liquid fuel for this reason, so economic oil burns are not included in this analysis. In 1994, 1995 and 1996, residual oil was burned in the boiler to reduce inventory. This will not occur at HBRP, so boiler oil use in these years was also eliminated from the analysis.

The revised cancer screening risk assessment is shown in Tables WSQ4-3 and WSQ4-4. Table WSQ4-3 shows the revised calculation of noncriteria pollutants based on 100 hours per year of diesel fuel firing: annual diesel particulate matter (DPM) emissions are increased from 1.39 tons per year to 2.78 tons per year.<sup>2</sup> As shown in Table WSQ4-4, this change increases the high-end weighted cancer risk value used in the screening health risk modeling from 2.19 in one million ( $\mu\text{g}/\text{m}^3$  per  $\text{g}/\text{s}$ )<sup>-1</sup> to 3.33 in one million ( $\mu\text{g}/\text{m}^3$  per  $\text{g}/\text{s}$ )<sup>-1</sup>. Using the  $\chi/Q$  approach described in Response WSQ-2, it was calculated that the cancer risk based on 100 hours per year of diesel fuel firing in the HBRP engines will be 9.8 in one million.

This provides an extremely conservative estimate sufficient to cover the lifetime of HBRP because:

- This approach does not reflect the expected decrease in the frequency of curtailments because of the flexibility and efficiency of HBRP (as shown in the first, annual average analysis); and
- This approach double-counts diesel operations for testing and maintenance, as discussed previously.

It is not appropriate to evaluate cancer risk based on 800 hours per year of diesel fuel use because the 800 hours represents a theoretical worst case and is not reasonably foreseeable. The analysis of historical curtailment conditions presented above demonstrates that 100 hours per year per engine of diesel fuel operation is reasonably foreseeable for all purposes and is overpredictive of potential diesel fuel use because it double-counts diesel fuel operations for testing and maintenance. The 800 hour per year limit is not anticipated to be required under any circumstances.<sup>3</sup> The highest amount of liquid fuel burned at Humboldt Bay Power Plant since 1994 for all purposes (excluding only economic dispatch and inventory reduction) was the equivalent of 113 full-load hours of operation for the newer, more efficient HBRP units.

As discussed in the January 26, 2007 response to the Air Resource Board's (ARB) request for an additional cancer risk assessment, the screening health risk assessment in the AFC was prepared for maximum allowable routine and permitted uses, excluding emergency operations, which is consistent with the manner in which SHRAs are prepared for all emergency diesel engines with limited testing and maintenance hours. The amendments to the ARB Air Toxics "Hot Spots" Information and Assessment Act Emission Inventory Criteria and Guidelines Report, adopted by the Board on November 16, 2006, specifically address emergency operations, as follows:

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<sup>2</sup> For the cancer risk assessment, DPM is used as a surrogate for all carcinogenic substances, per ARB guidance, so individual gaseous compounds in diesel exhaust are not considered separately as they are for the acute health risk assessment. Emissions of other noncriteria pollutants during natural gas firing will be reduced slightly because the increased diesel use would displace some natural gas; however, this effect is small and is ignored in this analysis.

<sup>3</sup> For PSD permitting purposes, HBRP had to identify a worst-case, not-to-exceed scenario that could be reflected in federally enforceable conditions while allowing the facility assurance that PG&E's obligation to serve could be met under all conditions. However, the fact that this 800-hour per year scenario was identified as an extreme worst case does not suggest that it is, in fact, reasonably foreseeable.

“Emergency Operations” means an activity that cannot be reasonably foreseen by the facility, and the district has determined is not part of routine and predictable operations, and is therefore not part of “Hot Spots” reporting.

“Emergency Use” means providing electrical power or mechanical work during any of the following events and subject to the following conditions:

- (a) the failure or loss of all or part of normal electrical power service or normal natural gas supply to the facility:
  - (i) which is caused by any reason other than the enforcement of a contractual obligation the owner or operator has with a third party or any other party; and
  - (ii) which is demonstrated by the owner or operator to the district air pollution control officer’s satisfaction to have been beyond the reasonable control of the owner or operator...

“Routine and Predictable” is determined by the district, and means all of the regular operations at the facility. Emergency or catastrophic releases at a facility are not “routine and predictable” and are not included in a facility’s emission inventory.

The guidelines under which these risk assessments are prepared specifically state that routine and predictable emissions should be the basis for health risk assessments, not emergency operations. PG&E understands the importance of defining what is meant by “emergency operations” in this case, where PG&E is the area’s load serving entity for both natural gas and electricity, and will work with the CEC Staff, ARB, and North Coast Unified Air Quality Management District (NCUAQMD) to appropriately define this term for the purposes of HBRP.

A second reason for preparing a cancer risk assessment based on reasonably foreseeable operations rather than 800 hours per year is that a cancer risk assessment reflects a 70-year exposure period. Ambient air quality standards are based on relatively short-term exposures (from one hour to one year), so it is reasonable to evaluate criteria pollutant impacts based on the worst-case emergency conditions, including a single, worst-case year. However, because cancer risk is based on long-term exposures of up to 70 years, it is not appropriate to assess long-term risk based on a worst-case, short-term emergency condition that is unlikely to occur.

## Wetland construction air quality impacts

WSQ-5 *Please provide an analysis of the construction impacts associated with creating and enhancing the wetlands proposed as part of the wetland mitigation plan for the HBRP.*

**Response:** This analysis will be provided once the additional mitigation land is identified.

## PSD increments analysis

WSQ-6 *Please provide a status report on the analysis of significant sources for the PSD increments analysis.*

**Response:** A revised letter requesting the information needed to prepare the increments analysis was sent to the NCUAQMD on Friday, February 2. Once the information is received, the analysis will be prepared. It is anticipated that the analysis will be submitted by the end of February 2007.



**Table WSQ4-4**  
**HBRP**  
**Revised Calculations for Wärtsilä Reciprocating Engine Cancer Risk Assessment**

Compound	Annual Average Emissions Per Engine g/s	Average Point Estimate			High-End Point Estimate			Worker Exp: Derived (OEHH) Method		
		Unit Risk (per ug/m3)	Cancer Risk Model Input (per ug/m3 per g/s)	Modeled Contribution to Cancer Risk (3)	Unit Risk (per ug/m3)	Cancer Risk Model Input (per ug/m3 per g/s)	Modeled Contribution to Cancer Risk (4)	Unit Risk (per ug/m3)	Cancer Risk Model Input (per ug/m3 per g/s)	Modeled Contribution to Cancer Risk (6)
Ammonia	1.82E-01	0	0	0	0	0	0	0	0	0
Propylene	7.03E-02	0	0	0	0	0	0	0	0	0
Acetaldehyde	6.91E-03	2.60E-06	1.80E-02	3.57E-02	3.77E-06	2.61E-02	5.19E-02	5.72E-07	3.95E-03	7.91E-03
Acrolein	7.71E-04	0	0	0	0	0	0	0	0	0
Benzene	2.86E-03	2.60E-05	7.43E-02	1.48E-01	3.77E-05	1.08E-01	2.14E-01	5.72E-06	1.63E-02	3.27E-02
1,3-Butadiene	4.79E-03	1.56E-04	7.48E-01	1.49	2.26E-04	1.08	2.16	3.43E-05	1.64E-01	3.29E-01
Diesel PM (Note 1)	8.00E-03	2.86E-04	2.29	4.54	4.15E-04	3.32	6.61	6.29E-05	5.03E-01	1.01
Ethylbenzene	9.29E-04	0	0	0	0	0	0	0	0	0
Formaldehyde	3.08E-02	5.46E-06	1.68E-01	3.34E-01	7.91E-06	2.43E-01	4.84E-01	1.20E-06	3.69E-02	7.39E-02
Hexane	1.48E-02	0	0	0	0	0	0	0	0	0
Naphthalene	3.30E-04	3.12E-05	1.03E-02	2.04E-02	4.52E-05	1.49E-02	2.97E-02	6.86E-06	2.26E-03	4.52E-03
PAHs (listed individually below) (Note 2)	3.36E-06	8.05E-03	2.71E-02	5.38E-02	4.02E-02	1.35E-01	2.69E-01	1.47E-02	4.94E-02	9.88E-02
<i>Benzo(a)anthracene</i>		8.05E-04			4.02E-03			1.47E-03		
<i>Benzo(a)pyrene</i>		8.05E-03			4.02E-02			1.47E-02		
<i>Benzo(b)fluoranthrene</i>		8.05E-04			4.02E-03			1.47E-03		
<i>Benzo(k)fluoranthrene</i>		8.05E-04			4.02E-03			1.47E-03		
<i>Chrysene</i>		8.05E-05			4.02E-04			1.47E-04		
<i>Dibenz(a,h)anthracene</i>		3.47E-03			1.48E-02			5.17E-03		
<i>Indeno(1,2,3-cd)pyrene</i>		8.05E-04			4.02E-03			1.47E-03		
Toluene	3.13E-03	0	0	0	0	0	0	0	0	0
Xylene	8.44E-03	0	0	0	0	0	0	0	0	0
Based on 100 hrs/yr of Diesel firing			3.33 per ug/m3 per g/s	6.6 in one million		4.93 per ug/m3 per g/s	9.8 in one million		0.78 per ug/m3 per g/s	1.6 in one million
Based on 50 hrs/yr of Diesel firing			2.19 per ug/m3 per g/s	4.4 in one million		3.27 per ug/m3 per g/s	6.5 in one million		0.525 per ug/m3 per g/s	1.1 in one million

Notes: (1) Based on 100 hrs/yr of backup Diesel fuel operation; Front half only, per ATCM.  
(2) Maximum unit risk value applied to all PAHs for purposes of this analysis.

**Alternatives**  
Data Response 58

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# Alternatives (58)

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## Projects proposed in response to the LTRFO

58. Please provide information describing any other projects proposed for serving the Humboldt Load Pocket associated with the 2004 LTRFO. If available, please include the following details:
- a. Project description, including the generation technology and capacity in MW;
  - b. Capability for rapid-response loading in order to maintain service to the Humboldt Load Pocket during transmission interruptions and natural gas curtailments;
  - c. Location;
  - d. If an alternative power plant site, its proximity to an existing substation;
  - e. Conceptual routes and distances to interconnect to both the 115 kV and 60 kV transmission system;
  - f. Distance and possible route to connect to natural gas transmission pipeline;
  - g. Distance and possible route to connect to water service;
  - h. Distance and possible route to connect to wastewater service;
  - i. Area (acres) and zoning designation of parcel; and
  - j. Potential environmental impacts.

**Response:** PG&E received four qualified offers from four different participants for new generation in Humboldt County. One offer was for combined-cycle technology, two offers were for simple-cycle combustion turbine technology, and one offer was for reciprocating engine technology. All four offers proposed natural gas fuel and provided liquid fuel capabilities, with approximately 4 days of liquid fuel storage at the site. The long-term request for offers required that bidders specify a proposed project location in their proposal. For Humboldt County, the facility could be located at PG&E's existing Humboldt Bay Power Plant site or another site to be specified by the bidder. All four offers proposed a location at PG&E's existing Humboldt Bay Power Plant site.

Specific responses to questions 58a – 58j are as follows:

- a. Project description, including the generation technology and capacity in MW;

Bidder #1: Simple-cycle gas turbines (3 x GE LM6000, 147MW)

Bidder #2: Simple-cycle gas turbines (3 x GE LM6000, 147MW)

Bidder #3: Combined-cycle gas turbines (3 x GE LM6000, two with HRSGs, and 1 x 26MW steam Turbine, 158 MW)

Bidder #4: Reciprocating engines (10 x Wärtsilä 18V50DF, 163MW)

*b. Capability for rapid-response loading in order to maintain service to the Humboldt Load Pocket during transmission interruptions and natural gas curtailments;*

All qualified bidders satisfied PG&E's RFO criteria with regards to rapid-response loading.

*c. Location:*

All four offers proposed a location at PG&E's existing Humboldt Bay Power Plant site.

*d. If an alternative power plant site, its proximity to an existing substation;*

Not Applicable. All offers specified the existing Humboldt Bay Power Plant site.

*e. Conceptual routes and distances to interconnect to both the 115 kV and 60 kV transmission system;*

All were essentially the same as HBRP since all bids were located on the same site as HBRP.

*f. Distance and possible route to connect to natural gas transmission pipeline;*

All were the same as HBRP since all were on the same site as HBRP. It should be noted that the three LM6000 gas turbine bids would have required onsite gas compression. The HBRP does not require gas compression because it uses a reciprocating engine technology.

*g. Distance and possible route to connect to water service;*

Because the gas turbines would use significantly more water than the reciprocating engines, the turbine options all considered using treated wastewater from the Eureka wastewater treatment plant, approximately 2 miles north of HBRP. For each project, the reclaimed water supply pipeline was proposed to run along the Pacific Northern railroad tracks. Much of the land along this pipeline route, however, is considered environmentally sensitive.

*h. Distance and possible route to connect to wastewater service;*

All bids proposed using the existing sewer connection at the Humboldt Bay Power Plant.

*i. Area (acres) and zoning designation of parcel; and*

All four bids were for the same site.

*j. Potential environmental impacts.*

The three LM6000 gas turbine bids were viewed as having more significant impacts than the reciprocating engine proposal because of the environmental sensitivities of the water supply pipeline. The reciprocating engine proposal required no offsite linears. The gas turbine projects would also use much more water and the combined-cycle option would have significantly higher volumes of wastewater discharge. In addition, the combined-cycle bid involved the use of a cooling tower, which would have created a cooling tower plume. The size of the plume would have been larger than what is produced from the existing Humboldt Bay Power Plant. Other environmental effects were viewed as very similar from a CEQA perspective.

# **Biological Resources**

WSQ Responses 7-10

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# Biological Resources (WSQ7-10)

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## Temporary impacts mitigation ratio

WSQ-7 *Please provide justification for proposing a wetland mitigation ratio of 1:1 for temporary impacts to Coastal Commission delineated wetlands identified in the AFC.*

**Response:** Attachment WSQ7-1 is PG&E's written response to the California Coastal Commission, documenting the justification for a wetland mitigation ratio of 1:1 for temporary impacts to California Coastal Commission (single-parameter) wetlands.

## Freshwater marsh mitigation ratio

WSQ-8 *Please identify additional mitigation for permanent impacts to freshwater marsh due to the California Coastal Commission's request to increase the mitigation ratio from 2:1 to 4:1 for this habitat type.*

**Response:** Mitigation plans for the additional impacts to freshwater marsh are not yet final. PG&E will provide this information in a future submittal.

## USACE wetlands

WSQ-9 *Please provide a revised wetland mitigation map showing only wetlands under the potential jurisdiction of the U.S. Army Corps of Engineers (USACE).*

**Response:** Development of the revised wetland mitigation map will require additional fieldwork. PG&E will provide this information in a future submittal.

## Wetland data sheets

WSQ-10 *Please submit to the USACE the wetland data sheets for the three areas for which the USACE requested further wetland analysis during the wetland delineation verification on February 1, 2007.*

**Response:** Development of the wetland data sheets will require additional fieldwork. PG&E will provide this information in a future submittal.

## **Attachment WSQ7-1**

PG&E's Response to the California Coastal Commission  
Regarding Wetland Mitigation

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Virginia Dains  
Geobotanical Phenomenology  
3371 Ayres Holmes Road  
Auburn, California 95602-9747

John Dixon  
California Coastal Commission  
North Coast District Office  
710 E Street, Suite 200  
Eureka, California 95501

Dear Mr. Dixon,

Thank you for meeting with Debra Crowe and myself at the PG&E Humboldt Bay Repowering Project (HBRP) project site on February 1, 2007. I appreciate the time you have taken out of your schedule to review my Coastal Commission wetland delineation. This letter provides a summary of our field discussions and supplemental information supporting our proposed mitigation ratios, as you have requested. I have included photographs taken over the 2006 survey season and some additional research literature.

I feel that we have broadly mapped the one-parameter wetlands at the HBRP site according to vegetation criteria alone. Negative findings for wetland hydrology in these mapped areas were determined during direct observation of the site following 2 inches of rainfall in late April, 2006. Soils in the mapped Coastal Commission wetlands were not saturated or ponded. Bore hole observations in the lowest part of the landscape showed no saturation or seepage after being open 1 hour. Wetland hydrology was not present.

Soils throughout the HBRP project site are composed of fill material. The source of some fill is the dewatered and dispersed dredge spoil from the existing King Salmon Resort fishermen's channel and PG&E generation plant's intake and outlet channels. Also, the construction of the Humboldt Bay Power Plant during the 1950s and 1960s involved the removal of a portion of Buhne Hill to create a level building site for Units 1, 2, and 3 and its redeposition further south, where the HBRP will be located. Negative findings for soil criteria were based on the lack of saturation or evidence of ponding during our initial site visit.

Further characterizations of the site's vegetation led to positive findings for the wetland vegetation criteria alone. This is based on a predominance of plants rated FACULTATIVE in Reed 1988<sup>1</sup>. This technically defines the areas as wetlands under the

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<sup>1</sup> Reed, P.B. 1988 National list of plant species that occur in wetlands: California (Region 0). (Biological Report 88 [26-10]). U.S. Fish and Wildlife Service. St. Petersburg, FL.

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one-parameter method. However, there are site-specific factors that equally explain the predominance of these FACULTATIVE species other than the presence of wetland conditions. We discussed these in the field last Thursday, and I am summarizing those observations here:

- 1) There is no natural landscape pattern to the presence of hydrophytic vegetation. Due to the presence of mixed fill, subsurface textural and structural variability is unrelated to landscape position. A mosaic pattern of upland and FACULTATIVE plants reflects subsoil deposits rather than local hydrology. Soil observations in the one-parameter wetlands revealed the presence of discontinuous fine-over-coarse capillary membranes created by dredged clay placed over coarse gravel (brick or asphalt) and sand. This can create a patchy distribution of soil water content that never reaches the point of saturation.
- 2) The single-parameter wetland areas are regularly mowed. This consistent and long-term management has selected for a group of plants tolerant of regular cropping. This would include cultivated pasture plants adapted to grazing, perennials with resistant rootstock that provides them the ability to resprout, or low growing species un-affected by removal of the upper canopy. The dominant FACULTATIVE plants observed in the one-parameter wetlands at the site are well described by these adaptive traits. Bird's foot trefoil (*Lotus corniculatus*) and perennial rye (*Lolium perenne*) are widely planted pasture species. Bristly ox-tongue (*Picris echioides*) and common aster (*Aster chilensis*) are robust tap-rooted perennials. Given these characteristics, the dominance of these species is likely to be artificially maintained by mowing.
- 3) The seasonal mowing of these one-parameter wetlands promotes artificially high moisture content in the soil. The consistent and long-term mowing of the vegetation in the one-parameter wetlands removes biomass related to water transpiration. This action leaves more water in the soil column that supports FACULTATIVE vegetation. It has been shown that seasonal wetlands in grazed and ungrazed pastures on like soils over a wide latitudinal range can differ in the duration of ponding by a factor of 2, from a maximum days of ponding of 60 in ungrazed pastures to nearly 120 days in grazed pastures<sup>2</sup>. Maintenance mowing of the one-parameter wetlands at the HBRP site can have a comparable affect, and if halted would likely result in a change of plant dominance to upland species.
- 4) Associated species are upland plants. If the two dominant FACULTATIVE plants in these one-parameter wetlands are ignored, the criteria for hydrophytic vegetation would be negative. Much of the mapped one-parameter wetland is dominated by *Lolium perenne* and *Lotus corniculatus*.

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<sup>2</sup> Marty, J. and C. Pyke 2005 Cattle Grazing Mediates Climate Change Impacts on Ephemeral Wetlands. Conservation biology Vol. 19. No 5;1619-1625, October, 2005.

The most common associated species are typically *Anthoxanthum odoratum* (FACU) or *Hypochaeris radicata* (FACU). If FACW or OBLIGATE plants are noted in these wetland polygons, their occurrence is incidental with minimal cover.

- 5) The existing one-parameter wetlands have limited value to wildlife. Most of the use of these areas is due to their proximity to landscape trees or shrubby corridors. Wildlife species observed using the one-parameter wetlands were limited to American robins, house sparrows, European starlings, and savanna sparrows. Voles, pocket gophers, and western fence lizards are also present.
- 6) The one-parameter wetlands are not native plant communities. The dominant and associated plants in these wetlands are introduced species responding to a disturbance driven environment. Of the few OBLIGATE plants present, *Mentha pulegium* is considered a noxious weed in Humboldt County<sup>3</sup>

In light of these observations it is my professional opinion that the vegetation in the one-parameter wetlands at the HBRP site dominated by FACULTATIVE plant species is a product of management and land use factors, and not of wetland indicator plant's abilities to function as hydrophytes. In addition, the majority of one-parameter wetland areas are within the temporary construction areas that would be in use for two years and returned to preconstruction conditions. The temporary laydown area would be used by PG&E for several more years after HBRP is constructed for HBPP demolition purposes. Because of these factors, we are proposing to mitigate the temporary and permanent losses of one-parameter wetlands at mitigation replacement ratio of less than 4:1. In lieu of the recommended 4:1 acreage compensation for Coastal Commission wetlands, we propose to create broadly functioning replacement wetlands that have enhanced wildlife, natural community, and economic value. Details and acreages of this conceptual mitigation plan are discussed in the HBRP Application For Certification (AFC). An electronic copy of the AFC document can be found at the California Energy Commission (CEC) web site: <http://www.energy.ca.gov/sitingcases/humboldt/documents/index.html>. A hardcopy of the Biological Resources (Section 8.2) that presents the conceptual mitigation plan is attached for your reference.

Thank you for your time and consideration of this project. Please contact me at 530-888-9180 directly, or Debra Crowe/CH2MHILL at 916-286-0385 if you have any questions, concerns, or require additional information.

Sincerely,

Virginia Dains



<sup>3</sup> Ayres, Tina 2000 Invasive Weeds of Humboldt County, a Guide for Concerned Citizens U.S. Bureau of Land Management, Bug Press, August 2000

cc. Greg Lamberg/PG&E  
Tom Luster/CCC  
Carol Heidschik/USACE  
John Kessler/CEC  
John Mathias/CEC  
Susan Strachan/Strachan Consulting  
Doug Davy/CH2MHILL  
Debra Crowe/CH2M HILL



Photo 1-- Initial site April 28, 2006 visit showing water ponded in Corps wetlands.



Photo 2-- Initial site visit April 28, 2006 showing algal matting in depressions as evidence for wetland hydrology. Plant cover is *Alopecurus geniculatus* (OBL).



Photo 3-- Slight depression with algal matting and supporting *Eleocharis macrostachya* (OBL) in Corps wetlands.



Photo 4-- Initial site visit in Temporary access road area showing depressional area of low vegetation surrounded by grassland dominated by *Anthoxanthum odoratum* (FACU).



Photo 5-- Transect Plot 15 in temporary access road showing dominant cover of *Lotus corniculatus* (FAC) after mowing.



Photo 6-- Mowed upland vegetation of *Anthoxanthum odoratum* (FACU) with yellow *Hypochaeris radicata* flower (FACU) and regrowth of narrow-leaved *Aster chilensis* (FAC) showing late season growth as an adaptation to cropping..



Photo 7 Field corner adjacent to mapped Coastal Commission wetlands in the proposed laydown area showing cover in upland species wild oat and sow thistle along with tap-rooted *Rumex crispus* (FACW-).



Photo 8 Un-cleared area around stake showing dominance of *Anthoxanthum odoratum* (FACU) in relation to the low cover of *Lotus corniculatus* FACULTATIVE species in the mowed area.

# **Cultural Resources**

WSQ Response 11

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# Cultural Resources (WSQ11)

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## Wetland mitigation land survey

WSQ-11 *Please provide a cultural resources survey of the wetland mitigation land proposed for the HBRP.*

**Response:** PG&E will conduct the survey as soon as the final choice of wetland mitigation land is made in conjunction with the California Coastal Commission and USACE review of the HBRP wetland delineation. PG&E will provide CEC Staff with the results of the survey at that time.

**Hazardous Materials Management**  
Data Responses 59-63 and WSQ Responses 12-13

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# Hazardous Materials Management (59-63 and WSQ12-13)

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## Dry cask storage area jurisdiction

59. *After decommissioning of the Unit 3 nuclear reactor has been completed, will the NRC continue to have jurisdiction over the dry cask storage area?*

**Response:** Yes. PG&E has received a separate Nuclear Regulatory Commission (NRC) license for the dry cask storage facility.

## HBRP/HBPP perimeter during construction and demolition

60. *During construction and demolition activities of the HBRP, will the perimeter of the HBRP be contiguous with the existing perimeter of the Humboldt Bay Power Plant?*

**Response:** No. The HBRP will have its own perimeter and perimeter fence. The entire Humboldt Bay Power Plant property will remain in PG&E ownership and control.

## Perimeter security during construction and demolition

61. *During construction and demolition activities of HBRP, will the perimeter security of the HBRP be operated and manned by the same security personnel of the Humboldt Bay Power Plant?*

**Response:** No. The HBRP will have its own security personnel.

## HBRP/HBPP perimeter during operations

62. *During operations, will the perimeter of the HBRP be contiguous with the existing perimeter of the Humboldt Bay Power Plant?*

**Response:** No. The HBRP will have its own perimeter and perimeter fence. The entire Humboldt Bay Power Plant property will remain in PG&E ownership and control.

## Perimeter security during operations

63. *During operations, will the perimeter security of the HBRP be operated and manned by the same security personnel of the Humboldt Bay Power Plant?*

**Response:** No. The HBRP will have its own security personnel.

## Ammonia tank cover

WSQ-12 *Please provide a description of what type of cover will be installed over the secondary containment for the ammonia tanks. Please confirm that the ammonia unloading area will be drained into the covered containment area.*

**Response:** PG&E has agreed to install an aluminum (or other suitable material) cover over the ammonia containment basin. This will greatly reduce the rate of an ammonia release to the surrounding area should a spill occur, and further reduce the risk of injury from an accidental release of ammonia. PG&E confirms that drains from the ammonia delivery/unloading area will be plumbed into the covered containment basin.

### **South Bay Elementary School**

WSQ-13 *Please coordinate with South Bay Elementary School regarding notification procedures to the school in the event of a hazardous materials incident at the HBRP.*

**Response:** PG&E will coordinate with the South Bay Elementary School regarding notification procedures in the event of a hazardous materials incident at HBRP and will document this coordination to CEC Staff. As stated at the Data Request Response Workshop held on February 1, 2007, the principal of South Bay Elementary School currently sits on the Community Advisory Board for the Humboldt Bay Power Plant.

# **Soil and Water Resources**

WSQ Responses 14-16

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# Soil and Water Resources (WSQ14-16)

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## Stormwater outfall

WSQ-14 *Please provide an update on the design of the discharge structure to convey stormwater to Buhne Slough.*

**Response:** The design of the discharge structure is underway. PG&E will provide this information in a future submittal.

## Construction drainage plan

WSQ-15 *Please provide a conceptual drainage plan for construction.*

**Response:** The conceptual drainage plan is in development. PG&E will provide this information in a future submittal.

## Mud track-out prevention

WSQ-16 *Please describe how the track-out of mud from the construction site on to King Salmon Avenue will be prevented.*

**Response:** The NCUAQMD has not published rules regarding trackout controls. PG&E proposes to follow and implement trackout controls consistent with the requirements of the San Joaquin Valley Air Pollution Control District Rule 8041, as follows:

5.8 Carryout and trackout shall be prevented and mitigated as specified in sections 5.8.1 and 5.8.2:

5.8.1 Prevented by:

5.8.1.1 Installing and maintaining a trackout control device meeting the specifications contained in Section 5.9 at all access points to paved public roads.

5.9 Specifications for Section 5.8.1 shall meet the following conditions or combination of conditions:

5.9.1 For use of grizzlies or other similar devices designed to removed dirt/ mud from tires, the devices shall extend from the intersection with the public paved road surface for a distance of at least 25 feet, and cover the full width of the unpaved exit surface for at least 25 feet.

5.9.2 For use of gravel pads, coverage with gravel shall be at least one inch or larger in diameter and at least 3 inches deep, shall extend from the intersection with the public paved road surface for a distance of at least 50 feet, and cover the full width of the unpaved exit surface for at least 50 feet. Any gravel deposited onto a public paved road travel lane or shoulder must be removed at the end of the workday or immediately following the last vehicle using the gravel pad, or at least once every 24 hours, whichever occurs first.

5.9.3 For use of paving, paved surfaces shall extend from the intersection with the public paved road surface for a distance of at least 100 feet, and cover the full width of the unpaved access road for that distance to allow mud and dirt to drop off of vehicles before exiting the site. Mud and dirt deposits accumulating on paved interior roads shall be removed with sufficient frequency, but not less frequently than once per workday, to prevent carryout and trackout onto paved public roads

The temporary access road will be 600 feet in length. Although the temporary access road will consist of Class II aggregate rather than pavement, it is consistent with the San Joaquin Valley Air Pollution Control District rule.

# **Traffic and Transportation**

Data Responses 64-65

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# Traffic and Transportation (64-65)

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## Conceptual drawing

64. *Please provide a conceptual drawing consistent with the Humboldt County Public Works Department's requirements showing the proposed encroachment apron for the temporary construction access road to King Salmon Avenue.*

**Response:** Attachment DR64-1 includes a drawing and cross-section of the proposed encroachment apron for the temporary construction access road to King Salmon Avenue. Included with the attachment is an e-mail from Ken Freed of the Humboldt County Public Works Department regarding the County's design requirements for the road.

## Bridge load limit

65. *Please specify the load limit of the King Salmon Avenue bridge crossing over the intake channel. If additional bridge reinforcement is required to accommodate heavy construction equipment and project components, please briefly discuss how the planned work will meet the requirements of the Humboldt County Public Works Department.*

**Response:** Construction access to the site will use the new temporary access road, which turns into the project site south of the King Salmon Avenue bridge that crosses the intake channel. For this reason, it will not be necessary for heavy loads to cross the bridge.

## **Attachment DR64-1**

Proposed Encroachment Apron for the Temporary  
Construction Access Road to King Salmon Avenue

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January 31, 2007

6433.04

Pacific Gas and Electric  
6680 Alhambra Avenue, Suite 431  
Martinez, California 94553

Attention: Mr. Kenneth Horn - Project Development Engineer

Subject: Submittal of Exhibits  
Humboldt Bay Power Plant; 2006-2007 Repowering Project

Dear Mr. Horn:

This letter presents exhibits which have been developed for permitting processes associated with the 2006-2007 Humboldt Bay Power Plant Repowering Project. These exhibits have been developed in order to support the approval of permits required by the Army Corps of Engineers and other regulatory agencies. Please refer to the site plans titled "*Temporary Access Road and Parking Lot Preliminary Design*," submitted on September 8, 2006, for associated locations of King Salmon Avenue and the temporary access road. Structural sections stated within these exhibits are preliminary and may change pending verification of geotechnical assumptions along the western shoulder of King Salmon Avenue, at the entrance to the temporary access road, and at the entrance to the temporary parking area.

Included with this letter are the following exhibits:

- Site map indicating locations of King Salmon Avenue, the entrance to the temporary access road, and the temporary parking area (Figure 1-A).
- Preliminary exhibits of the shoulder of King Salmon Avenue and the entrance apron for the temporary access road (Figures 2-A through 2-C). Included in these exhibits are structural sections consistent with comments from the Humboldt County Public Works Department (HCPWD). Additionally, correspondence between LACO ASSOCIATES (LACO) and the HCPWD discussing Humboldt County roadway requirements has been provided as an attachment to this letter (Attachment 1).
- Preliminary exhibits of the temporary parking area (Figures 3-A through 3-B). Included in the temporary parking area exhibits are a general layout, number of spaces, type of surfacing, clearing and reconstruction necessary to prepare the parking area, notation of foliage to remain as screening, and a structural section for the entrance apron.

Submittal of Exhibits; LACO Project No. 6433.00  
Humboldt Bay Power Plant; 2006-2007 Repowering Project  
January 31, 2007  
Page 2

Please contact us if we can be of any further assistance.

Sincerely,  
LACO ASSOCIATES



Brian Hodgson  
Assistant Engineer



Charles J. Roecklein, P.E.  
RCE 38697, Exp. 03/31/07

BRH:cs

Attachments

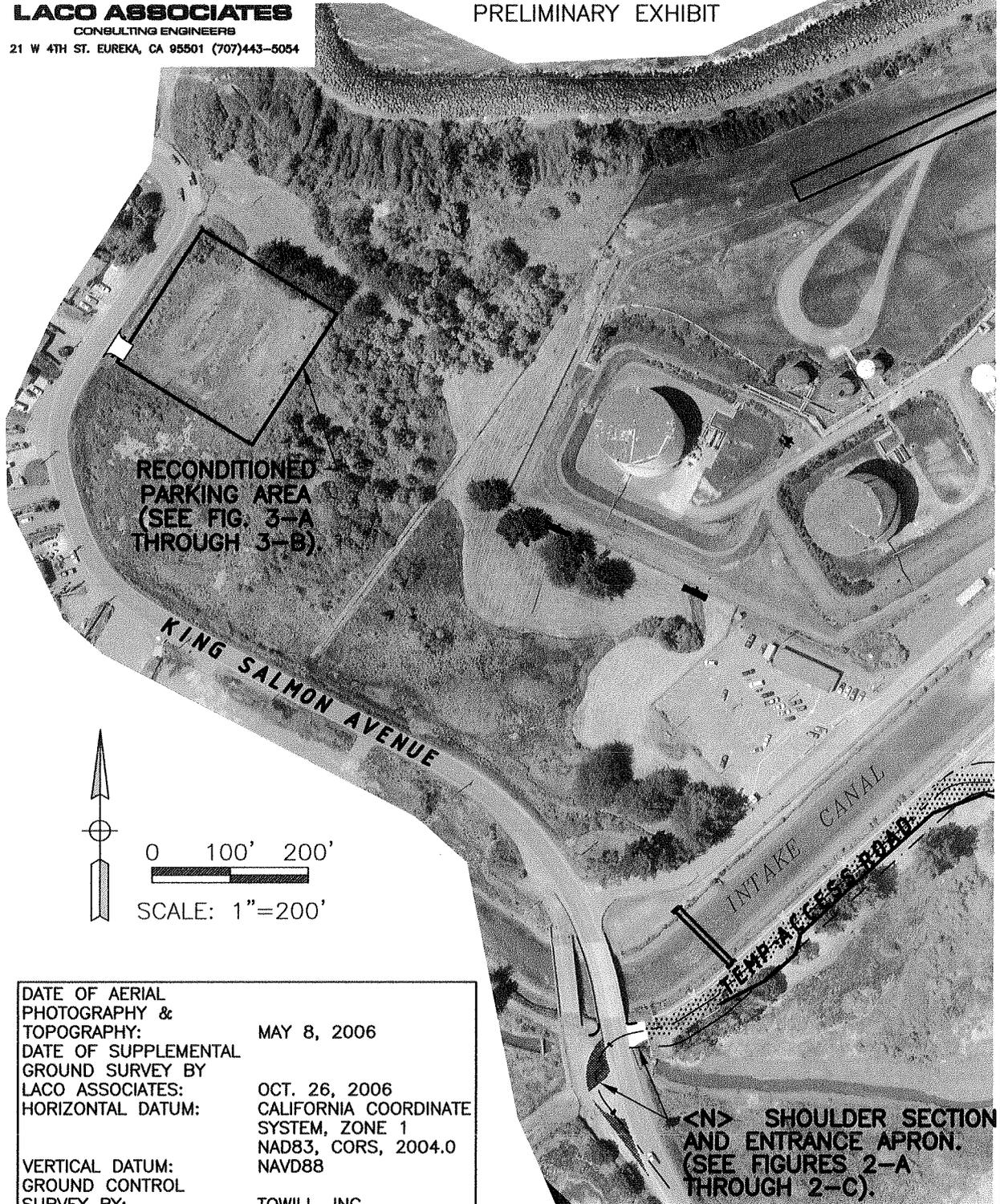
P:\6400\6433 PGE Access Road\Submittals\6433 Letter Report for Entrance Apron and Parking Area.doc



CLIENT	PACIFIC GAS & ELECTRIC	BY	WJP	FIGURE	1-A
LOCATION	HUMBOLDT BAY POWER PLANT	DATE	1/31/07	JOB NO.	6433.04
	SITE MAP	SCALE	1"=200'		

**LACO ASSOCIATES**  
 CONSULTING ENGINEERS  
 21 W 4TH ST. EUREKA, CA 95501 (707)443-5054

PRELIMINARY EXHIBIT



DATE OF AERIAL PHOTOGRAPHY & TOPOGRAPHY:	MAY 8, 2006
DATE OF SUPPLEMENTAL GROUND SURVEY BY LACO ASSOCIATES:	OCT. 26, 2006
HORIZONTAL DATUM:	CALIFORNIA COORDINATE SYSTEM, ZONE 1 NAD83, CORS, 2004.0 NAVD88
VERTICAL DATUM:	
GROUND CONTROL SURVEY BY:	TOWILL, INC.

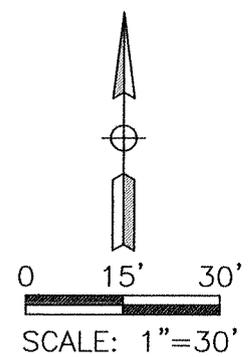
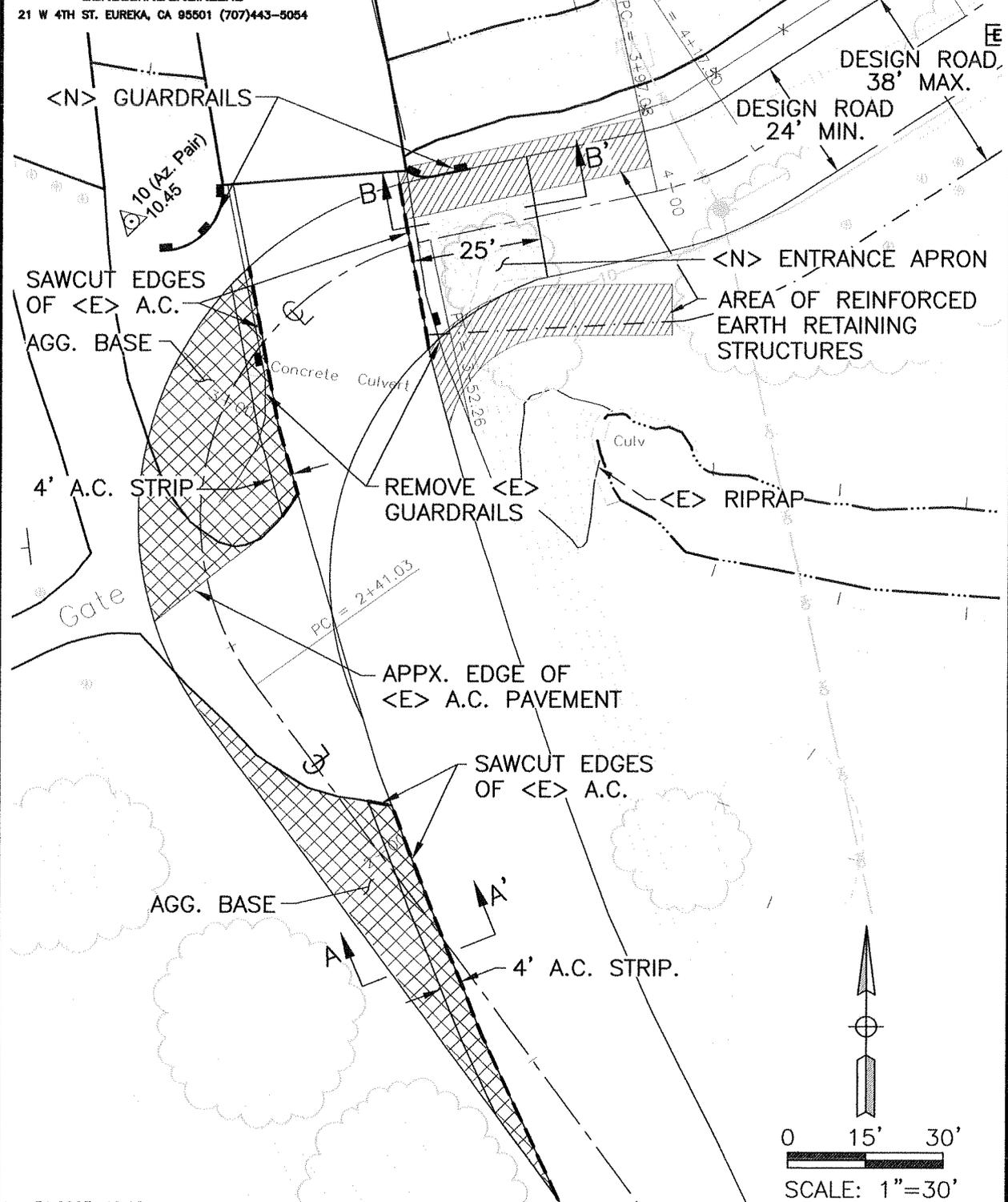
<N> SHOULDER SECTION AND ENTRANCE APRON. (SEE FIGURES 2-A THROUGH 2-C).



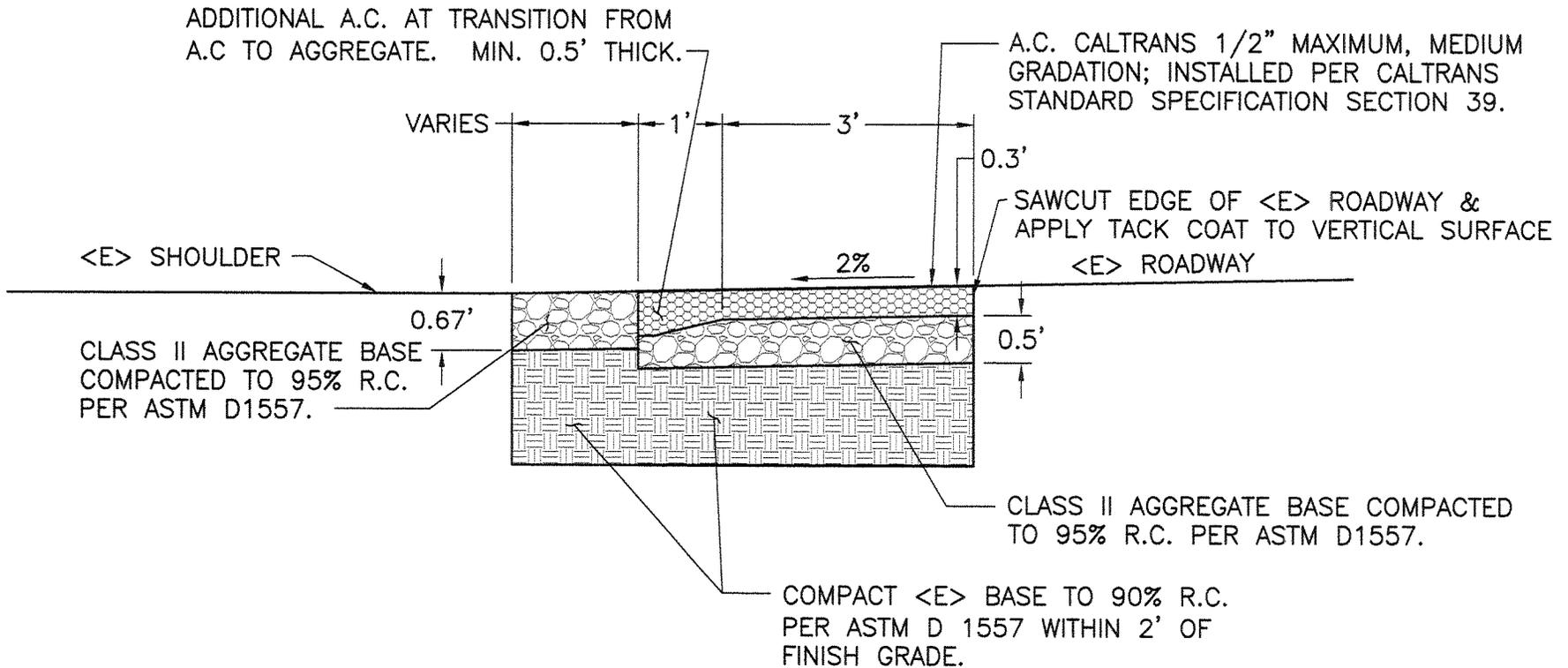
CLIENT	PACIFIC GAS & ELECTRIC	BY	WJP	FIGURE	2-A
LOCATION	HUMBOLDT BAY POWER PLANT	DATE	1/31/07	JOB NO.	6433.04
KING SALMON SHOULDER & ENTRANCE APRON			SCALE	1"=30'	

**LACO ASSOCIATES**  
 CONSULTING ENGINEERS  
 21 W 4TH ST. EUREKA, CA 95501 (707)443-5054

PRELIMINARY EXHIBIT



PRELIMINARY EXHIBIT



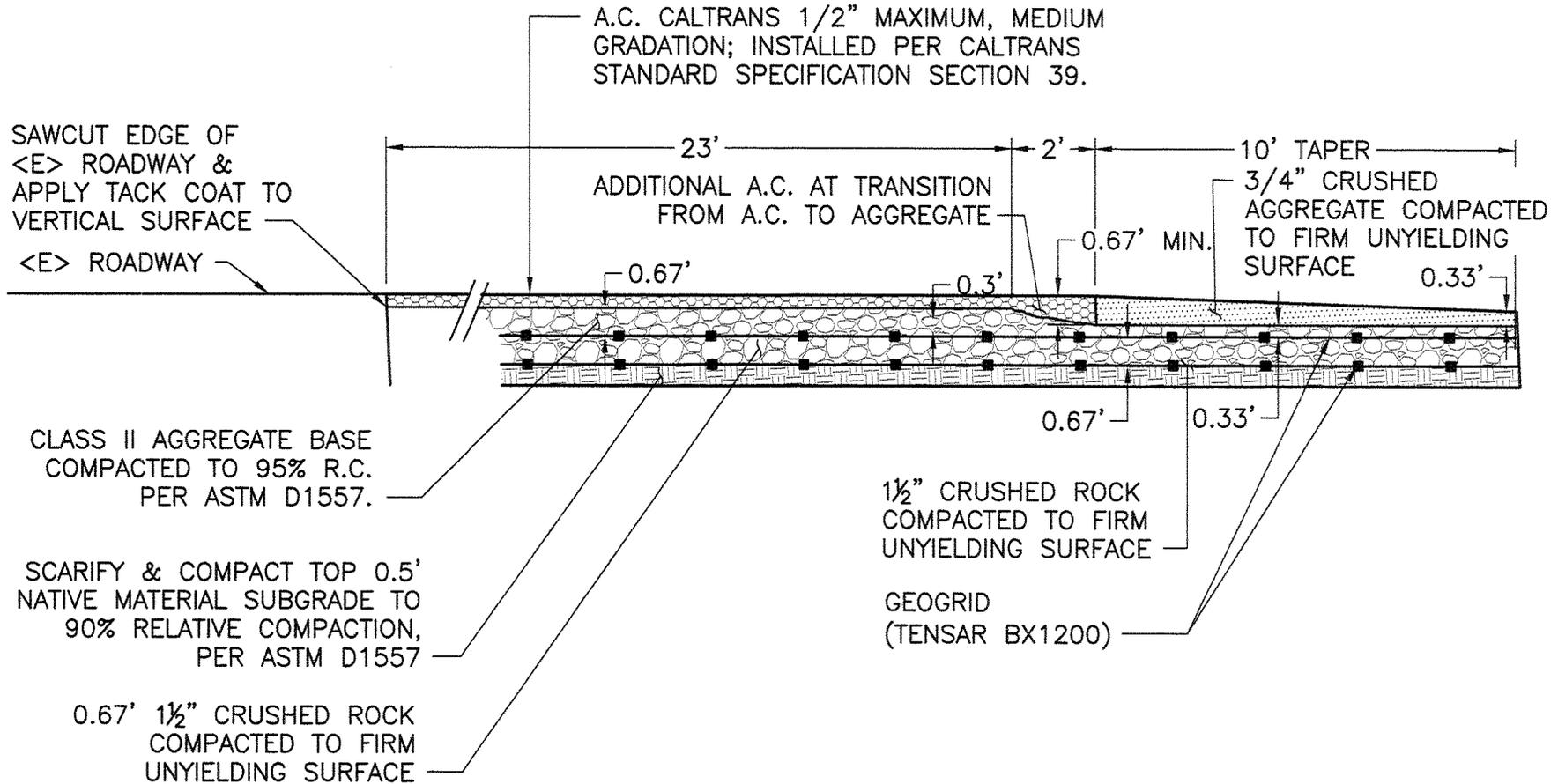
**TYPICAL ROAD SECTION A-A'**

**SCALE: 1"=2'**

 <b>LACO ASSOCIATES</b> CONSULTING ENGINEERS 21 W 4TH ST. EUREKA, CA 95501 (707)443-5054	PROJECT	KING SALMON SHOULDER & ENTRANCE APRON	BY	WJP	FIGURE	2-B	
	CLIENT	PACIFIC GAS & ELECTRIC	DATE	1/31/07	JOB NO.		6433.04
	LOCATION	HUMBOLDT BAY POWER PLANT	CHECK	BRH	SCALE	1"=2'	
	TYPICAL ROAD SECTION						

Jan 31, 2007 -- 11:09am  
 T:\CADFILES\6400\6433 PG&E PwrPrint\dwg\ 6433-CIV-BASE\_2007-1-30.dwg

PRELIMINARY EXHIBIT



**TYPICAL PAVING SECTION B-B'**

**SCALE: 1"=4'**



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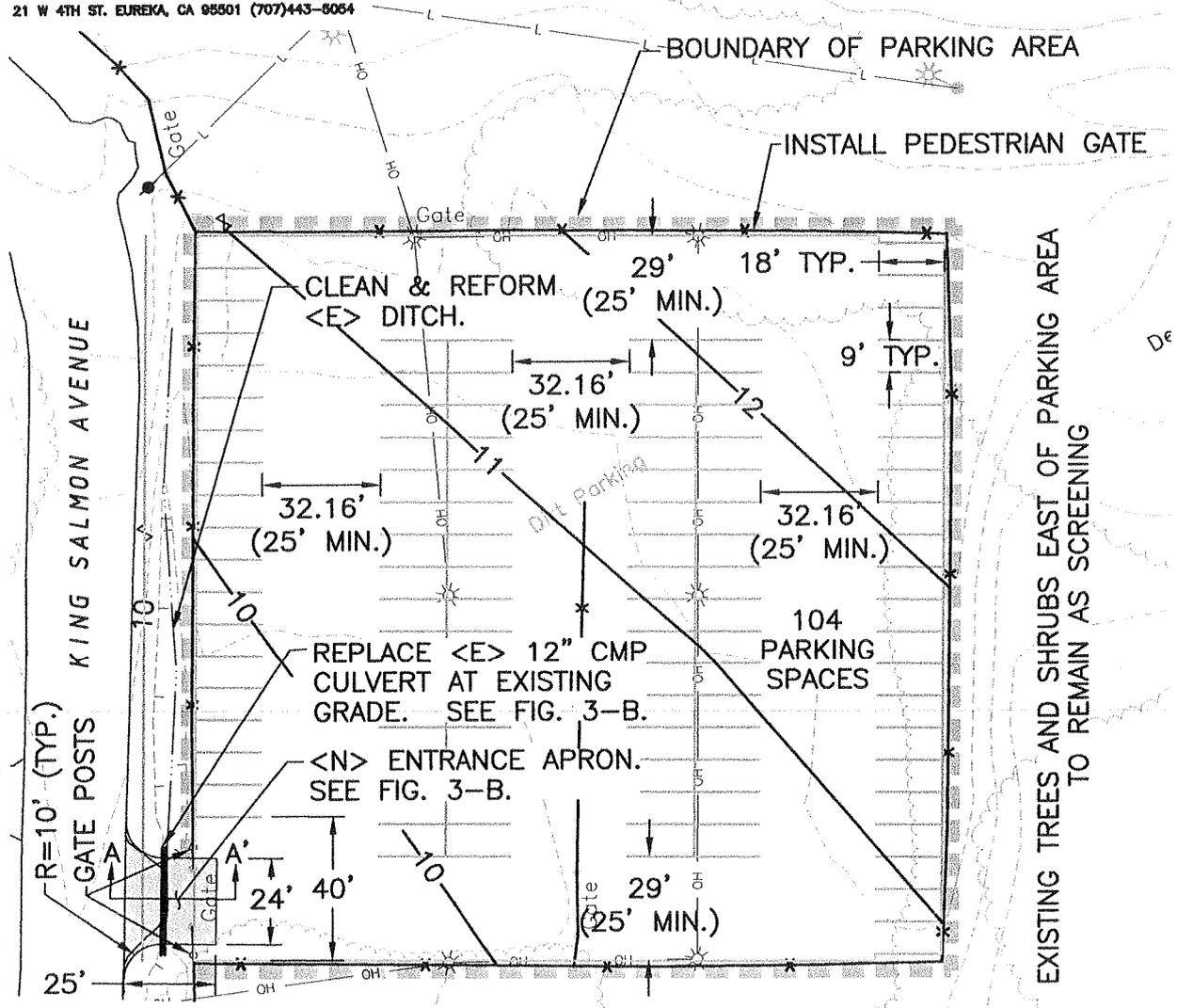
PROJECT	KING SALMON SHOULDER & ENTRANCE APRON	BY	WJP	FIGURE	2-C
CLIENT	PACIFIC GAS & ELECTRIC	DATE	1/31/07		
LOCATION	HUMBOLDT BAY POWER PLANT	CHECK	BRH	JOB NO.	6433.04
	TYPICAL PAVING SECTION	SCALE	1"=2'		



CLIENT	PACIFIC GAS & ELECTRIC	BY	WJP	FIGURE	3-A
LOCATION	HUMBOLDT BAY POWER PLANT	DATE	1/31/07	JOB NO.	6433.04
	NORTHERN PARKING AREA	SCALE	1"=50'		

**LACO ASSOCIATES**  
 CONSULTING ENGINEERS  
 21 W 4TH ST. EUREKA, CA 95501 (707)443-5054

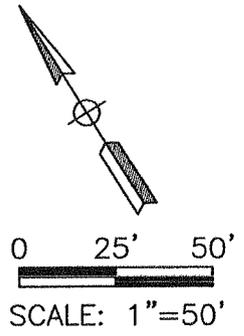
PRELIMINARY EXHIBIT



EXISTING TREES AND SHRUBS EAST OF PARKING AREA TO REMAIN AS SCREENING

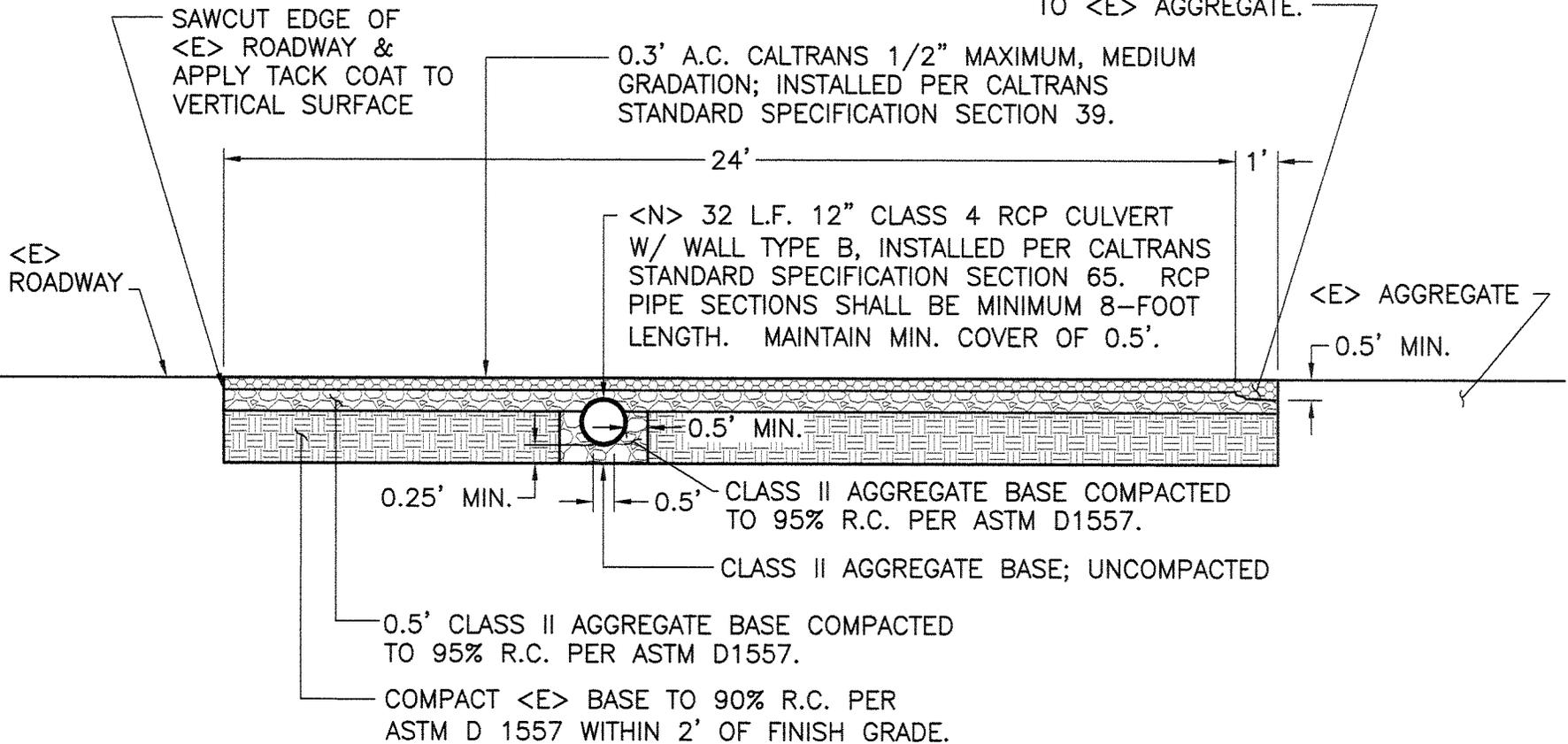
NOTES:

1. CLEAR AND GRUB PARKING AREA; USE CLASS II AGG. BASE TO FILL ANY CAVITIES; SCARIFY TOP 4" OF SURFACE; GRADE AND RECOMPACT TO 90% R.C. PER ASTM D1557.
2. REMOVE EXISTING FENCE AND ON-SITE DEBRIS. INSTALL NEW 6' CHAIN LINK FENCE AROUND PARKING AREA PERIMETER.
3. CONTRACTOR TO PROTECT EXISTING LIGHT POLES & OVERHEAD ELECTRIC LINES.



PRELIMINARY EXHIBIT

ADDITIONAL A.C. AT  
TRANSITION FROM A.C.  
TO <E> AGGREGATE.



**SECTION A-A'**  
**TYPICAL ACCESS APRON W/ CULVERT**

**SCALE: 1"=4'**



**LACO ASSOCIATES**  
CONSULTING ENGINEERS  
21 W 4TH ST. EUREKA, CA 95501 (707)443-5054

PROJECT	NORTHERN PARKING AREA	BY	WJP	FIGURE	3-B
CLIENT	PACIFIC GAS & ELECTRIC	DATE	1/31/07		
LOCATION	HUMBOLDT BAY POWER PLANT	CHECK	BRH	JOB NO.	6433.04
	TYPICAL ACCESS APRON SECTION	SCALE	1"=4'		

# *Attachment 1*

**Brian Hodgson**

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**From:** Freed, Ken [KFreed@co.humboldt.ca.us]  
**Sent:** Thursday, January 25, 2007 11:14 AM  
**To:** Brian Hodgson  
**Subject:** RE: Shoulder and entrance apron cross section along King Salmon Avenue

Brian,

As per our phone conversation, Public Works will require an Encroachment permit will be required to construct and surface the approach area on King Salmon Ave. The approach will need to be surfaced with AC to current County standards a minimum of 25 feet to keep rock, mud, and debris off the County roadway. In addition, the area for truck turning movement will required to surface with AC a strip the length of the turning movement along the County roadway approximately 4 feet in width to protect the edge of the County roadway. The gravel shoulder portion of the truck turning movement shall be compacted to 95% to meet current County standards.

Any questions please call (707) 445-7205

Ken  
Public Works Department - Land Use Division

-----Original Message-----

**From:** Brian Hodgson [mailto:hodgsonb@lacoassociates.us]  
**Sent:** Wednesday, January 24, 2007 11:56 AM  
**To:** Freed, Ken  
**Subject:** Shoulder and entrance apron cross section along King Salmon Avenue

Hi Ken,

Attached is the figure we discussed on the phone. My question concerns the western shoulder of King Salmon Avenue and the entrance apron of the temporary road. What design requirements does Humboldt County require for these areas?

Thank you,  
Brian Hodgson

=====  
Brian Hodgson  
Assistant Engineer

LACO Associates Consulting Engineers, Inc.  
21 West 4th Street, Eureka, CA 95501  
Phone (707) 443-5054, Fax (707) 443-0553  
<http://www.lacoassociates.us>

# **Transmission System Engineering**

WSQ Responses 17-20

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# Transmission System Engineering (WSQ17-20)

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## CAISO approval

WSQ-17 *Please provide documentation of the CAISO's approval of the conceptual System Protection Scheme (SPS).*

**Response:** Attachment WSQ17-1 is a letter dated April 13, 2006 from the CAISO to Mr. John Vardanian of PG&E Generation Interconnection Services granting preliminary interconnection approval to the HBRP. For clarification, the original System Impact Studies (SIS) were initiated by the Ramco Generating Two Humboldt Energy Facility Project. The Humboldt repowering was bid into PG&E's 2004 long-term RFO by a number of bidders. Ultimately, the Ramco project, which utilizes the Wärtsilä equipment, was selected. Because the project will require close coordination with existing fossil fuel and nuclear operations at the site, PG&E concluded that it was in the project's best interest to have the development and permitting by PG&E. On April 7, 2006, an agreement was executed between PG&E and Ramco that assigned all of the rights, title, and interest in the project facilities study plan and interconnection applications from Ramco to PG&E. This letter was provided to CEC Staff in the HBRP AFC Data Adequacy Supplement.

WSQ-18 *Confirm that that the CAISO has approved the Humboldt-Eureka 60 kV line (Humboldt-Harris section) and the 100 MVAR Static VAR Compensator (SVC).*

**Response:** These two items are included in the 2007 CAISO Transmission Plan. The plan can be found at <http://www.caiso.com/1b6b/1b6bb4d51db0.pdf>. The Humboldt-Harris reconductoring is shown as a recommended project in Table 2-2, line 2 on page 37. The 100 MVAR SVC is shown as an Approved Project in Table 2-1, line 20, page 36. Also see additional staff discussion at the bottom of page 107 and Table 6-3. This recommendation/plan was approved by the CAISO Board at their meeting on January 24, 2007. (Note that there are not Minutes posted reflecting this approval until the minutes are approved by the Board.)

WSQ-19 *The CAISO approval of a SPS to address (1) the Category B contingency overload on the Humboldt-Trinity 115 kV line and (2) the dynamic stability and low frequency issues.*

**Response:** Please see Attachment WSQ17-1, which is the April 13 letter from the CAISO to PG&E approving the System Impact Study.

WS-Q20 *Identify the mitigation for the overloads identified on the Humboldt 115/60 kV 1 and 2 transformers and the Bridgeville 115/60 kV transformer.*

**Response:** As the SIS states, these overloads are pre-project issues for which the Project is not responsible. In section 11.4 of the SIS, PG&E identifies that these overloads are mitigated by either the existing operation solutions or existing PG&E projects. For the Humboldt 115/60 kV 1 and 2 transformers, section 11.4.2 of the SIS identifies the following operating solution:

PG&E Operation Plan (Non-T138 Related) stated at an outage of the Humboldt Bay Power Plant Substation 60 kV Bus, trip Essex CB 52, Humboldt CB 12, and/or Humboldt CB 32 for dropping loads. If necessary, use MEPPs. These measurements will mitigate the overload on these banks.

For the Bridgeville 115/60 kV transformer, section 11.4.3 of the SIS identifies the following operating solution:

Drop loads are the operation solution to mitigate this overload and/or by inserting the MEPPs units and turning on the synchronous condenser at HBPP.

**Attachment WSQ17-1**  
CAISO Letter Granting Preliminary  
Interconnection Approval to the HBRP

---



California Independent  
System Operator

April 13, 2006

Gary DeShazo  
Director of Regional Transmission – North  
(916) 608-5880

Mr. John Vardanian  
PG&E Generation Interconnection Services  
245 Market Street, Room 775, Mail Code N7L  
San Francisco, CA 94105-1814

**Subject: Ramco Generating Two Humboldt Energy Facility Project  
Preliminary Interconnection Approval**

Dear Mr. Vardanian:

The California ISO (CAISO) has reviewed the System Impact Study (SIS) for the Ramco Generating Two, Humboldt Energy Facility Project located in Humboldt county, California. The SIS was conducted by Pacific Gas and Electric Company (PG&E) at the request of the Ramco Generating Two (Ramco) to replace the existing PG&E's Humboldt Bay plant. The project consists of ten reciprocating engine generators, each rated at 16.638 MW, with a plant auxiliary load of 3.65 MW, for a maximum net output to the grid of 162.73 MW. The project's requested COD is August, 2008.

Based on the results of the SIS, the CAISO is granting preliminary interconnection approval to the Humboldt Energy Facility Project.

Please note that this letter approving the interconnection of the project allows the project to connect to the CAISO Controlled Grid and to be eligible to deliver the project's output using available transmission. However, it does not establish the generation project's level of deliverability for purposes of determining its Net Qualifying Capacity under the CAISO Tariff and in accordance with CPUC-adopted Resource Adequacy Rules. Therefore, this letter makes no representation, and Ramco cannot rely on any statements herein, regarding the ability, or amount, of the output of the project to be eligible to sell Resource Adequacy Capacity. We encourage you to follow the baseline deliverability studies ongoing at the CAISO. For more information on generation deliverability, please reference the web links provided in the attachment to this letter.

If you have questions about the CAISO review of this study, please contact Paul Didsayabutra at (916) 608-1281 (<mailto:pdidsayabutra@caiso.com>) or myself at (916) 608-5880 (<mailto:gdeshazo@caiso>).

Sincerely,

*Original signed by Gary L. DeShazo*

Gary DeShazo  
Director of Regional Transmission - North

cc: Gary Veerkamp (Ramco via e-mail <mailto:garyveer@sbcglobal.net>)  
Kent Fickett (Ramco via e-mail <mailto:k.fickett@comcast.net>)  
Karen Grosse (PG&E via e-mail, [mailto: KRG6@pge.com](mailto:KRG6@pge.com))  
John Vardanian (PG&E via e-mail, [mailto: JAV7@pge.com](mailto:JAV7@pge.com))  
Albert Wong (PG&E via e-mail, [mailto: AYW1@pge.com](mailto:AYW1@pge.com))  
Madeline Aldridge (PG&E via e-mail, [mailto: MEG5@pge.com](mailto:MEG5@pge.com))

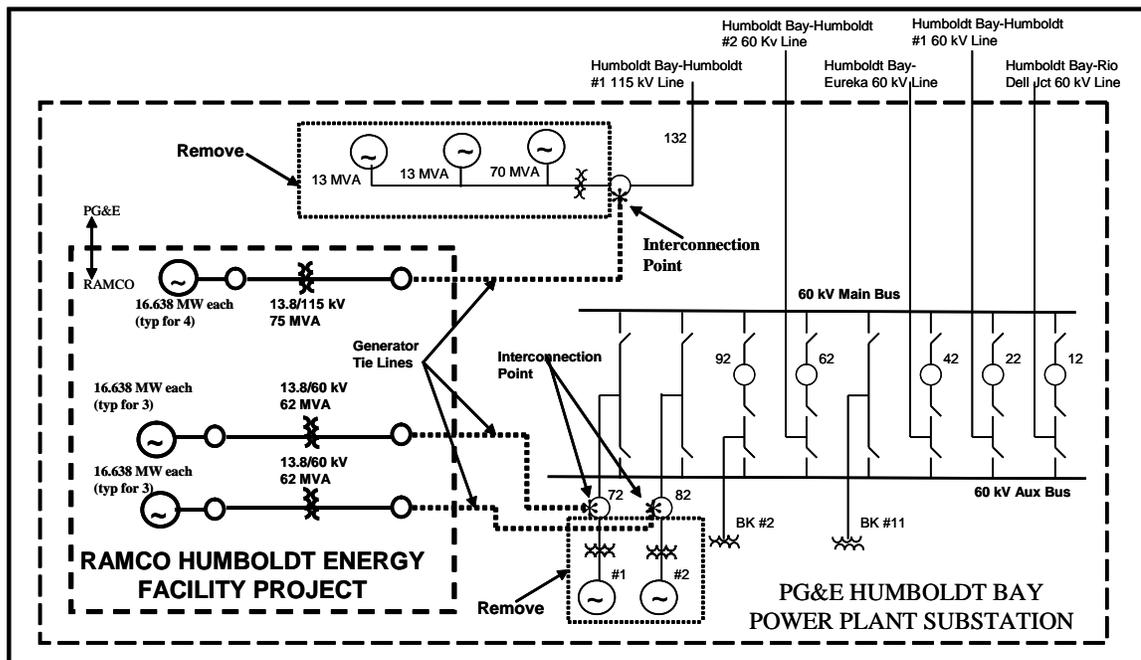
Armando Perez (ISO)  
Dariush Shirmohammadi (ISO)  
Donna Jordan (ISO via e-mail)  
Judy Nickel (ISO via e-mail)  
Gary Brown (ISO via e-mail)  
Tom French (ISO via e-mail)  
Regional Transmission - North (ISO via e-mail)

## Attachment

The attachment provides a summary of the project, along with CAISO comments.

### Project Overview:

The proposed Humboldt Energy Facility Project will replace the existing PG&E's Humboldt Bay plant. The project consists of ten reciprocating engine generators, each rated at 16.638 MW, with a plant auxiliary load of 3.65 MW, for a maximum net output to the grid of 162.73 MW. The project's requested COD is August, 2008.



Conceptual One-line Diagram

### Summary of the System Impact Study (SIS) Results

The SIS concluded that the addition of the project would not cause normal (N-0) overloads to existing transmission facilities. However, the project could cause one new Category "B" and one new Category "C" emergency overload on the Humboldt-Trinity 115 kV Line # 1 under summer off-peak conditions. The mitigation plans could involve reducing number of generators on the 115 kV system from 4 to 3 (total generation reduction of 16.63 MW) or reconductoring the Humboldt-Trinity 115 kV line #1.

In addition to the new overloads, the project would exacerbate five pre-existing Category C as shown in the next page. These pre-existing overloads are mitigated by either the existing operation solutions or existing PG&E projects.

- The Humboldt Bay-Eureka 60 kV Line #1. The project could exacerbate the overload on this line up to 2% under summer and winter peak conditions.
- The Humboldt 115/60 kV Transformer #1. The project could exacerbate the overload on this line by 4% under winter peak conditions.
- The Humboldt 115/60 kV Transformer #2. The project could exacerbate the overload on this line by 7% under winter peak conditions.
- The Bridgeville 115/60 kV Transformer #1. The project could exacerbate the overload on this line by 6% under winter peak conditions.

The short circuit, system protection and substation evaluation identified no breakers or substation equipment that would become overstressed due to the addition of the project.

The dynamic stability study results determined that the addition of the project would cause frequency criteria violations at several 60 kV buses. In addition, the outages of Humboldt 115 kV bus outage and Humboldt-Rio Dell 60 kV line outage could cause transmission system unstable. The mitigation plans for dynamic problems will be developed in the facility study phase as a requirement for receiving final approval.

#### CAISO Comments:

Based on the results of the SIS, the CAISO is granting preliminary interconnection approval to the Humboldt Energy Facility Project.

Please note that this letter approving the interconnection of the project allows the project to connect to the CAISO Controlled Grid and to be eligible to deliver the project's output using available transmission. However, it does not establish the generation project's level of deliverability for purposes of determining its Net Qualifying Capacity under the CAISO Tariff and in accordance with CPUC-adopted Resource Adequacy Rules. Therefore, this letter makes no representation, and Ramco cannot rely on any statements herein, regarding the ability, or amount, of the output of the project to be eligible to sell Resource Adequacy Capacity.

We encourage you to follow the baseline deliverability studies ongoing at the CAISO. For more information on generation deliverability, please reference the following web links:

<http://www.caiso.com/1796/17969a066d030.pdf>

<http://www.caiso.com/docs/2005/05/03/200505031708566410.pdf>

<http://www.caiso.com/docs/2005/05/03/200505031704315525.pdf>

# **Visual Resources**

## Data Responses 66-74

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# Visual Resources (66-74)

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## Building removal

66. Please provide the following:

- a) A photo-simulation of the appearance of the HBRP site, following removal of all buildings slated for demolition, from the KOP2 location. Include appearance of landscape screening after five years of growth.
- b) Include an estimated timeline for all buildings to be removed, including demolition of Units 1 and 2, and those structures associated with the Unit 3 decommissioning process.

## Response:

- (a) Figure DR66-1 shows the HBRP site as it would appear after Units 1, 2, and 3 have been demolished, and assuming 5 years of landscape screening growth. It is important to note that the schedule for the demolition of Units 1, 2, and 3 has not yet been determined.
- (b) The HBRP will involve the demolition of certain structures that must be removed to make room for the HBRP facilities. The demolition of Units 1 and 2 and the decommissioning of Unit 3 are not part of the HBRP project. The schedule for their demolition depends on several factors beyond the control of the HBRP project and will be determined through the NRC's decommissioning process.

**Units 1 and 2**— Construction of the HBRP will directly result in the cessation of operation and surrendering of the air permits for Units 1 and 2 and the MEPPs. However, the HBRP will not directly result in the demolition of any of the structures and associated equipment that comprises Units 1 and 2 for the following reasons:

- Demolition of the structures and associated equipment for Units 1 and 2 is not necessary to construct the HBRP.
- Some of the Unit 1 and 2 infrastructure is shared by Unit 3 and cannot be removed without approval of the decommissioning plans for Unit 3.
- The demolition of Units 1 and 2 has an identified separate and distinct source of funding approved by the CPUC in a separate proceeding from the current CPUC proceeding under the Long-Term Request for Offers (LTRFO) process.

**Unit 3**— The decommissioning of Unit 3 is under the jurisdiction of the NRC. The process for obtaining NRC approval for the decommissioning of Unit 3 is lengthy and is discussed in detail in Section 2.2.2 of the AFC.

The decommissioning and demolition of Unit 3 are not a consequence of the HBRP project and are entirely separate from it in both a regulatory and administrative sense.

The final schedule for Unit 3 decommissioning and demolition activities is uncertain due to the activities and approvals required by the NRC. Given that Units 1, 2, and Unit 3

share some infrastructure components, a specific schedule for the demolition of Units 1 and 2 has not yet been determined.

## Landscape plan

67. *Please provide the following:*

- a) *A conceptual landscape plan that will demonstrate the screening objectives identified in the AFC and compliance with the Humboldt County General Plan, Zoning Ordinance, and Local Coastal Plan. The plan shall identify the tree and shrub species, as well as any other measures (e.g. berms, masonry walls, etc.), that are being proposed to screen the facilities.*
- b) *A table with the landscape plan that identifies for each species proposed, the numbers of plants to be used, their sizes when planted (container size and height), their growth rates (feet per year), and their maximum height and spread.*

**Response:** Attachment DR67-1 is the conceptual landscape plan and the table of growth rates for each species proposed.

## Landscaping timeframe

68. *Please indicate a timeframe for installation of the HBRP landscaping.*

**Response:** Landscaping of the project site will begin as soon as plant construction is completed and the plant is in commercial operation.

## Tree removal

69. *Please discuss the necessity of removing trees and vegetation that screen the front of existing facilities, as viewed from King Salmon Avenue (KOP2). Identify alternatives for retaining vegetative screening, such as reconfiguring the site layout.*

**Response:** A detailed engineering analysis of project access logistics has determined that it is necessary to remove these trees. There are no feasible alternatives to reconfigure the site layout to retain these trees.

## Construction lighting

70. *Please discuss the location and use of construction lighting for this project. Identify and evaluate potential impacts to surrounding areas and propose mitigation, as appropriate.*

**Response:** There are five areas where construction lighting will be used for the HBRP. They are:

- Temporary access road and primary parking lot
- Project site
- Laydown area
- Temporary remote parking area
- Construction worker pedestrian access trail



Existing View from King Salmon Avenue near Highway 101 looking north



Simulation of proposed project with removal of Units 1, 2, and 3 and landscaping at five years of maturity

**FIGURE DR66-1**  
**EXISTING VIEW AND VISUAL SIMULATION**  
**FROM KING SALMON AVENUE - KOP2**  
 HUMBOLDT BAY REPOWERING PROJECT  
 HUMBOLDT COUNTY, CALIFORNIA

**Temporary Access Road and Primary Parking Lot**— Construction lighting will be used along the temporary access road and primary parking area for the duration of HBRP construction. The access road and parking area are located along the south side of the Humboldt Bay Power Plant intake canal. The lighting is necessary to ensure the safety of drivers using the road and parking area. The access road to the Humboldt Bay Power Plant is located along the north side of the intake canal and lighting is provided along that road for the same purpose. As a result, the lighting for the temporary access road and primary parking lot will not add lighting within an area that is not already illuminated. However, the lights along the HBRP access road and parking area will be hooded and directed downward so that significant light or glare will be minimized. The lights will be located on individual poles, which will be removed after construction of the HBRP is complete.

**Project Site**— The construction activities on the HBRP project site requiring lighting will occur once the engine hall building has been constructed and will be limited to activities within the engine hall. This lighting will not be visible from outside of the building.

The one exception to this is the off-loading of the Wärtsilä 18V50DF engines when they arrive on the HBRP site. Due to the size of the engines, the California Highway Patrol will require they be transported at night. The engines will be trucked to the site one at a time from the dock in Fields Landing. When they arrive at the HBRP site, portable temporary lights will be used while the engines are off-loaded from the transport vehicle and moved into the engine hall.

Five engines will be shipped from Finland to Humboldt Bay at one time. One engine per night will be transported from Fields Landing to the HBRP site. The second shipment of five engines will arrive four to six weeks after the first shipment. The use of the portable lights will be limited to approximately 5 days with each shipment. The portable lights will be positioned toward the project site where the off-loading of the engines is occurring. The lights will also be directed downward as much as possible.

**Laydown Area**— When work is occurring at night in the engine hall, lighting will be required in the laydown area to enable workers to obtain needed equipment. The laydown area lights will be located on poles within the laydown area and will only be used when nighttime construction activity is occurring.

The lights will blend in with the existing lighting of the Humboldt Bay Power Plant. The laydown area lights will be less intrusive, however, because the lights will be hooded and directed downward so that significant light or glare will be minimized.

**Temporary Remote Parking Area**— The temporary remote parking area will have construction lighting, which will be used when necessary. There are existing pole and light fixtures in the parking area from when PG&E previously used it. However, the light fixtures will be replaced with fixtures that are hooded and directed downward.

The temporary remote parking area will be used when the number of construction workers exceeds the number of available spaces in the primary parking area. This is estimated to be approximately nine months out of the eighteen-month construction period. In addition, the lights in the temporary remote parking area will be used only when needed. They will not be used if there is sufficient natural lighting to enable workers to safely enter and exit the parking area. Nevertheless, the lights will be visible from residents on King Salmon Avenue

across from the parking area. In addition to using hooded fixtures, PG&E will add shields to the lights where appropriate to further mitigate the visibility of the lights from the King Salmon Avenue residents. The specific lights to be shielded will be determined in a construction lighting plan, which will be submitted to the CEC prior to construction of the HBRP.

**Construction Worker Pedestrian Access Trail**— The construction worker pedestrian access trail will extend from the temporary remote parking area to the temporary construction access road. This is depicted in AFC Figure 2.3-1. PG&E previously used the pedestrian access trail for construction projects at the Humboldt Bay Power Plant that required the use of the temporary remote parking area. There are existing lights along the trail. The lights are not hooded; however, they are screened by existing vegetation. Prior to construction of the HBRP, PG&E will determine whether any of the lights are visible from residents on King Salmon Avenue. If a light is visible, it will be replaced with a hooded fixture. Shields will also be installed if necessary. This information will be detailed in a construction lighting plan, which will be submitted to the CEC prior to construction of the HBRP.

## Construction screening

71. *Please discuss any screening that would be installed surrounding the construction laydown/parking areas to reduce the visibility of materials, equipment, and vehicles from the adjacent roadways and the shoreline trail. Indicate whether these temporary construction facilities would be used beyond the HBRP construction window and identify a timeline for revegetation of these areas.*

**Response:** There are three areas that will be used for construction parking and one area for equipment laydown. They are depicted on AFC Figure 2.3-1 and discussed below.

**Primary Parking Area**— The primary parking lot will be located at the north end of the temporary access road, on the east side of the Humboldt Bay Power Plant, south of the intake channel. The parking lot will be located within the same viewshed as the existing Humboldt Bay Power Plant. It is approximately 600 feet north of King Salmon Avenue at its nearest point and will be visible primarily when seen at close range along a limited segment of King Salmon Avenue. Given the viewshed in which the parking area is located and the short duration for which it will be used, PG&E does not propose the use of temporary screening.

Both the parking area and the access road leading to it will be removed after construction of the HBRP. The area will then be recontoured and revegetated with native species. The parking area and access road will not be used for demolition activities associated with the Humboldt Bay Power Plant.

**Temporary Remote Construction Parking Area**— The second parking area for the HBRP is located along King Salmon Avenue. This temporary remote construction parking area will be used when the primary parking area is full. This estimated to be nine months out of the eighteen-month construction period. The remote parking area may also be used for the staging of equipment. The area has previously been used by PG&E for Humboldt Bay Power Plant construction projects. It will be visible to drivers heading in both directions on King Salmon Avenue, as well as from residences and businesses on King Salmon Avenue.

However, given the short-term use of the parking area, PG&E does not propose to install temporary screening.

**Short-Term Delivery Parking**— The short-term delivery parking area is located on the south side of King Salmon Avenue. This area may be used for additional craft parking or as a temporary parking area for delivery vehicles, if necessary. Portions of this parking area are already used for parking by adjacent businesses and individuals using the private boat docks. PG&E anticipates this area would be used infrequently during HBRP construction and does not propose the use of temporary screening.

**Construction Laydown Area**— The construction laydown area is located north of the HBRP project site within the boundaries of the Humboldt Bay Power Plant. It is located near a coastal access path. The path is placed on rip-rap and is difficult to traverse. It is primarily used for fishing and, as such, users of the path are focused on views of the Bay rather than the Humboldt Bay Power Plant. The path is not heavily used, particularly along the section adjacent to the laydown area.

The laydown area will be visible from the shoreline path. However, also visible from the path is the Humboldt Bay Power Plant and associated infrastructure. The view of the laydown area will not be incongruent with the viewshed. As a result, PG&E does not propose to use temporary screening.

The laydown area will not be restored after construction of the HBRP. PG&E intends to use it for laydown for the demolition of Units 1, 2, and 3.

## Temporary parking area

72. *Please provide a general layout for the proposed temporary parking area along the north side of King Salmon Avenue, including number of spaces and type of surfacing. Discuss the extent of clearing and reconstruction necessary to prepare the lot for temporary parking use. Address plans for protection and retention of mature evergreen screening at the back (east portion) of the lot or alternatives to any proposed removal. Note the location of current or proposed encroachments onto King Salmon Avenue that would be used to access the site.*

**Response:** Attachment DR72-1 provides a general layout for the proposed temporary parking area along the north side of King Salmon Avenue. The parking area will consist of 104 parking spaces. The vegetation within the parking area will be cleared and grubbed prior to use. Class II aggregate base will be used to fill any cavities within the existing parking area. New chain-link fence will be installed around the perimeter and a pedestrian access gate will be installed between the parking area and the construction worker pedestrian access trail. None of the mature evergreen trees on the northeast side of the parking area will be removed. They are located outside of the perimeter of the parking area. Nevertheless, PG&E will install temporary protective fencing at the base of the trees to ensure they are protected during construction.

## Parking area fencing

73. *Please discuss any fencing or temporary screening that would be installed surrounding the parking area to reduce the visibility of materials, equipment, and vehicles from the adjacent roadways, as noted in Data Request #68 above.*

**Response:** Please refer to the response to Data Request 71.

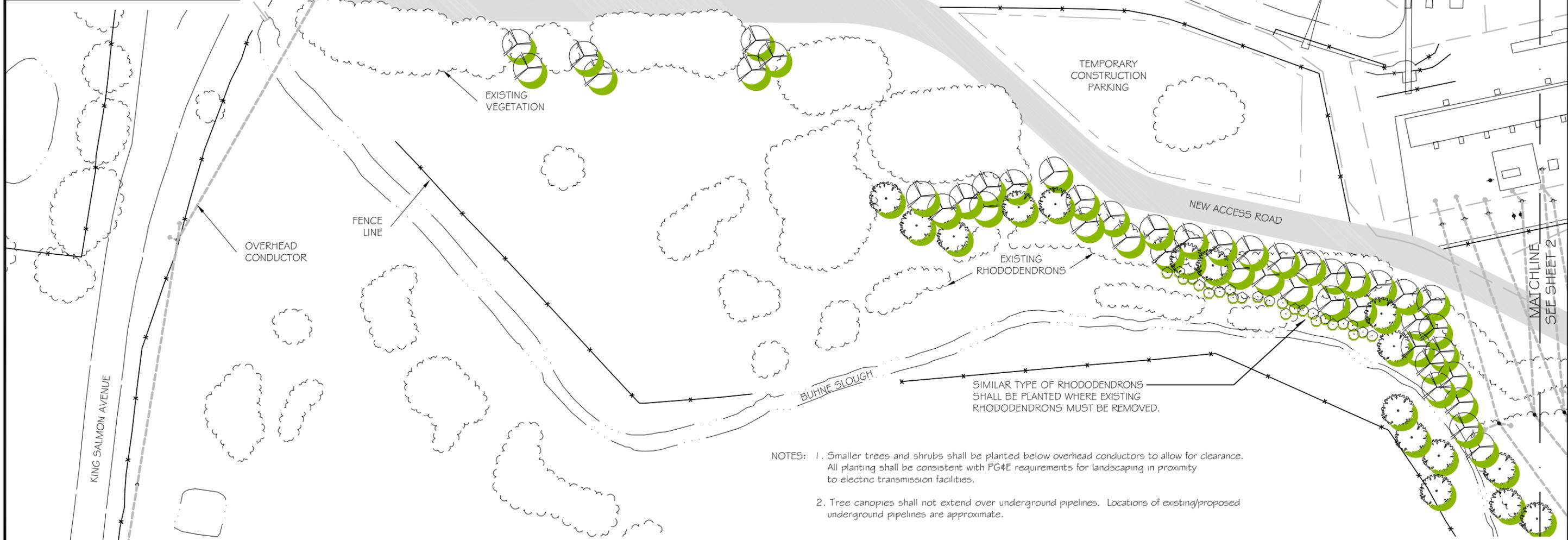
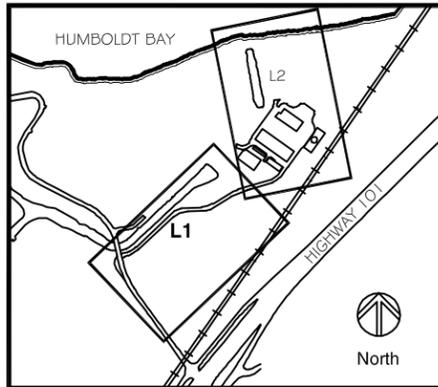
## Future use of the parking area

74. *Please identify plans for use of that portion of the parking area following completion of construction that would not be converted to salt marsh, adjacent to the portion that would be converted to wetlands under PG&E's proposed Mitigation Area 1.*

**Response:** The temporary remote parking area was previously used by PG&E for construction of other projects at the Humboldt Bay Power Plant. PG&E wants a portion of the parking area to remain as such to accommodate workers associated with the decommissioning and demolition activities associated with Units 1, 2, and 3.

## **Attachment DR67-1**

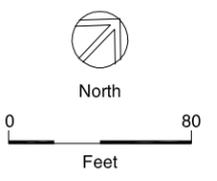
Conceptual Landscape Plan and Table of Growth Rates



- NOTES: 1. Smaller trees and shrubs shall be planted below overhead conductors to allow for clearance. All planting shall be consistent with PG&E requirements for landscaping in proximity to electric transmission facilities.
2. Tree canopies shall not extend over underground pipelines. Locations of existing/proposed underground pipelines are approximate.

PLANT PALETTE LEGEND

SYMBOL	TYPE OF PLANT	SUGGESTED SPECIES	NUMBER INSTALLED	CONTAINER SIZE/ PLANTED HEIGHT	GROWTH RATE	APPROXIMATE MAXIMUM HEIGHT/SPREAD
	Broad leaf evergreen canopy tree	Arbutus menziesii Lithocarpus densiflorus Myrica californica Umbellularia californica	33	15 Gallon/6 Feet	2'/YR 2'/YR 2'/YR 1'-2'/YR	65/60' 65/35' 25/25' 65/65'
	Coniferous evergreen tree	Picea sitchensis Pseudotsuga menziesii Sequoia sempervirens Thuja plicata	105 25	15 Gallon/6 Feet 24" Box/10 Feet	2'/YR 2'/YR 3'/YR 2'-3'/YR	>65/25' >65/25' >65/30' >65/30'
	Large evergreen shrubs	Ceanothus thyrsiflorus Rhamnus californica Rhododendron macrophyllum	40	10 Gallon/3 Feet	2'/YR 2'/YR 1'-2'/YR	10/12' 20/8' 15/15'
	Small to medium evergreen shrubs	Ceanothus gloriosus Baccharis pilularis Garrya elliptica Lupinus arboreus	133	5 Gallon/1'-6" Feet	2'/YR 1'/YR 2'/YR 3'/YR	3/8' 2/6' 6/6' 6/6'





MATCHLINE  
SEE SHEET

NEW SWITCHYARD

NEW POWER HOUSE

UNDERGROUND CONDUIT

DISCHARGE CANAL

FENCE LINE

NEW RADIATOR AREA

STACKS

STACKS

CONSTRUCTION LAYDOWN AREA

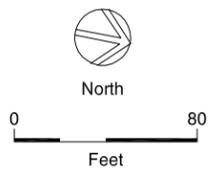
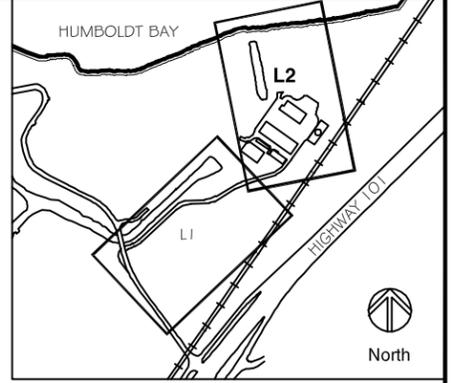
SHRUBS ON TRAIL SIDE OF FENCE  
GROUPINGS OF TREES ON INTERIOR

PLANT

EXISTING VEGETATION

- NOTES:
1. See Sheet 1 for plant palette legend.
  2. Smaller trees and shrubs shall be planted below overhead conductors to allow for clearance. All planting shall be consistent with PG&E requirements for landscaping in proximity to electric transmission facilities.
  3. Tree canopies shall not extend over underground pipelines. Locations of existing/proposed underground pipelines are approximate.

ENVIRONMENTAL VISION  
2-7-2007



**DRAFT**  
**LANDSCAPE PLAN - SHEET 2 OF 2**  
HUMBOLDT BAY REPOWERING PROJECT  
HUMBOLDT COUNTY, CALIFORNIA

**CH2M HILL**

## **Attachment DR72-1**

General Layout for the Proposed Temporary Parking  
Area Along the North Side of King Salmon Avenue

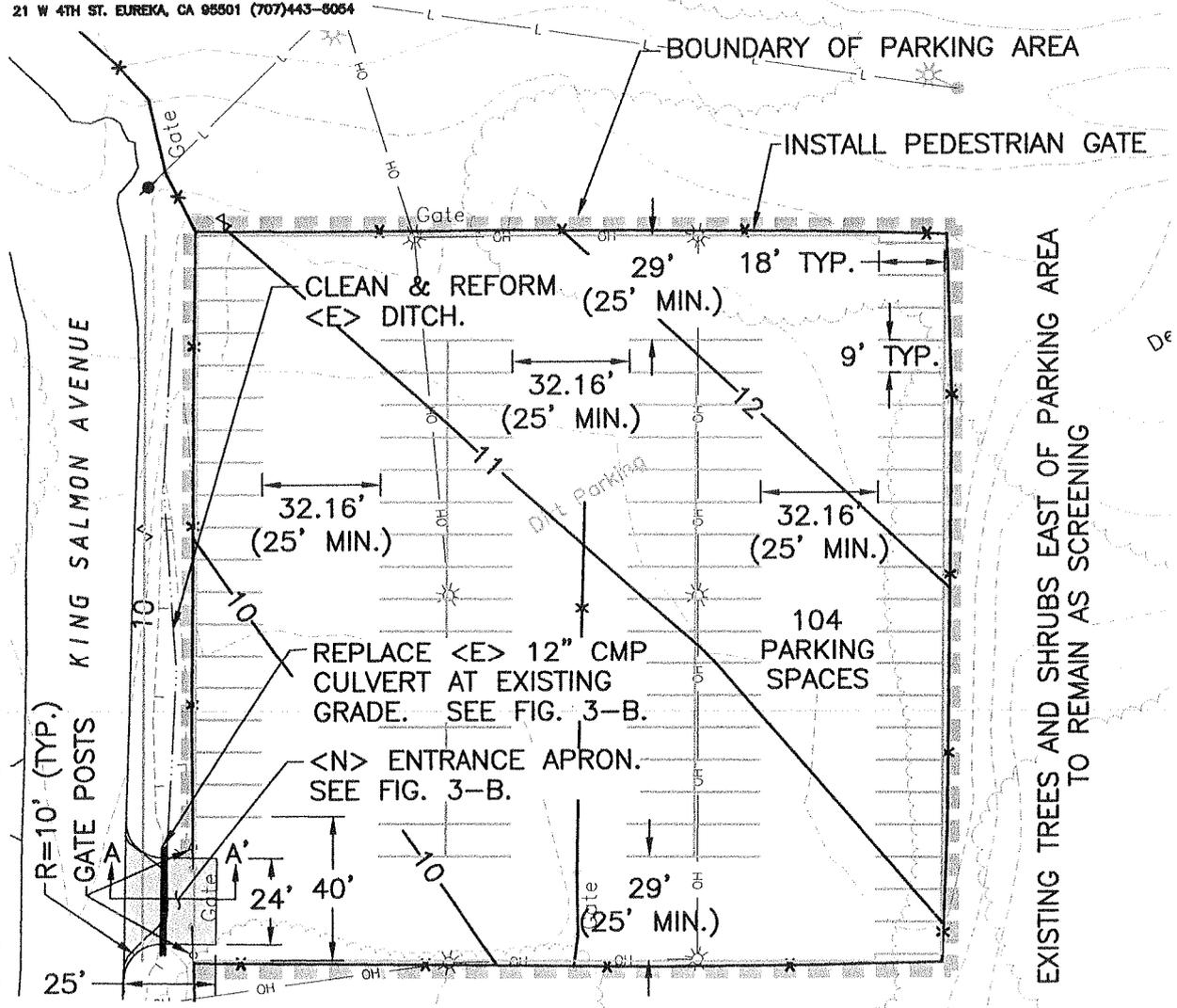
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CLIENT	PACIFIC GAS & ELECTRIC	BY	WJP	FIGURE	3-A
LOCATION	HUMBOLDT BAY POWER PLANT	DATE	1/31/07	JOB NO.	6433.04
	NORTHERN PARKING AREA	SCALE	1"=50'		

**LACO ASSOCIATES**  
 CONSULTING ENGINEERS  
 21 W 4TH ST. EUREKA, CA 95501 (707)443-8064

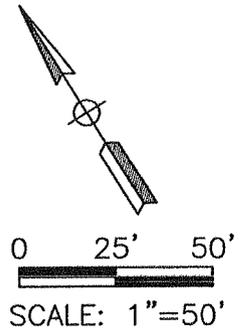
PRELIMINARY EXHIBIT



EXISTING TREES AND SHRUBS EAST OF PARKING AREA TO REMAIN AS SCREENING

NOTES:

1. CLEAR AND GRUB PARKING AREA; USE CLASS II AGG. BASE TO FILL ANY CAVITIES; SCARIFY TOP 4" OF SURFACE; GRADE AND RECOMPACT TO 90% R.C. PER ASTM D1557.
2. REMOVE EXISTING FENCE AND ON-SITE DEBRIS. INSTALL NEW 6' CHAIN LINK FENCE AROUND PARKING AREA PERIMETER.
3. CONTRACTOR TO PROTECT EXISTING LIGHT POLES & OVERHEAD ELECTRIC LINES.



**Waste Management**  
WSQ Response 21

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# Waste Management (WSQ21)

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## Phase II Site Assessment sampling map

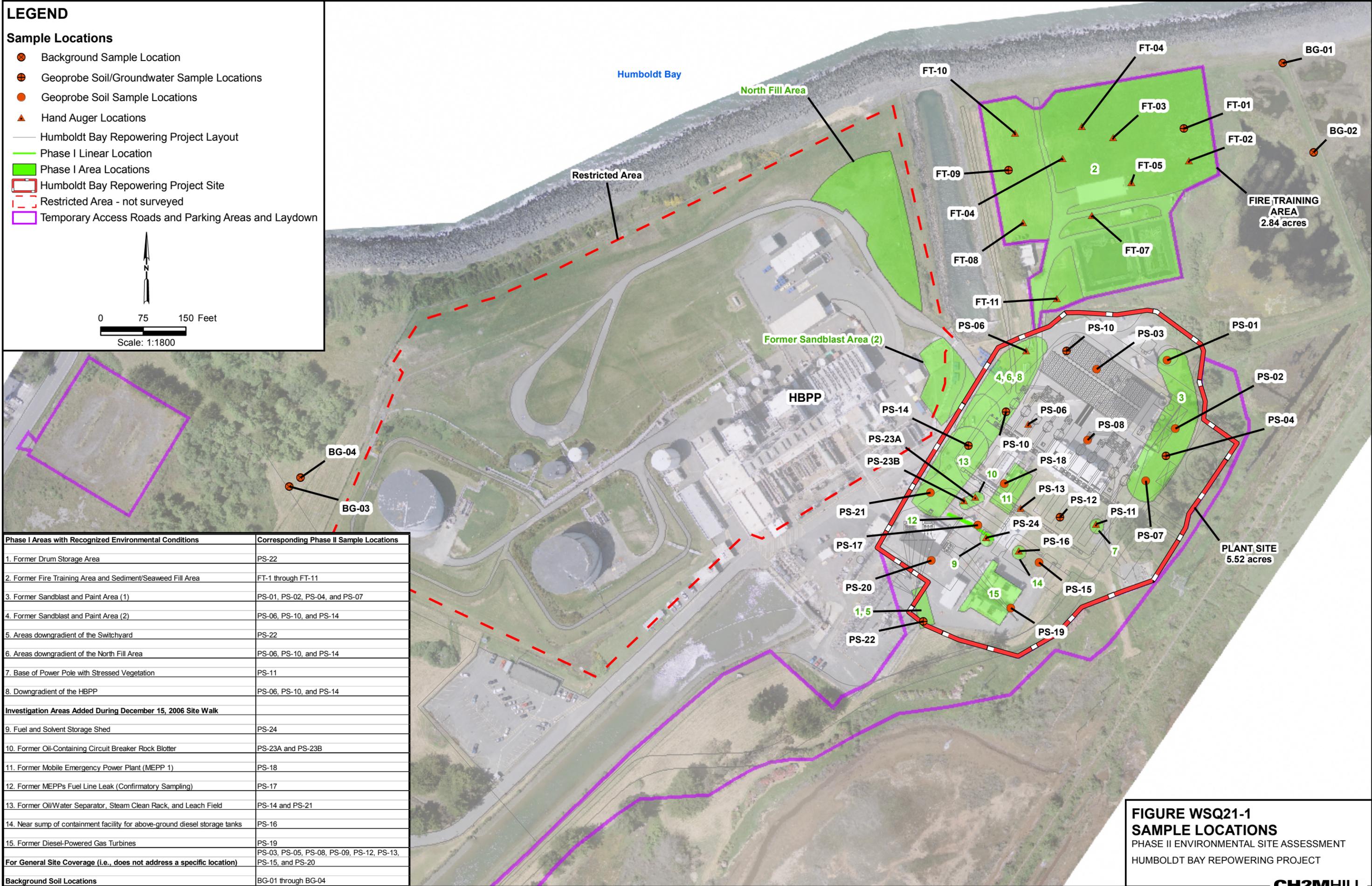
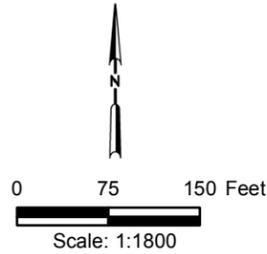
WSQ-21 *Please provide an updated map showing the eight areas of concern identified in the Phase I site assessment and the sampling locations for the Phase II site assessment.*

**Response:** Figure WSQ21-1 shows the Phase II Environmental Site Assessment sampling conditions, along with a table and labels indicating which samples were designed specifically to address areas of concern identified in the Phase I Environmental Site Assessment.

# LEGEND

## Sample Locations

- Background Sample Location
- ⊕ Geoprobe Soil/Groundwater Sample Locations
- Geoprobe Soil Sample Locations
- ▲ Hand Auger Locations
- Humboldt Bay Repowering Project Layout
- Phase I Linear Location
- Phase I Area Locations
- ▭ Humboldt Bay Repowering Project Site
- - - Restricted Area - not surveyed
- ▭ Temporary Access Roads and Parking Areas and Laydown



Phase I Areas with Recognized Environmental Conditions	Corresponding Phase II Sample Locations
1. Former Drum Storage Area	PS-22
2. Former Fire Training Area and Sediment/Seaweed Fill Area	FT-1 through FT-11
3. Former Sandblast and Paint Area (1)	PS-01, PS-02, PS-04, and PS-07
4. Former Sandblast and Paint Area (2)	PS-06, PS-10, and PS-14
5. Areas downgradient of the Switchyard	PS-22
6. Areas downgradient of the North Fill Area	PS-06, PS-10, and PS-14
7. Base of Power Pole with Stressed Vegetation	PS-11
8. Downgradient of the HBPP	PS-06, PS-10, and PS-14
<b>Investigation Areas Added During December 15, 2006 Site Walk</b>	
9. Fuel and Solvent Storage Shed	PS-24
10. Former Oil-Containing Circuit Breaker Rock Blotter	PS-23A and PS-23B
11. Former Mobile Emergency Power Plant (MEPP 1)	PS-18
12. Former MEPPs Fuel Line Leak (Confirmatory Sampling)	PS-17
13. Former Oil/Water Separator, Steam Clean Rack, and Leach Field	PS-14 and PS-21
14. Near sump of containment facility for above-ground diesel storage tanks	PS-16
15. Former Diesel-Powered Gas Turbines	PS-19
<b>For General Site Coverage (i.e., does not address a specific location)</b>	PS-03, PS-05, PS-08, PS-09, PS-12, PS-13, PS-15, and PS-20
<b>Background Soil Locations</b>	BG-01 through BG-04

**FIGURE WSQ21-1**  
**SAMPLE LOCATIONS**  
 PHASE II ENVIRONMENTAL SITE ASSESSMENT  
 HUMBOLDT BAY REPOWERING PROJECT

# **Worker Health & Safety**

WSQ Response 22

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# Worker Health & Safety (WSQ22)

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## Emergency services response

WSQ-22 *Please provide an update on discussions with the Humboldt Fire District, Eureka Fire Department, and the Eureka Hazardous Materials Response Team regarding potential impacts the HBRP may have on their capability to respond to a fire, hazardous materials spill, or emergency medical services issue at HBRP.*

**Response:** After meetings with the Humboldt Fire District (HFD) and the Eureka Fire Department (EFD), discussions have moved to the Eureka Fire Department Hazardous Materials Response Team. Both the HFD and the EFD agreed that any impacts of the HBRP would affect the EFD Hazardous Materials Response Team. PG&E is engaged in a very productive dialog with the EFD Hazardous Materials Response Team. During a meeting held with Assistant Chief Bennet on February 2, 2007, it was agreed that the Hazardous Materials Response Team's ammonia detectors are out of date and that PG&E will provide new detectors. EFD is researching available detectors and will provide a scope and cost as soon as possible.

In addition, PG&E will work with the EFD to prepare and submit a Federal Emergency Management Agency (FEMA) grant application for a new Hazardous Materials Response Vehicle. PG&E is evaluating a plan to provide matching funds to any FEMA contributions. A workshop addressing the new guidelines for FEMA grants will be conducted on February 15, 2007 in Eureka. PG&E is attending this workshop at the request of the EFD. PG&E will also work with EFD to support the FEMA request with letters of support from Sacramento and Washington.

# **Cumulative Impacts**

Data Responses 75-78

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# Cumulative Impacts (75-78)

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## Cumulative impacts and mitigation

75. *For the scenario entailing construction and commissioning of the proposed HBRP concurrent with continued operation of the existing HBPP, please address potential cumulative air quality impacts and mitigation measures.*

**Response:** Potential cumulative impacts of the operation of the existing Humboldt Bay Power Plant during construction and commissioning of the proposed HBRP were evaluated through dispersion modeling in Data Responses 12 through 15. These analyses showed that (1) there would be little or no overlap of impacts from the existing Humboldt Bay Power Plant and impacts from the HBRP construction project; and (2) impacts during operation of the existing plant in conjunction with commissioning activities at HBRP are expected to be lower on an annual basis because commissioning will be a short-term activity and emissions from the existing units may actually be reduced during the commissioning of the new HBRP units (see Data Responses 13 and 14). Therefore, no significant cumulative air quality impacts are expected and no additional mitigation will be required beyond the measures already proposed.

## ISFSI Project

76. *For the scenario entailing construction and/or spent fuel loading at the ISFSI Project site concurrent with the construction of the proposed HBRP, please provide a conceptual project description of the ISFSI Project and a brief discussion of potential cumulative impacts and mitigation measures. Please include discussion of the following general and focused technical areas as applicable without compromising ISFSI Project confidential information:*

### Response:

a) **General** – Describe the structure that would be installed, associated area in acres that would experience disturbance, and delineate the general location of activities and any associated staging areas on a site map;

The Independent Spent Fuel Storage Installation (ISFSI) project or Dry Cask Storage Project is a program that involves construction of an underground facility to provide long-term, safe storage of the spent fuel rods currently stored within Unit 3. Construction of the ISFSI will facilitate the decommissioning of Unit 3, which ceased operations in 1976. The purpose of the ISFSI is to provide a secure location for storage of the spent fuel assemblies to enable the structures comprising Unit 3 to be removed. On September 15, 2005, the California Coastal Commission voted to approve a Coastal Development Permit for the ISFSI project. The NRC issued a license for the ISFSI on November 17, 2005. Construction is scheduled to begin during March 2007. The facility construction and testing is expected to be completed by the end of 2007, with fuel loading scheduled to be completed during the first half of 2008.

In summary, the ISFSI involves the construction of a reinforced concrete vault suitable for long-term storage of the Humboldt Bay Power Plant Unit 3 spent fuel assemblies. The fuel

assemblies will remain in the ISFSI until a U.S. Department of Energy or other facility is available for further interim storage or permanent disposal.

The ISFSI design includes the following major structures, systems, and components: (1) the storage vault, (2) dry cask storage system, and (3) onsite transporter. The storage vault will be located within a protected area north of the Humboldt Bay Power Plant, but on the existing power plant property. The vault configuration dimensions are approximately 30 feet x 70 feet within a protected security area, or approximately 70 feet x 120 feet. A single-story security building will be constructed south of the ISFSI vault outside the restricted area fence for the ISFSI. This building will be approximately 20 feet x 40 feet. The storage vault is designed to accommodate six casks. Five casks will store spent fuel and the sixth will store other materials.

PG&E will use the Holtec International HI-STAR 100 dry cask system, as modified for the HBPP spent fuel. The HI-STAR HB is both a storage and transport cask that provides structural protection and radiation shielding for the multi-purpose canister (canister) containing the spent fuel. This device has an internal, cylindrical cavity of sufficient size to house a spent fuel canister during loading, unloading, and movement of the canister from the spent fuel pool to the storage vault and is constructed of carbon steel. Each loaded spent fuel cask is approximately 8 feet in diameter, 10.5 feet high, and weighs about 160,000 pounds

A transporter is used to move the cask from the refueling building to the vault. The transporter is a U-shaped tracked vehicle consisting of the vehicle main frame, hydraulic lifting towers, an overhead beam system that connects between the lifting towers, a cask restraint system, the drive and control systems, and a series of cask lifting attachments. The transporter is also used to lower the casks into the storage vault.

The NRC prepared an Environmental Assessment (EA) and Finding of No Significant Impact for the ISFSI under the National Environmental Policy Act (NEPA) in November 17, 2005 (Attachment DR76-1). The EA documented the NRC Staff's opinion that the construction, operation, and decommissioning of the ISFSI as planned would have no significant impact on the environment. The NRC Staff based their conclusions on a License Application, Environmental Report (ER), and Safety Analysis Report (SAR) prepared for the ISFSI project and submitted to the NRC on December 15, 2003 (NRC Docket 72-27). This document contains detailed information about the ISFSI design, detailed studies of the potential environmental effects of the ISFSI project, and a nuclear safety analysis of the project, and is available on request from PG&E.

*b) Air Quality – Potential impacts to air quality from simultaneous activity with the proposed HBRP, including any expected mitigation measures;*

Based on the current project schedules, ISFSI construction would be completed by the time HBRP construction begins. Therefore, the only portion of the ISFSI project that could overlap with HBRP construction is the transport of the casks to the storage vault. Potential air impacts from this portion of the ISFSI would be associated with emissions from the transporter. No detailed information regarding the design or operation of the transporter is available at this time, so it is not possible to prepare a detailed analysis of the combined air quality impacts of the cask transportation and loading with HBRP construction activities.

The ISFSI ER includes the following discussion of potential traffic-related impacts from the ISFSI:

...the primary sources of noise and traffic associated with ISFSI operation will occur during the brief period of initial delivery of the storage casks to the ISFSI and their placement in the ISFSI vault, the movement and placement of the fuel from the pool into the casks, and the eventual transportation of the casks offsite. These activities will involve minor noise generation from vehicles and cask movement machinery. However, these noise and traffic levels are similar to those that have existed at the site during operation of Unit 3, and which regularly occur on occasion with the other facilities at HBPP such as during outages. Further, any such increase in noise and traffic levels will occur only temporarily, on the order of days, and will not be continuous. Therefore, *any impact of noise and traffic from these short phases of ISFSI operation is expected to be small.* [Humboldt Bay ISFSI Environmental Report, Section 4.2.7: Effects of Facility Operation: Effects on Noise and Traffic; emphasis added]

Because the traffic levels associated with the cask transport will be small, any air quality impacts will likely be minimal.

If construction of the HBRP were to begin while the ISFSI was still under construction, then the two construction projects could occur simultaneously. The ER includes the following discussion of potential air quality-related impacts from construction of the ISFSI:

The generation of fugitive dust during construction will be minimal. Construction traffic will use existing paved roadways. The construction area surrounding the site is currently paved or graveled. The primary source of dust will be from wind transport of dust from excavation and fill operations. Dust control techniques may include watering and/or chemical stabilization of potential dust sources and will comply with state and local NCUAQMD regulations. Other techniques that may be used to control fugitive dust emissions include covering materials being hauled from the site by truck and by routine washing of trucks. Gaseous emissions from construction equipment will be mitigated typically by requiring regular maintenance of equipment.

In summary, *the impact of construction activities on air quality resulting from the Humboldt Bay ISFSI and associated facilities is considered to be small.* [Humboldt Bay ISFSI Environmental Report, Section 4.1.3: Effects of Site Preparation and Facility Construction: Effects on Air Quality; emphasis added]

It is expected that with the mitigation measures expected to be included in the Commission's Decision, air quality impacts from construction activities associated with HBRP will be mitigated to a level of less than significant, as is typical for CEC-approved projects. Therefore, it is unlikely that there will be any significant cumulative impacts during the brief period of concurrent operations, if they occur at all.

- c) **Biological Resources** – *Potential impacts, including additional disturbance to wetlands, and any expected mitigation measures;*

The ISFSI project would not have any significant biological resources impacts. The HBRP would have minor effects on wetlands as defined by the California Coastal Commission and on also on USACE Clean Water Act Section 404 jurisdictional wetlands, and these impacts will be fully mitigated. There would be no residual unmitigated impacts from these two projects that could combine to form a significant adverse impact.

- d) **Cultural Resources** – *Potential impacts, particularly to any buried archeological resources, and any expected mitigation measures;*

Cultural resources inventories for the ISFSI and the HBRP have been conducted and have concluded that there are no properties eligible for listing in the National Register of Historic Places or California Register of Historical Resources within the area of potential effects for either project that either project would affect. Humboldt Bay Power Plant Unit 3 has been determined by the NRC to meet the criteria for listing in the National Register of Historic Places. The NRC determined, and the California Office of Historic Preservation concurred, that the ISFSI would not have an adverse effect on this property. PG&E determined that the HBRP would not have an adverse effect on this property. The combined effect of the ISFSI and the HBRP would also not result in a cumulative adverse effect on this property.

Cumulative impacts could only occur if both projects were to encounter previously undiscovered (buried) archaeological deposits and inadvertently damage them. This would be unlikely to occur. Conditions of Certification for the HBRP will be likely to include measures requiring some level of construction monitoring for cultural resources. This will ensure that, if buried archaeological deposits are discovered during construction, inadvertent damage to these deposits would be kept to a minimum and, once they are discovered, impacts would be avoided or mitigated through a treatment plan.

- e) **Land Use** – *Explain the anticipated change in land use for the area where the ISFSI Project will be located.*

The area for which the ISFSI is planned is located on Buhne Point Hill, southwest of Units 1, 2, and 3. This area is currently unoccupied open space that is managed for vegetation control (mowed). The ISFSI will add an underground cask storage vault and security building to this area.

- f) **Soils** – *Potential impacts, including specifying the general type of ground covering existing currently and the type expected to be used after completion of the ISFSI, and if there would be a significant increase in impervious ground surfaces compared to existing conditions;*

The ISFSI would convert a portion of the area on Buhne Hill into the reinforced concrete dry cask storage vault. The increase to impervious soils resulting from the ISFSI would be minor. The ISFSI project site is 70 feet x 120 feet, or 8,400 square feet. All of the stormwater drainage from the ISFSI area would be intercepted by the existing Humboldt Bay Power Plant stormwater management system and would drain into the intake canal. The drainage basin in which the ISFSI is located is separate from that of the HBRP, so there would be no possibility of the runoff from these two areas combining and leading to a cumulative flooding effect.

- g) **Water Drainage and Flooding** – Clarify if there would be any significant changes in drainage patterns leading to a higher potential for flooding within power plant boundaries and adjacent lands;

See response to (f), above.

- h) **Waste Management** – Potential impacts, including any expected mitigation measures;

Phase II Environmental Site Assessment sampling has recently been completed for the HBRP and the results of laboratory analysis will determine whether or not remediation is necessary. Results of the Historical Site Assessment conducted to assess potential radiological contamination indicate that the ISFSI and the HBRP sites are both located in Class III areas that are unlikely to require remediation for radionuclides.

- i) **Schedule** – Confirm if the ISFSI Project is still scheduled for construction during March – November 2007 and for completion of the spent fuel loading by June 2008; If it has been updated, please provide the latest schedule.

The ISFSI is currently scheduled to be constructed between March and November 2007 and to complete fuel loading by June 2008. The actual fuel loading schedule is subject to change, as many components of the loading system are shared with DCPP. Should their loading plans result in conflict with the HBPP schedule, the loading could be delayed to late 2008 or 2009.

## Conceptual description after decommissioning of Units 1 and 2

77. For the scenario entailing the proposed decommissioning of Units 1 and 2 and the two Mobile Emergency Power Plants (MEPPs) that would occur following commercial operation of HBRP, please provide a conceptual project description and a brief discussion of potential impacts and mitigation measures including the following general and focused technical areas as applicable:

### Response:

- a) **General** – Describe the primary equipment and structures that would be removed, associated area in acres that would be disturbed, and delineate the general location of activities and any associated staging areas on a site map;

Demolition planning for Humboldt Bay Power Plant Units 1 and 2 has not been completed. The MEPPs are portable units that would not be demolished but would be removed from the site. The Unit 1 and 2 demolition projects will reuse the same laydown areas as the HBRP construction, but it is unclear at this time how much laydown space this project would require. Areas of disturbance would include the areas currently occupied by Units 1 and 2 and their support structures. The Humboldt Bay Power Plant Substation, however, would remain because it is necessary for the operation of the HBRP. There are no specific plans for demolition or reuse of other buildings and structures on the site that will not be demolished as part of the planned demolition of Units 1, 2, and 3; construction of the HBRP, or removal of the MEPPs.

Units 1 and 2 have been identified as Class II structures in the Historical Site Assessment. The demolition of these areas may, therefore, involve some remediation under the Multi-Agency Radiation Site and Survey Investigation Manual (MARSSIM) process. This will

occur under the jurisdiction of the NRC in conjunction with the other remediation activities on the Humboldt Bay Power Plant site, including those for Unit 3. Class II areas are areas that have a potential for radioactive contamination or known contamination, but are not expected to exceed the anticipated derived concentration guideline level (DCGL). The DCGL is the site-specific level designated for site release. Demolition planning for Units 1 and 2 cannot, therefore, begin until after the MARSSIM sampling study is completed. This study will provide more detailed information to characterize any contamination at Units 1 and 2 and will provide the basis for determining the DCGLs, which, in turn, will influence the final planning for demolition.

*b) Air Quality – Potential impacts to air quality, including any expected mitigation measures;*

Planning the demolition of Units 1 and 2 has not reached the point at which it is possible to project average and maximum construction workforce levels or to schedule the time frame for demolition. This is because, as described in subresponse (a) above, Units 1 and 2 are classified as Class II areas, and their demolition will take place under the NRC's jurisdiction and in accordance with the MARSSIM. Therefore, it is not possible to provide a detailed analysis of potential air quality impacts from the demolition of Units 1 and 2. However, in general, it is expected that air quality impacts during demolition of Units 1 and 2 would be similar to the air quality impacts from construction of the HBRP. A detailed analysis of cumulative impacts of construction of HBRP and operation of Humboldt Bay Power Plant (Data Response 12) showed that there was expected to be little or no overlap between the impacts of the two projects because of the nature of the activities. Based on the available information, it was concluded that there would be little or no overlap between the impacts of the demolition project and the operation of the HBRP.

The removal of the MEPPs would take place as soon as the HBRP begins commercial operation. Because the MEPPs are mobile units, they can be driven offsite once surrounding sound-reducing enclosures and other structures are removed. Air quality impacts related to removing the MEPPs are expected to be negligible because the activity will be short-term, equipment requirements will be minimal, and no significant dust-generating demolition activities are anticipated.

*c) Biological Resources – Potential impacts to biological resources, including additional disturbance to wetlands, and any expected mitigation measures;*

The demolition of Units 1 and 2 and the removal of the MEPPs would not have any impact on wetlands or other biological resources, as long as standard Best Management Practices are followed for the control of runoff and sedimentation, in accordance with the general construction National Pollution Discharge Elimination System Permit.

*d) Cultural Resources – Potential impacts to cultural resources, including impacts to a potential historically significant resource (Units 1 and 2), and any expected mitigation measures;*

Cultural resources studies for the HBRP determined that Humboldt Bay Power Plant Units 1 and 2 are not eligible for listing in the National Register of Historic Places, either as contributing elements of a historic district or as individual properties. Their demolition would therefore not require mitigation measures. There are no other cultural resources that HBRP construction or Unit 1 and 2 demolition would affect.

- e) **Land Use** – Explain the anticipated land use and restoration plans in a general manner for the area where equipment would be removed or land otherwise disturbed, such as if returning to vegetative cover, wetlands, or planning use for some other power plant purpose;

PG&E will remove existing structures, remediate any contamination as necessary, and then determine the future use of the areas where these structures are currently located. PG&E does not currently have specific plans for the property other than construction of the HBRP and ISFSI, and demolition of Units 1, 2, 3, and removal of the MEPPs. PG&E anticipates that the Humboldt Bay Power Plant property will remain an industrial site and may contemplate future uses, but there are no specific plans at this time.

- f) **Socioeconomics** – Please provide the best estimate of time frame and monthly workforce (average and peak if available) for the decommissioning of Units 1 and 2, and the MEPPs.

Planning the demolition of Units 1 and 2 has not reached the point at which it is possible to project average and maximum construction workforce levels or to schedule the time frame for demolition. This is because, as described in subresponse (a) above, Units 1 and 2 are classified as Class II areas, and, therefore, their demolition will take place under the NRC's jurisdiction and in accordance with the MARSSIM. The removal of the MEPPs would take place as soon as the HBRP begins commercial operation.

- g) **Soils** – Specify the general type of ground covering existing currently and the type expected to be used after decommissioning, and if there would be an increase in impervious ground surfaces compared to existing conditions;

It is expected that, with the demolition of Units 1 and 2, the amount of impervious ground surface on site would stay the same or decrease. The amount of runoff and risk of flooding would, therefore, remain the same or be reduced.

- h) **Water Drainage and Flooding** – Clarify if there would be any significant changes in drainage patterns leading to a higher potential for flooding within power plant boundaries and adjacent lands;

Decommissioning and demolition of Units 1 and 2 and removal of the MEPPs would not cause any significant change in the onsite drainage patterns or cause a higher potential for flooding. Impervious area would stay the same or be reduced.

- i) **Waste Management** – Potential impacts, including any expected mitigation measures, and salvage and disposal plans for removed equipment and demolished structures; and

Demolition of Units 1 and 2 is expected to generate concrete, metal, wood, and other material wastes. Some of this waste would likely be salvaged and recycled and some of it sent to a landfill. Quantities are unknown at this time. Because HBRP construction will be completed before the demolition of Units 1 and 2 takes place, cumulative adverse impacts to landfill capacity resulting from HBRP construction and Units 1 and 2 demolition are unlikely.

- j) **Schedule** – *Expected schedule for initiating and completing decommissioning (if not already answered under Socioeconomics above).*

See subresponse (f) above. The long-term decommissioning process for Units 1, 2, and 3 has, in a sense, begun with the completion of the Historical Site Assessment, which marks the first step in the overall MARSSIM process for decommissioning Unit 3.

### Conceptual description after decommissioning of Unit 3

78. *For the scenario entailing the proposed decommissioning of Unit 3 that would occur following commercial operation of HBRP, please provide a conceptual project description and a brief discussion of potential impacts and mitigation including the following general and focused technical areas as applicable:*

#### **Response:**

- a) **General** – *Describe the primary equipment and structures that would be removed, associated area in acres that would be disturbed, and delineate the general location of activities and any associated staging areas on a site map;*

Demolition planning for Humboldt Bay Power Plant Unit 3 has not been completed. The Unit 3 demolition project will reuse the same laydown areas as for HBRP construction, but it is unclear at this time how much laydown space this project would require. Areas of disturbance would include the areas currently occupied by Unit 3 and its ancillary structures. The Humboldt Bay Power Plant Substation, however, would remain because it is necessary for the operation of the HBRP. There are no specific plans for demolition or reuse of other buildings and structures on the site that will not be demolished as part of the planned demolition of Units 1, 2, and 3; construction of the HBRP; or removal of the MEPPs.

The buildings shown as Class I structures in Appendix B of the Historical Site Assessment, which was submitted to the CEC as Attachment DR57-1 in response to Data Request 57, would very likely be the buildings that would be demolished as part of the Unit 3 decommissioning and demolition project. Class I areas are areas that have a potential for radioactive contamination or known contamination, that are expected to exceed the anticipated DCGL. Demolition planning for Unit 3 cannot begin until after the MARSSIM sampling study is completed. This study will provide more detailed information to characterize any contamination at Unit 3 and will provide the basis for determining the DCGLs, which, in turn, will influence the final planning for demolition.

- b) **Air Quality** – *Potential impacts to air quality from simultaneous activity with the proposed HBRP, including any expected mitigation measures;*

Planning the demolition of Unit 3 has not reached the point at which it is possible to project average and maximum construction workforce levels or to schedule the time frame for demolition. However, in general it is expected that air quality impacts during demolition of Unit 3 would be similar in nature to the air quality impacts from construction of the HBRP. A detailed analysis of cumulative impacts of construction of HBRP and operation of HBPP (Data Response 12) showed that there was expected to be little or no overlap between the impacts of the two projects because of the nature of the activities. Based on the available information, it is concluded that there would be little or no overlap between the impacts of the demolition project and the operation of the HBRP.

- c) **Biological Resources** – *Potential impacts to biological resources, including additional disturbance to wetlands, and any expected mitigation measures;*

The demolition of Unit 3 is not expected to have any impact on wetlands. Unit 3 remediation may involve the removal of sediments in the intake canal near the intake pumps. This area may be considered habitat for the tidewater goby, a species listed as endangered under the Endangered Species Act. The NRC would, therefore, be required to consult with the U.S. Fish and Wildlife Service regarding the potential effects to this species and its habitat of the Unit 3 decommissioning and demolition project. The HBRP will have no effects on this species, either direct or indirect, so there would be no cumulative effects on this species from the two projects combined.

- d) **Cultural Resources** – *Potential impacts to cultural resources, including impacts to a potential historically significant resource (Unit 3), and any expected mitigation measures;*

Cultural resources studies for the ISFSI project determined that Humboldt Bay Power Plant Unit 3 is eligible for listing in the National Register of Historic Places under Criterion Consideration G, exceptional significance for properties less than 50 years old. The NRC, as lead federal agency, would therefore be required to consult with the Advisory Council on Historic Preservation and the California Office of Historic Preservation regarding ways to take into consideration the effects of the demolition program on this property. This consultation would take place under Section 106 of the National Historic Preservation Act and 36 CFR Part 800. A likely outcome of this consultation would be an agreement between the NRC, the Advisory Council, and the California Office of Historic Preservation to record and archive information about Unit 3 as a mitigation measure for the demolition of this property. This predicted outcome is speculative and it is not possible to know for certain what the outcome of the consultation will be. If recordation were the mitigation chosen, however, there could be residual impacts that are not possible or feasible to mitigate using this method. There are no impacts to cultural resources from the HBRP, however, that could combine with any such residual, unmitigated impacts from the demolition of Unit 3 to make a significant, adverse cumulative impact. PG&E has determined that Units 1 and 2 are not properties eligible for National Register nomination and that the HBRP would not have an adverse effect on Unit 3.

- e) **Land Use** – *Explain the anticipated land use and restoration plans in a general manner for the area where equipment would be removed or land otherwise disturbed, such as if returning to vegetative cover, wetlands, or planning use for some other power plant purpose;*

PG&E will remove existing structures, remediate any contamination as necessary, and then determine the future use of the areas where these structures are currently located. PG&E does not currently have specific plans for the property other than construction of the HBRP and ISFSI; demolition of Units 1, 2, and 3; and removal of the MEPPs. PG&E anticipates that the Humboldt Bay Power Plant property will remain an industrial site and may contemplate future reuses, but there are no specific plans at this time.

- f) **Socioeconomics** – *Please provide the best estimate of time frame and monthly workforce (average and peak if available) for the decommissioning of Unit 3.*

Planning the demolition of Unit 3 has not reached the point at which it is possible to project average and maximum construction workforce levels or to schedule the time frame for

demolition. This is because, as described in subresponse (a) above, Unit 3 is classified as Class I area and, therefore, demolition will take place under the NRC's jurisdiction and in accordance with the MARSSIM.

- g) **Soils** – *Specify the general type of ground covering existing currently and the type expected to be used after decommissioning, and if there would be an increase in impervious ground surfaces compared to existing conditions;*

It is expected that, with the demolition of Unit 3, the amount of impervious ground surface on site would stay the same or decrease. This would reduce the amount of runoff and reduce the risk of flooding.

- h) **Water Drainage and Flooding** – *Clarify if there would be any significant changes in drainage patterns leading to a higher potential for flooding within power plant boundaries and adjacent lands;*

It is expected that, with demolition of Unit 3, the amount of impervious ground surface on site would stay the same or decrease. Thus, the amount of runoff and risk of flooding would be reduced or stay the same.

- i) **Waste Management** – *Potential impacts, including any expected mitigation measures, and salvage and disposal plans for removed equipment and demolished structures; and*

Demolition of Unit 3 is expected to generate concrete, metal, wood, and other material wastes. Some of this waste would likely be salvaged and recycled and some of it sent to a landfill. Any material that meets the criteria for low-level radiological waste would be required to be deposited in a landfill qualified to handle such wastes. Quantities are unknown at this time. Because HBRP construction will be completed before the demolition of Unit 3 takes place, cumulative adverse impacts to landfill capacity resulting from HBRP construction and Unit 3 demolition are unlikely.

- j) **Schedule** – *Expected schedule for initiating and completing decommissioning (if not already answered under Socioeconomics above).*

See subresponse (f) above. The long-term decommissioning process for Units 1, 2, and 3 has, in a sense, begun with the completion of the Historical Site Assessment, which marks the first step in the overall MARSSIM process for decommissioning Unit 3.

**Attachment DR76-1**  
ISFSI Environmental Assessment and  
Finding of No Significant Impact  
November 17, 2005

---

November 17, 2005

Mr. David H. Oatley  
General Manager and Vice President  
Acting Chief Nuclear Officer  
Pacific Gas and Electric Company  
Diablo Canyon Power Plant  
P.O. Box 56  
Avila Beach, CA 93424

SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO  
SIGNIFICANT IMPACT RELATED TO THE CONSTRUCTION  
AND OPERATION OF THE HUMBOLDT BAY INDEPENDENT  
SPENT FUEL STORAGE INSTALLATION

Dear Mr. Oatley:

By letter dated December 15, 2003, as supplemented, Pacific Gas & Electric Company (PG&E) submitted an application to the U.S. Nuclear Regulatory Commission (NRC), requesting a site-specific license to build and operate an Independent Spent Fuel Storage Installation (ISFSI) at the Humboldt Bay Canyon Power Plant, in Humboldt County, California. As part of the application, PG&E submitted an Environmental Report, as required by 10 CFR 72.34.

The NRC staff reviewed PG&E's application in accordance with the requirements under 10 CFR Part 72 for ISFSIs and under the environmental protection requirements in 10 CFR Part 51. Based on its review, the NRC staff has concluded that the construction, operation, and decommissioning of the Humboldt Bay ISFSI would not result in a significant impact to the environment, and therefore, pursuant to 10 CFR 51.31, a Finding of No Significant Impact is appropriate. The results of the NRC staff's review are documented in the enclosed Environmental Assessment, and a Notice of Availability of Environmental Assessment and Finding of No Significant Impact has been forwarded to the Office of the Federal Register for publication.

Mr. Oatley

- 2 -

If you have any questions regarding this matter, please contact Mr. James Park of my staff. Mr. Park can be reached at (301) 415-5835 or by email at [jrp@nrc.gov](mailto:jrp@nrc.gov).

Sincerely,

**/RA/**

Scott C. Flanders, Deputy Director  
Environmental and Performance  
Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: As stated

cc (w/o enclosure): Mailing List

Docket No. 72-27

Mr. Oatley

- 2 -

If you have any questions regarding this matter, please contact Mr. James Park of my staff. Mr. Park can be reached at (301) 415-5835 or by email at jrp@nrc.gov.

Sincerely,

**/RA/**

Scott C. Flanders, Deputy Director  
Environmental and Performance  
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Enclosure: As stated

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Docket No. 72-27

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Pacific Gas and Electric Company  
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Docket Nos. 50-133, 72-27

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ENVIRONMENTAL ASSESSMENT  
RELATED TO THE CONSTRUCTION AND OPERATION OF THE HUMBOLDT BAY  
INDEPENDENT SPENT FUEL STORAGE INSTALLATION

DOCKET NO. 72-27  
PACIFIC GAS AND ELECTRIC COMPANY

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards  
Division of Waste Management and Environmental Protection

October 2005

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## ACRONYMS

ALARA:	As low as reasonably achievable
ANSI/ANS:	American National Standards Institute / American Nuclear Society
CCC:	California Coastal Commission
CEC:	California Energy Commission
CMP:	Coastal Management Plan
CFR:	Code of Federal Regulations
DOE:	U.S. Department of Energy
EA:	Environmental Assessment (prepared by the NRC)
ER:	Environmental Report (submitted by PG&E)
FONSI:	Finding of No Significant Impact
GTCC:	Greater than Class C waste
HI-STAR HB:	Holtec International's HI-STAR 100 dry cask storage system modified for the Humboldt Bay spent fuel
HBPP:	Humboldt Bay Power Plant
ISFSI:	Independent Spent Fuel Storage Installation
MLLW:	Mean lower low water
MPC:	multi-purpose canister
NCRWQCB:	North Coast [CA] Regional Water Quality Control Board
NCRP:	National Council on Radiation Protection and Measurements
NOAA Fisheries:	U.S. National Oceanographic & Atmospheric Administration National Marine Fisheries Service
NRC:	U.S. Nuclear Regulatory Commission
NRHP:	National Register of Historic Places
PG&E:	Pacific Gas & Electric Company
REMP:	Radiological and Environmental Monitoring Program
RFB:	refueling building
SAR:	Safety Analysis Report (submitted by PG&E)
SER:	Safety Evaluation Report (prepared by the NRC)
SHPO:	State Historic Preservation Officer
USFWS/AFWO:	U.S. Fish & Wildlife Service / Arcata [CA] Fish and Wildlife Office

## 1.0 INTRODUCTION

By letter dated December 15, 2003, Pacific Gas and Electric Company (PG&E) submitted an application to the U.S. Nuclear Regulatory Commission (NRC), requesting a site-specific license to build and operate an Independent Spent Fuel Storage Installation (ISFSI), to be located on the site of the Humboldt Bay Power Plant (HBPP), in Humboldt County, California. PG&E provided supplemental information by electronic mail on July 14, 2004 in response to two questions for clarification from the NRC staff.

A holder of an NRC license for a power reactor under 10 CFR Part 50 can construct and operate an ISFSI at that power reactor site under the general license provisions of 10 CFR Part 72, or may apply for a separate site-specific license. PG&E has applied for a site-specific license for the proposed Humboldt Bay ISFSI in accordance with the applicable regulations in 10 CFR Part 72.

### 1.1 Background

The HBPP consists of five electric generation units. Unit 3, a boiling water reactor, operated for approximately 13 years before being shutdown for a refueling in July 1976 (PG&E, 2003a). It has remained inactive since that time. PG&E received a construction permit for the HBPP on October 17, 1960. A provisional operating license, DPR-7, was issued in August 1962, with commercial operation of the Unit 3 reactor beginning in August 1963. On May 17, 1976, the NRC issued an order that required completion of seismic design upgrades and resolution of additional geologic and seismic concerns. In 1983, PG&E concluded that the necessary modifications were not economical and chose to decommission Unit 3. In 1988, the NRC approved the SAFSTOR<sup>1</sup> plan for Unit 3 and amended the plant's license under 10 CFR Part 50 to a "possession only" license that expires on November 9, 2015. PG&E currently stores spent fuel from previous HBPP operations in the Unit 3 spent fuel pool.

### 1.2 Need for the Proposed Action

Removal of the spent fuel from the HBPP Unit 3 spent fuel pool to the proposed ISFSI would permit the dismantling of the existing radioactive reactor structures, thereby providing for earlier decommissioning of the HBPP Unit 3 facility. This would allow earlier termination of the SAFSTOR license and restoration of most areas on site to unrestricted use.

Transfer of the fuel to dry storage in an ISFSI also would result in lowered operational costs for PG&E. In contrast with the currently-used wet storage method (*i.e.*, storage in the spent fuel pool), dry storage in an ISFSI is a passive storage process that does not require extensive operating equipment or personnel to maintain. The dry storage process would reduce both the amount of effluents generated by the existing SAFSTOR operation and the amount of solid radioactive wastes generated.

---

<sup>1</sup> SAFSTOR is a method of decommissioning in which the nuclear facility is placed and maintained in such condition that the nuclear facility can be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use (NRC, 2004).

### **1.3 Scope**

The NRC staff is reviewing PG&E's request in accordance with the requirements under 10 CFR Part 72 for ISFSIs and under the environmental protection regulations in 10 CFR Part 51. This document provides the results of the NRC staff's environmental review; the staff's radiation safety review is documented separately in a Safety Evaluation Report.

The NRC staff has prepared this Environmental Assessment (EA) in accordance with NRC requirements in 10 CFR 51.21 and 51.30, and with the associated guidance in NRC report NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs" (NRC, 2003). In 40 CFR 1508.9, the Council on Environmental Quality defines an EA as a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

This review will not address either the decommissioning of Unit 3 following transfer of the spent fuel to the ISFSI, or the transportation of the fuel offsite to a permanent federal repository.

### **1.4 Previous Environmental Assessments and Supporting Documents**

Among the documents evaluated in the preparation of this EA were:

- "Humboldt Bay Independent Spent Fuel Storage Installation Environmental Report" (PG&E, December 2003a), and amendments thereto;
- "Humboldt Bay Independent Spent Fuel Storage Installation Safety Analysis Report" (PG&E, December 2003b);
- NUREG-1166, "Final Environmental Statement for Decommissioning Humboldt Bay Power Plant, Unit 3" (USNRC, 1987); and
- "Holtec International HI-STORM 100 Cask System Amendment 1 Safety Evaluation Report" (USNRC, 2002b).

Additional references may be found in Section 10.0 of this EA.

## **2.0 THE PROPOSED ACTION**

The proposed action is for PG&E to construct, operate, and decommission an ISFSI at the HBPP site. The ISFSI would provide temporary dry storage capacity for the spent nuclear fuel that PG&E currently stores in the HBPP spent fuel pool, located in the shut-down Unit 3. The proposed ISFSI is intended as an interim facility consisting of an in-ground concrete structure with storage capacity for six shielded casks. Five casks would contain spent nuclear fuel and one would contain Greater-than-Class C (GTCC) waste. (GTCC waste is low-level radioactive waste generated by the commercial sector that exceeds NRC concentration limits for Class C low-level waste, as specified in 10 CFR 61.55). All such spent fuel and GTCC waste to be placed in the casks was generated from prior HBPP operations. The spent fuel would be stored in the ISFSI until the U.S. Department of Energy (DOE) takes possession and transports the spent fuel offsite to a federal repository, or until PG&E elects to transfer the spent fuel to another acceptable offsite interim storage facility, if one becomes available.

### **2.1 Location of the Proposed Action**

The Humboldt Bay ISFSI would be sited on the northern California coast in Humboldt County, approximately 4.8 kilometers (3 miles) southwest of the city of Eureka and approximately 402.3 km (250 mi) north of San Francisco. An area map is shown in Figure 1. PG&E owns 143 acres of land area along the mainland shore of Humboldt Bay and the intertidal areas extending approximately 150 meters (500 feet) into Humboldt Bay from this land area. The proposed ISFSI would be located within the HBPP site boundary on a small peninsula known as Buhne Point.

### **2.2 Description of Proposed ISFSI and Dry Cask Storage System**

As described in PG&E's application, the proposed ISFSI would consist of (1) the dry cask storage system, (2) an on-site cask transporter, and (3) an in-ground vault. For the storage system, PG&E has selected the HI-STAR 100 dry cask storage system manufactured by Holtec International with modifications for the Humboldt Bay spent fuel. The Humboldt Bay site-specific design is referred to as HI-STAR HB.

PG&E would use the HI-STAR HB Cask System to load, transfer, and store the HBPP spent fuel. The system consists of a multi-purpose canister (MPC) that contains the fuel and a HI-STAR HB overpack (cask) which contains the MPC during transfer and storage. These two components are described generally below; a more detailed description is contained in PG&E's application (PG&E, 2003a).

The MPC is a welded, cylindrical structure with flat ends and a honeycomb fuel basket. The structural function of the MPC in the storage mode is to (1) position the spent fuel in a sub-critical configuration, and (2) provide a confinement boundary.

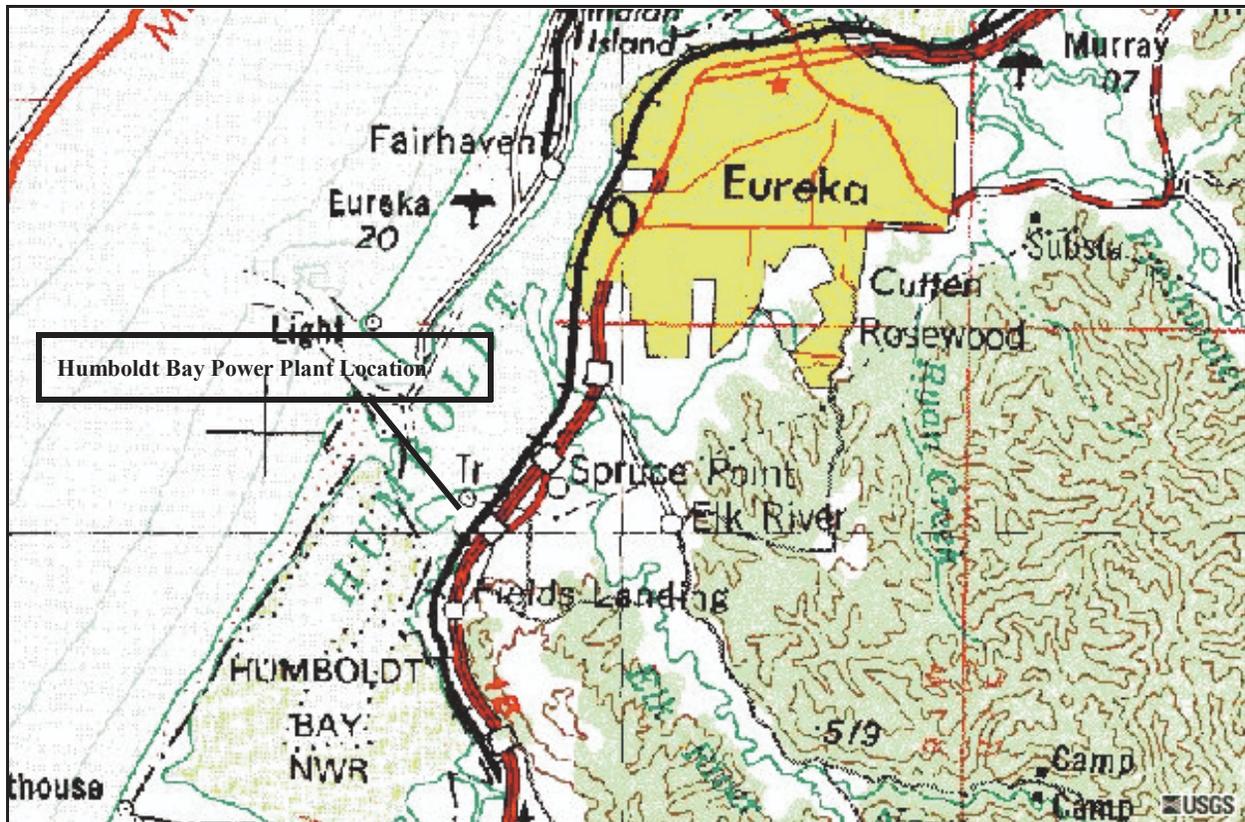


Figure 1. Humboldt Bay Power Plant and Its Environs (USGS, 2005 figure as modified)

The closure system for the MPC consists of two components; the MPC lid and closure ring. The MPC lid is a thick, circular ring plate that is welded to the MPC shell and lid. The MPC lid is equipped with vent and drain ports, which are used for evacuating moisture and air from the MPC following fuel loading and the subsequent backfilling with helium. The vent and drain ports are covered by a cover plate and welded shut before the closure ring is installed. The seal-welded closure ring provides redundant closure of the MPC lid and cover plate confinement closure welds.

The HI-STAR HB overpack is a heavy, cylindrical, multilayered steel vessel. It serves as a missile barrier and radiation shield, in the storage mode. The multilayered approach eliminates the potential for a crack in any one layer to travel uninterrupted through the vessel wall, thus lessening concerns over brittle fracture at low temperature. The overpack also is equipped with lifting trunnions to facilitate handling of a loaded cask.

The HI-STAR HB system is designed to accommodate intact fuel assemblies, damaged fuel assemblies, and fuel debris. The damaged fuel assemblies and fuel debris must be placed in a damaged fuel container, which is designed to confine gross fuel particulates to a known, sub-critical geometry. The physical characteristics of the spent fuel assemblies to be stored are described in greater detail in Section 3.1 of the Humboldt Bay ISFSI Safety Analysis Report (SAR) (PG&E, 2003b).

The movement of the HI-STAR cask system from the Unit 3 refueling building (RFB) to the ISFSI will be accomplished using a tracked transporter. PG&E proposes to use the transporter developed for the Diablo Canyon Power Plant ISFSI. The HI-STAR HB may also be licensed under 10 CFR Part 71 for offsite transport of the spent fuel; however, that is outside the scope of the proposed action.

The storage vault would be comprised of six below-grade, vertically oriented, cylindrical storage cells that are structural units constructed of steel-reinforced concrete with a carbon steel liner. Each storage cell would be approximately 2.7 m (9 ft) in diameter by 3.5 m (11-1/2 ft) deep. The bottom of the vault would be constructed of 0.9 m (3 ft) thick reinforced concrete, with the end walls of approximately 2.1 m (7 ft) thick and the longitudinal (side) walls of 1.7 m (5-1/2 ft) thick concrete. The concrete wall thickness would vary around the circumference of the storage cells and have a minimum thickness of approximately 0.2 m (9 inches) to 0.3 m (1 ft) of concrete between adjacent cells. Each of the storage cells would accommodate one cask (either a loaded HI-STAR HB overpack or the GTCC cask). The elevation of the vault top (without the storage cell lids installed) would be approximately flush with grade, with the lids approximately 0.4 m (16-1/4 inches) high, not including the height of the lid bolt caps.

### **2.3 Planned Activities**

PG&E has identified three phases to the HBPP ISFSI project: construction, operation, and decommissioning.

#### **2.3.1 Construction**

The major construction elements of the Humboldt Bay ISFSI would be (1) the ISFSI vault structure, (2) an associated security building, (3) the transport route modification from the RFB, and (4) installations and minor modifications inside the RFB. Construction is expected to take approximately 6 months, with activity occurring generally during daylight hours. Activities would be confined to the area within the HBPP site boundaries, with the construction limited to the vicinity of the ISFSI site and the nearby, onsite excavation spoils disposal area.

Construction of the ISFSI storage vault would require the removal of vegetation, soil excavation, spoils disposal, forming and pouring the concrete vault structure, and excavation backfill. PG&E estimates that approximately 917 cubic meters (1200 cubic yards) of material would be excavated using standard earthmoving equipment and disposed onsite at the spoils disposal site. Another approximately 765 m<sup>3</sup> (1000 yd<sup>3</sup>) would be moved around during construction and used at the ISFSI for final site contouring. Concrete for the ISFSI vault would be obtained from offsite sources. The in-ground vault, with dimensions of approximately 6.1 m x 23.2 m (20 ft x 76 ft), is designed to accommodate the six storage casks.

A single-story security building would be constructed for the ISFSI. The security building would be approximately 6.1 m x 12.2 m (20 ft x 40 ft) and no more than 6.1 m (20 ft) in height. It would be located outside the security fencing for the ISFSI, to the east of the vault, and there would be water, sewer, electrical, and telephone connections to the security building. Construction of the security building would involve minor excavation in order to install the footing and foundation for the building, with concrete for this operation delivered from offsite. Lumber, glass, and insulation also may be brought to the ISFSI security building construction

site. Other auxiliary security components of the ISFSI include the installation of chain-link fencing, perimeter lighting, and security surveillance monitoring equipment.

A road approximately 7.9 m (26 ft) wide and surfaced appropriately for the loading would provide the transport route from the RFB to the ISFSI site. The existing oil supply road would be widened from 5.5 m to 7.9 m (18 ft to 26 ft) for this purpose and extended approximately 61 m (200 ft) to the proposed ISFSI site.

Additionally, inside the RFB, PG&E would install a cask handling crane and a rail dolly for transporting the casks into and out of the building.

### 2.3.2 Operation

The second phase of the project, operation of the ISFSI, involves pre-operational testing, transfer of the spent fuel from the spent fuel pool to the ISFSI, closure of the vault, and operational monitoring.

Before any fuel would be moved from the spent fuel pool for placement in the ISFSI, PG&E would perform pre-operational and start-up testing of the relevant equipment. These pre-operational tests would be performed on the davit crane, the transporter, and all ancillary storage system components, such as the automated welding and drying systems. The startup testing plan would be used to verify the performance of the storage system and to ensure that plant equipment meets the functional requirements identified in the ISFSI Safety Analysis Report. Mock-ups and actual plant equipment would be used during start-up activities.

The spent fuel storage process would begin in the HBPP Unit 3 RFB, where a HI-STAR HB cask, with an empty MPC inside, would be lowered into the spent fuel pool. Spent fuel assemblies then would be loaded into the MPC and verification of the assembly identification provided. While still underwater, a thick MPC lid would be installed for shielding. When the HI-STAR HB cask is removed from the spent fuel pool, the lift yoke, cask, and top of the MPC would be rinsed down. Once removed from the spent fuel pool, the top surfaces of the MPC lid and the upper flange of the cask then would be decontaminated. Dose rates would be measured at the cask to ensure that they fall within expected values. The MPC lid would then be seal-welded and all liquid water removed from the MPC.

Following successful completion of a dryness test, the MPC would be backfilled to a pre-determined pressure of helium gas. The backfill ensures adequate heat transfer during storage, and provides an inert atmosphere for long-term fuel integrity. Cover plates then would be installed and seal-welded over the MPC vent and drain ports. To provide redundant closure of the MPC lid and cover plate confinement closure welds, the MPC closure ring is placed on the MPC and seal-welded. The MPC lid and accessible areas of the top of the MPC shell would be smeared, tested, and checked for removable contamination and the HI-STAR cask dose rates measured. The overpack top next would be installed and the lid studs and nuts torqued.

After the overpack top lid is installed, the loaded HI-STAR HB system would be rigged to the onsite transporter and transferred to the ISFSI vault. Once in the vault, no active components would be needed to ensure safe storage of the spent fuel.

### 2.3.3 Decommissioning

Prior to the end of the Humboldt Bay ISFSI's operational life, the HI-STAR HB casks containing the spent fuel elements and GTCC waste would be removed from the vault and transported offsite. The system is designed to allow the spent fuel to remain sealed inside the MPCs such that decontamination of the casks is not required.

Following shipment of the casks offsite, the Humboldt Bay ISFSI would be decommissioned through the following steps:

- the timely identification and removal of any residual radioactive materials above the applicable NRC limits for unrestricted use;
- performance of a final radiological survey;
- release of the site for unrestricted use in accordance with 10 CFR Part 20, Subpart E, "Radiological Criteria for License Termination," and
- termination of the NRC SAFSTOR license.

Preliminary details on PG&E's plans for decommissioning are provided in its Humboldt Bay ISFSI application, Attachment F, "Preliminary Decommissioning Plan" (PG&E, 2003a).

## 2.4 Duration of the Proposed Action

Upon NRC approval, the HBPP ISFSI would be licensed for a period of 20 years, the maximum term for an initial ISFSI license, as specified in 10 CFR 72.42. At the end of the 20-year license period, a licensee may request renewal of its ISFSI license, subject to further NRC safety and environmental review and approval.

Pursuant to 10 CFR 72.54(d), PG&E would need to notify the NRC of its intent to decommission the ISFSI and provide to the NRC its final decommissioning plans for approval. Following NRC approval, PG&E could begin decommissioning the ISFSI. Aspects of the HBPP site other than the proposed ISFSI could be decommissioned prior to and separately from the ISFSI.

## 3.0 ALTERNATIVES TO THE PROPOSED ACTION

### 3.1 No Action Alternative

Under the "no action" alternative, PG&E would continue to store the spent fuel from prior operations at the HBPP in the spent fuel pool in Unit 3. PG&E would continue to conduct approved and appropriate maintenance and monitoring. Unit 3 would remain under the SAFSTOR license.

Under this alternative, PG&E would not be permitted to completely dismantle the existing HBPP Unit 3 radioactive reactor structures, and therefore would not be able to decommission the Unit 3 facility to allow unrestricted use, and thus could not terminate the SAFSTOR license. PG&E would continue to incur the costs associated with maintaining and monitoring the spent fuel pool, the management of solid radioactive wastes, and the monitoring of effluents generated by the existing SAFSTOR operation.

### **3.2 Building a New Storage Pool**

Alternately, PG&E could construct a new storage pool and support facilities separate from the existing HBPP Unit 3. This would allow PG&E to decommission the Unit 3 facility. However, in addition to requiring the same support facilities, maintenance and surveillance as for the current spent fuel pool, a new storage pool would require new fuel handling equipment, a large capacity cask crane, building ventilation, and a water quality system. The fuel would be moved from the current fuel pool to the new pool and would require some type of dry cask transfer system to safely move the fuel.

This alternative increases the number of times a fuel assembly is handled and, consequently, the potential occupational exposure to the workers. The additional maintenance and surveillance activities to support operation of the new pool would also result in higher worker exposures. This alternative also has a high cost, due to construction of the new pool and facilities, and for the dry transfer system needed to transfer the fuel. For these reasons, building a new fuel pool is not considered a viable alternative and is eliminated from further detailed study.

### **3.3 Shipment Offsite**

PG&E could ship the spent fuel offsite. This would permit PG&E to proceed subsequently with dismantling and decommissioning of the Unit 3 facility. Termination of the HBPP SAFSTOR license could then follow. In addition, there would be no environmental impacts associated with construction, operation, and decommissioning of an ISFSI. However, radiological and non-radiological impacts resulting from the packaging and transfer of the spent fuel for shipment and from the transportation of the fuel to the alternate site would need to be assessed.

The alternatives of shipping spent fuel from HBPP to a permanent federal repository, to a reprocessing facility, or to a privately-owned spent fuel storage facility are not reasonable given that no such facilities are currently available in the United States. Although reprocessing facilities exist in other countries, the political, legal, and logistical uncertainties and the high cost of shipping spent fuel overseas also make this alternative not viable.

PG&E could ship the HBPP spent nuclear fuel to another nuclear power plant with sufficient storage capacity. The receiving utility would need to be licensed to accept the HBPP spent nuclear fuel and would have to be willing to accept the fuel. Because most nuclear power plant operators are expected to face their own limitations on spent fuel storage capacity, PG&E felt it unlikely that other operators would be willing to accept spent fuel owned by another company. Shipment to a PG&E-owned facility (e.g., the Diablo Canyon Power Plant) would be subject to similar considerations.

### **3.4 Siting Alternatives**

PG&E evaluated several sites within its HBPP-controlled area as potential locations to construct the ISFSI. This evaluation is discussed in Chapter 8 of the ER (PG&E, 2003a). Evaluation criteria addressed (1) design parameters for the vault and associated separation and security needs; (2) site-specific geological and geotechnical issues (e.g., bearing capacity of the foundation, flood hazards, landslide potential); (3) specifications for the transfer route from the

RFB; (4) impacts to existing facilities; (5) minimization of environmental impacts; (6) as low as reasonably achievable (ALARA) issues, (7) operational efficiency, and (8) cost considerations. The NRC staff reviewed PG&E's siting selection process and finds it acceptable.

PG&E selected five candidate sites for additional study using the criteria defined above. The site chosen by PG&E is located northwest of the plant in an area that was previously disturbed during the original HBPP construction and by on-going HBPP operational activities. Its elevation would minimize effects from tsunamis, the proposed in-ground vault would be above the water table at that location, and the distance from all known faults would be maximized. In addition, the existing fossil fuel operating units would be located outside the 100-meter (328-foot) isolation zone required under 10 CFR §72.106. Finally, PG&E identified no other adverse geologic or geotechnical conditions that would preclude development of the facility at the preferred site, and the site also was judged acceptable under the other siting selection criteria. The other four candidate sites were deemed less acceptable due to tsunami and water table concerns.

The NRC staff did not evaluate potential ISFSI sites on the HBPP permit area other than PG&E's proposed site, which was selected using PG&E's siting selection process.

### **3.5 Dry Storage System and Vault Design Alternatives**

PG&E evaluated proposals from different vendors for dry storage systems for use in the Humboldt Bay ISFSI. Each of the systems included (1) a canister-based, dual-purpose system suitable for both storage and eventual offsite shipment, and (2) horizontal and vertical concrete vault systems suitable only for storage.

Based on its evaluation, PG&E selected a modified version of the HI-STAR system designed by Holtec International. One unique feature of the HI-STAR system to be used at Humboldt Bay is that it will be installed in an in-ground storage structure. The system will be designed to allow the spent fuel to be shipped offsite without having to transfer the fuel to a different shipping overpack (cask).

PG&E also evaluated alternative storage structures consisting of either (1) a surface pad design or (2) an in-ground vault design. PG&E selected the vault design, because it would provide a more robust structure to resist potential seismic and tsunami loadings and site industrial hazards, and it would provide maximum shielding so as to minimize radiation exposures to the public and plant workers.

## **4.0 AFFECTED ENVIRONMENT**

### **4.1 Proposed ISFSI Site Description**

The ISFSI would be located within the HBPP site boundary near the power plant buildings on a small peninsula known as Buhne Point, nominally at 13.4 m (44 ft) above mean lower low water (MLLW). The site is above the surrounding flood plain and wetland areas of Humboldt Bay and lies between the North Coast Railroad (formerly the Northwestern Pacific Railroad) tracks and the north shoreline of Buhne Point. The ISFSI would be located near the top of a small hill with wetlands to the east and Humboldt Bay to the west.

The terrain in the vicinity of the HBPP rises rapidly from the bay on the north side to an elevation of approximately 21 m (69 ft) MLLW at the Buhne Point peninsula. Terrain to the north and east of the site is generally flat. To the south and east, the land rises rapidly within 3.2 km (2 mi) of the proposed ISFSI to Humboldt Hill, at an elevation of over 150 m (500 ft) MLLW and the site of several small neighborhoods. As a whole, Humboldt County is mostly mountainous except for the level plain that surrounds Humboldt Bay.

## **4.2 Land Use**

The proposed Humboldt Bay ISFSI site is located on the northern California coast in Humboldt County, approximately 4.8 km (3 mi) southwest of the city of Eureka. PG&E owns 143 acres of land area along the mainland shore of Humboldt Bay and the intertidal areas extending approximately 150 m (500 ft) into Humboldt Bay from this land area.

At the HBPP, PG&E has full authority to control all activities within its property lines. As stated previously, the HBPP consists of four electric generation units that are currently operating and Unit 3, which is not in use. Units 1 and 2 are co-located conventional 53 megawatt-electric (MWe) units capable of operating on fuel oil or natural gas. Unit 3 is located in a separate building, adjacent to Unit 2. Two gas turbines, rated at 15 MWe each, are located in the vicinity of the Units 1, 2, and 3 structures. The four generating units and Unit 3, as well as the plant site, are owned by PG&E.

Humboldt Bay and the surrounding lowlands comprise the region south, east, and west of the site. The lowland areas around the site are primarily vacant land and are used to a limited extent for grazing beef cattle. Humboldt Hill is the dominant feature southeast of the site. Most of the mountainous area east and southeast of the site is inaccessible.

The City of Eureka, with a population of approximately 26,000, is the largest population center in Humboldt County. Within 8 km (5 mi) of the ISFSI site, there are several small residential communities including: King Salmon, Humboldt Hill, Fields Landing, and the suburban communities surrounding Eureka. King Salmon is located to the west of the ISFSI site, adjacent to the site location, while Fields Landing is located approximately 0.4 mile south. No major new developments are currently planned for the area within 8 km (5 mi) of the ISFSI site.

A total of nine farms and ranches and one community vegetable garden have been identified within 8.0 km (5 mi) of the proposed ISFSI site. The primary local farming products are dairy products, cattle, goats, and llamas. Most of the dairies are located along the Elk River to the north of the proposed ISFSI, while the coastal lowlands are used primarily for cattle grazing and ranching. The nearest dairy, which produces approximately 3028 liters (800 gallons) of milk per day, is located 2.9 km (1.8 mi) east of the site. The nearest vegetable garden is the Wiyot Tribe community vegetable garden located approximately 6.8 km (4.2 mi) southwest of the site.

The primary industry in the area, and in Humboldt County, is lumber and lumber/paper manufacturing. Lumber production in Humboldt County in 2000 was valued at \$285.5 million. A lumber-loading shipyard is located on Humboldt Bay less than 1.6 km (1 mi) south of the ISFSI site.

The ISFSI site is located in the vicinity of several ports that support commercial and sport fishing activities, and a public trail to access a breakwater for recreational fishing crosses the proposed controlled area for the ISFSI. Among the fish harvested are sole, rockfish, salmon, and tuna, along with crabs and shrimp and prawns.

Visitors are attracted to the area by the numerous state and county parks both along the coast and in the inland forests. In addition to the small beach on the western side of the peninsula, there are public beaches located along Humboldt Bay and the Pacific Ocean coast that are popular with local residents as well as tourists. Much of the coastal area on the inside of the bay falls within the boundaries of the Humboldt Bay National Wildlife Refuge, which is within 8 km (5 mi) of the proposed ISFSI site.

### **4.3 Demography**

The population distribution and projections for areas around the proposed ISFSI site are based on the Year 2000 census and on estimates prepared by the California Department of Finance (California Department of Finance, 2004). The area within 80.5 km (50 mi) of the ISFSI includes most of Humboldt County and a small portion of Trinity County. Approximately 50 percent of the area within the radius is on land, with the balance being Humboldt Bay and the Pacific Ocean. In general, the portion of California that lies within 80.5 km (50 mi) of the ISFSI is relatively sparsely populated, with the exception of a few urbanized areas along the coast.

According to the 2000 Census (U.S. Census Bureau, 2004), the population of Humboldt County was 126,518 and the population of Trinity County was 13,022. Humboldt County has seven incorporated cities ranging in size from approximately 300 to 26,000 persons. Approximately 67,000 of county residents reside in unincorporated communities. The nearest population center to the proposed ISFSI site, the City of Eureka, had a population of 26,128 in 2000.

There are numerous schools located within 16.1 km (10 mi) of the proposed ISFSI site, particularly in the population centers. Several K-12 schools are located within 8 km (5 mi) of the site, serving the City of Eureka and neighboring communities. Humboldt State University, with an enrollment of approximately 7,500 students, is located in the City of Arcata approximately 24.1 km (15 mi) northeast of the ISFSI site. The College of the Redwoods is located within 8 km (5 mi) of the site just south of the City of Eureka and has an enrollment of approximately 5,000 full and part-time students.

In addition to the resident population, there is a seasonal influx of vacation and weekend visitors within a 80.5-km (50-mi) radius, especially during the summer months. The influx is heaviest in the area around Humboldt Redwoods State Park (located about 72.4 km (45 mi) south-southeast of Eureka) and along the Pacific Ocean coast north of the site in the area around the City of Trinidad. An estimated 2.1 to 2.2 million people visit the county per year (PG&E, 2003a).

#### 4.4 Climatology and Meteorology

The climate of the greater Humboldt Bay region, including Eureka and the immediate coastal strip where the project site is located, is characterized as Mediterranean. The average annual temperature is 10.5EC (51EF), with the warmest months from July to September and the coldest months from December to February. The rainy season generally falls between November and March, with an average annual rainfall of 98.73 centimeters (38.87 inches) over the 110-year measured record at Eureka, and a maximum recorded annual rainfall of 170.76 cm (67.23 in). The wind is predominantly from the north to northwest, with a shift to the south to southeast during the winter months.

#### 4.5 Hydrology

The proposed ISFSI site is located on a relatively flat area on Buhne Point at elevation 13.4 m (44 ft) MLLW. Surface drainage around the ISFSI area flows naturally into the existing plant drainage system. By way of the plant drain system, the surface water then discharges into the cooling water intake canal, flows through the plant, and discharges into Humboldt Bay via the cooling water discharge canal. Outside the area served by the plant drainage system, most of the surface runoff drains to the east and into the discharge canal. The remainder drains into Buhne Slough, a natural drainage for the area, which drains directly into both the intake canal and Humboldt Bay.

##### 4.5.1 Surface Water

Several rivers and creeks drain the region around the HBPP and the proposed ISFSI site, including the Mad River, which flows west approximately 24.1 km (15 mi) northeast of the site, and the Eel River, which discharges into the Pacific Ocean approximately 12.9 km (8 mi) south of the site. Of the four major creeks that drain into Humboldt Bay, Salmon Creek and Elk River are the ones nearest to the site; both within 1.6 km (1 mi) south and north, respectively, of the ISFSI site. Salmon Creek and Elk River are used for watering livestock, but are not used as a potable water supply.

With respect to the proposed ISFSI site, the watersheds of Humboldt Bay and the bay itself are the most relevant surface water bodies. Humboldt Bay is a large, shallow body of water with deep channels, separated from the ocean by two long, narrow spits. It is a tidal bay, receiving and discharging ocean water through the inlet between the spits. The bay is approximately 22.5 km (14 mi) long, its width ranging from 0.8 km (0.5 mi) near its middle to over 3.2 km (2 mi) at the south end and 6.4 km (4 mi) at the north end, with an average depth of 3.7 m (12 ft) MLLW. Very little fresh water discharges into Humboldt Bay.

Wetlands also are present in the vicinity of the proposed ISFSI, to the east and south. Those closest to the site are classified as “freshwater emergent” or “estuarine and marine wetland” under the National Wetlands Inventory classification (U.S. Fish and Wildlife Service, 2004).

##### 4.5.2 Groundwater

PG&E investigated groundwater in the ISFSI site area over a several-year period during the mid- to late-1980s. Two areas were investigated in detail, one near Unit 3 and one near the former wastewater pond site that is east of Unit 3. Based on information taken from borings

and analysis of the stratigraphy and aquifer characteristics, several aquifers and zones of perched groundwater in the ISFSI Site Area are evident. Groundwater level and flow direction at the Humboldt Bay ISFSI is influenced by several factors, including topography, proximity to Humboldt Bay, stratigraphy, and tectonic tilting and faulting of the Hookton Formation.

Beneath the ISFSI site, the first aquifer encountered is the upper Hookton aquifer. The top of this aquifer is located at approximately 1.8 m (6 ft) above MLLW or approximately 6.7 m (22 ft) below the base of the proposed ISFSI. Localized perched water zones are also found beneath the HBPP site (PG&E, 2003a).

#### **4.6 Geology and Seismology**

HBPP and the proposed ISFSI site are on the east flank of Buhne Point, a small headland on the eastern shore of Humboldt Bay. The site is underlain by a thick sequence of late Tertiary and Quaternary sedimentary rocks, and is capped by a late Pleistocene terrace. The main geologic formation in the area is the Pleistocene Hookton Formation that is about 335 m (1100 ft) thick beneath the ISFSI site area. Its sediments hold several of the important groundwater aquifers in the area and the region. Buhne Point is situated within the Little Salmon fault zone, and has been uplifted and tilted gently to the northeast by displacement on the fault. Mapping, borehole, trenching, and dating studies at and near the HBPP site were used to document the stratigraphy of the site (PG&E, 2003a).

Four traces of the Little Salmon fault zone are mapped in the vicinity of the ISFSI site. These include two primary fault traces: the Little Salmon and Bay Entrance faults, and two subsidiary faults: the Buhne Point and Discharge Canal faults, located in the hanging wall of the Bay Entrance fault. The Little Salmon, Bay Entrance, and Buhne Point faults all dip to the northeast and displace the Hookton Formation down to the southwest. The Discharge Canal fault dips steeply to the southwest and has down-to-the-northeast displacement. Faults in the Little Salmon fault zone are close to the site and have the potential to generate large-magnitude earthquakes (PG&E, 2003a). However, the style and structure of deformation associated with future activity along the Little Salmon fault zone is not expected to cause surface rupture, and the site is not susceptible to deep landslides from such activity (PG&E, 2003a).

Tsunami hazards along the coast of northern California have been recognized for many decades. The tsunami associated with the 1964 "Good Friday" Alaska earthquake was very destructive in Crescent City (approximately 136.8 km (85 mi) to the north) and caused minor runups within Humboldt Bay. As stated previously in section 4.1, the proposed ISFSI would be located at 13.4 m (44 ft) above mean lower low water, which would be 2.4 m (8 ft) higher than the conservative estimates of tsunami runup calculated by PG&E (PG&E, 2003a). Even if the proposed ISFSI were inundated by a tsunami, the casks would be protected from tsunami-generated flowing water and water-borne debris within the vault. The HI-STAR HB casks can be temporarily wetted with seawater without harm to the casks (PG&E, 2003a).

With respect to potential seismic and tsunami hazards, a more detailed review of PG&E's evaluation of these hazards is presented in the NRC staff's Safety Evaluation Report.

## 4.7 Ecology

The vicinity within 8.0 km (5 mi) of the proposed ISFSI site provides a wide array of habitats for plants and animals. Terrestrial ecological surveys identified more than 200 vascular plants and 12 vegetation communities in the area in and around the ISFSI site. Additionally, an extensive list of birds, mammals, reptiles, and amphibians is provided in the Tables 2.3-3 through 2.3-5 of the Humboldt Bay ISFSI Environmental Report (PG&E, 2003a).

PG&E-owned land near the ISFSI site was inventoried for the presence of special status plant species in 1999 and 2002. Site vegetation habitats, present in the project area (storage site, fill disposal area, and transportation route) consist primarily of disturbed coastal terrace prairie. The site has been disturbed considerably over the life of the HBPP facility, from initial construction to the ongoing maintenance activities (e.g., mowing). Most of the species occurring on the site and related project areas are nonnative species, many of which are ruderals (*i.e.*, plants that grow in wastelands or disturbed areas). Areas previously cleared of vegetation, such as along the discharge canal, access roads, and parking lots, are dominated by the ruderal species present in the disturbed grassland. A comprehensive field study in 2002 on the HBPP site did not locate suitable habitat for or any presence of plant species designated for special status by the State of California or federally listed or candidate threatened or endangered plant species (PG&E, 2003a). The western lily (*Lilium occidentale*), which is federal- and state-listed as endangered and reported in the freshwater marsh south of Fields Landing (more than 1.6 km (1 mi) south of the ISFSI site), would not be affected by ISFSI-related activities at the HBPP.

Numerous special status terrestrial wildlife species occur within the ecologically diverse and productive habitats in the vicinity of the ISFSI project site. Inventories conducted in 1999 and 2002 on PG&E-owned property, including the ISFSI site, did not indicate the presence of any of these species and found that the lack of suitable habitat made their presence unlikely (PG&E, 2003a).

In the vicinity of the project, five special-status species of fish (tidewater goby, Chinook salmon, coho salmon, steelhead, and coastal cutthroat trout) occur or have the potential to occur based on the presence of suitable habitat. An inventory of PG&E-owned land, including the ISFSI site, in 1999 and 2002 did not observe these species on PG&E property or at the ISFSI site. Lack of suitable habitat for these species indicates that they are not present at the ISFSI site. Harbor seals (*Phoca vitulina*) do not have official status as a listed endangered or threatened species, but they are protected under the Marine Mammal Protection Act. Harbor seals are year-round residents of the Humboldt Bay region. The seals haul out on tidal flats in areas remote from human activity to rest and bear their young. The Humboldt Bay National Wildlife Refuge in the southern part of Humboldt Bay is a key breeding and hauling out area used by harbor seals (PG&E, 2003a).

PG&E-owned land in the vicinity of the ISFSI site was inventoried for the presence of special status freshwater aquatic species in 1999 and 2002. Five special-status freshwater aquatic species occur in the vicinity of the ISFSI project: the northern red-legged frog, the foothill yellow-legged frog, the tailed frog, the southern torrent salamander, and the northwestern pond turtle. No special status freshwater aquatic species appear to occur at the ISFSI site (PG&E, 2003a).

A habitat assessment, conducted in August 1999 using procedures approved by the U.S. Fish and Wildlife Service, found that the ISFSI site and surrounding PG&E property have limited habitat suitable for northern red-legged or tailed frogs because of the lack of freshwater streams (PG&E, 2003a). Although no frogs or tadpoles were observed at the ISFSI site, a small stream directly east of the intake canal has limited potential to be a low-quality breeding habitat for the northern red-legged frog. Additionally, there are freshwater ponds with cattails near Highway 101 that could provide foraging and dispersal habitat for northern red-legged frogs. No suitable habitat was found for the southern torrent salamander, the foothill yellow-legged frog, tailed frogs, or the northwestern pond turtle at the ISFSI site or on the adjacent PG&E property.

#### **4.8 Transportation**

The HBPP site area is not traversed by a public highway or a railroad. The only access to the proposed ISFSI site is from the south via King Salmon Avenue, which also serves the community of King Salmon situated on the western part of the peninsula. A public-access trail runs along the shoreline and along the fence to the northwest of the PG&E-controlled area.

The major travel access in the vicinity of the proposed ISFSI and other communities of Humboldt County is via US Highway 101, which generally traverses north-south through Humboldt County. This highway passes about 0.48 km (0.3 mi) southeast of the ISFSI site and is accessible approximately 0.56 km (0.35 mi) to the southeast of the site. Highway 101 continues north into Oregon and south to San Francisco and Los Angeles.

Commercial air traffic into and out of Humboldt County is primarily through the Arcata Airport, located in McKinleyville, approximately 25.75 km (16 mi) north of the proposed ISFSI site. The air transportation system in Humboldt County serves a range of aircraft types and aeronautical uses. Nine public-use airports are located in Humboldt County. Scheduled passenger service, typically turbo-prop planes, is only available from the Arcata Airport.

A set of North Coast Railroad tracks runs generally north-south along the southeastern PG&E property line. This rail system has been out of service since 1997. Presently, there are no existing plans to repair and reuse the tracks; however, the railroad owner and Humboldt County are considering this possibility.

The Port of Humboldt Bay is the largest marine shipping facility between San Francisco Bay, located 225 nautical miles to the south, and Coos Bay, Oregon, located 156 nautical miles to the north. Humboldt Bay can accommodate vessels up to 213.4 m (700 ft) long and 33.5 m (110 ft) wide, and weighing a total of 50,000 dead weight tons. On-board cranes and manpower are used to load and off-load cargo, as there are currently no dockside cranes in use. Seven port terminals are located on Humboldt Bay, with five of them located to the north of Eureka. The nearest terminal to the proposed ISFSI site is the Humboldt Bay Forest Product Dock, located just to the south of King Salmon, approximately 0.64 km (0.4 mi) from the HBPP. The Fields Landing lumber shipyard lies another 1.2 km (0.75 mi) or so further south along the shoreline.

There are several boat landings in the community of King Salmon, located just west of the entrance gate to the PG&E-controlled area. The community of King Salmon serves frequent commercial and recreational boat traffic.

#### 4.9 Regional Historic, Scenic, Cultural, and Natural Features

PG&E conducted research to identify recorded or otherwise known cultural resources within or adjacent to the HBPP site, and archaeologically sensitive portions of the study area, as determined by the locations of previously recorded archaeological sites nearby and their relationship to environmental factors and topography (PG&E, 2003a). This research involved (1) a cultural resource record search for areas up to 16.1 km (10 mi) from the HBPP site; (2) examination of archival files and records for HBPP; (3) a field survey of the HBPP and ISFSI site in May 1999; (4) examination of relevant collections at public libraries; (5) review of historical literature for the area; and (6) contact with the Humboldt County Historical Society in Eureka.

At the time of Euroamerican contact, the project area was inhabited by speakers of Wiki, a dialect of Wiyot, an Algonquian language. The Wiyot, who are thought to have arrived in the North Coastal areas at approximately 900 A.D., settled along the Pacific coast, Humboldt Bay, and along the major streams of the area, such as the Mad River. No ethnographic sites are located within the area. According to a map of ethnographic site locations made near the turn of the century, one village site was located adjacent to the project on Buhne Point, but apparently it had been washed away by 1918.

There are no archaeological resources listed on national or state registries that are located within 8.0 km (5 mi) of the proposed ISFSI. However, within a 8-km (5-mi) radius of HBPP, there are approximately 30 recorded archaeological sites that have not been evaluated with regard to their eligibility for listing in national or state registers. The archeological site that lies closest to HBPP is CA-HUM-79, located about 0.8 km (0.5 mi) away. This site was examined in 1976 and again around 1983, when a U. S. Army Corps archaeologist found that it had little or no integrity.

No cultural resources were identified within the HBPP site during the current study. Considering the amount of ground disturbance that has taken place in the project area in the past, it is highly unlikely that additional unidentified resources may be present. However, certain conditions, such as dense vegetation or pavement, may have prevented a resource from being detected during the inventory. PG&E has committed to stopping all work and notifying the PG&E archaeologist immediately should any new cultural resources be located during the proposed project activities.

PG&E's review of the historic literature indicated that the ISFSI site area was the location of the first town adjacent to Humboldt Bay and was settled by 1850. Due to the amount of earth-moving activities related to construction of the HBPP, it is unlikely that remnants of the town or any prehistoric remains would be identified during future construction activities.

Key factors of Unit 3 will not be impacted by the proposed action. PG&E is considering a future listing of the HBPP Unit 3 facility with the National Register of Historic Places (NRHP) for its importance in the history of the commercial nuclear power industry. PG&E does not plan to list the Unit 3 facility with the NRHP at this time (PG&E, 2003).

PG&E contacted the Native American Heritage Commission and several local Native American groups and individuals concerning its plans to construct and operate an ISFSI at HBPP. In addition, PG&E has committed to keeping the Native American Heritage Commission and other

interested Native-American groups and individuals informed of the ISFSI progress through periodic, publicly announced, meetings. PG&E would address any Native American comments and concerns through appropriate communication channels.

As part of its evaluation of potential impacts to cultural and historic resources, the NRC staff consulted with the California Historic Preservation Office, the Native American Heritage Commission, and three Federally-recognized Indian tribes (the Wiyot Tribe, the Bear River Band of Rohnerville Rancheria, and the Blue Lake Rancheria). Details of this consultation is provided in section 7 of this EA.

#### **4.10 Background Radiological Characteristics**

Since 1986, the radiological characteristics of the HBPP site have been evaluated as part of PG&E's SAFSTOR Radiological Environmental Monitoring Program (REMP). PG&E submits annual radiological environmental monitoring reports that contain results of both onsite and offsite sampling conducted under the REMP. The most recent monitoring report was submitted to the NRC by letter dated April 27, 2004 (PG&E, 2004).

The typical average annual total effective dose equivalent to a person living anywhere in the United States from background sources of radiation is approximately 3 mSv (300 mrem) (NCRP, 1987). This dose comes from exposures to cosmic radiation, cosmogenic radionuclides, terrestrial radionuclides, inhaled radionuclides, and radionuclides naturally occurring in the body.

In comparison, the results from PG&E's 2004 annual report indicate that direct radiation from all sources were below 1 mSv (100 mrem) at the HBPP site, despite an apparent long-term increase in both onsite and offsite annual doses of about 0.07 mSv (7 mrem) over a period of 15 years. PG&E states, however, that all measurements were comparable to the ranges observed since entering SAFSTOR, with onsite station dose levels approximately within the range of dose levels recorded at offsite stations.

### **5.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION**

#### **5.1 Non-radiological Impacts**

##### **5.1.1 Construction Impacts**

The environmental impacts due to construction of the HBPP ISFSI are expected to be small. The ISFSI would be located within the boundaries of the 143-acre PG&E-controlled site area, and constructed in an area previously disturbed during HBPP operations. Construction activities associated with the proposed ISFSI would impact less than one acre of land area. This impact would involve excavating the vault area, disposing the excavated spoils, forming and pouring of the vault structure, widening and extending the oil supply road, constructing miscellaneous structures, and controlling dust and runoff. Construction materials would be derived from offsite sources.

Dust generated during construction is expected to be minimal given that the construction traffic would be using paved onsite and offsite roadways. Dust derived from excavation and fill

operations would be mitigated through dust control techniques (e.g., watering and/or chemical stabilization). Routine truck washing and covering truck-hauled materials would contribute to minimizing dust emissions. Gaseous emissions from construction equipment would be mitigated through regular maintenance of the equipment (PG&E, 2003a).

The spoils disposal area, covering approximately 836 square meters (9000 square feet), is located within an area that had been disturbed previously by plant operations. This area would be accessed via the existing oil road, and the transport and deposition of the excavated material is not expected to have a significant environmental impact. Material disposed there would be contoured to the existing slope. As appropriate, PG&E would use best management practices to address storm water runoff, erosion control, and revegetation. All areas disturbed during construction activities would be revegetated with an appropriate seed mix.

PG&E expects that 20 to 25 construction workers would be needed for the construction activities (i.e., building the ISFSI and the security building, putting up fencing, and widening the oil road). The workers would be drawn from the local work force and therefore would have minimal impact on the local demography.

The effects of noise and traffic on the area as a result of construction activities are estimated to be small. Traffic to and from the construction site would be by way of existing paved roads and highways. The noise level from construction activities would be similar to the noise level from any similar construction project. The nearest resident is about 244 m (800 ft) from the proposed ISFSI site and should not be affected by the construction noise. The construction workers would comply with the applicable OSHA noise regulations to minimize noise impacts.

The impact of construction of the ISFSI on local water sources and wetlands is expected to be small. Discharges from the HBPP are regulated currently under a discharge permit issued by the North Coast Regional Water Quality Control Board (NCRWQCB). PG&E will take up any needed modifications to its permit with the NCRWQCB. In addition, PG&E would apply applicable BMPs during ISFSI construction to protect local waters and nearby wetlands from site runoff, spillage, and leaks.

ISFSI construction activities are not expected to impact any state or federally listed threatened or endangered plant, terrestrial wildlife, marine life, or fish species. All such species that may occur within a 8-km (5-mile) radius of the proposed facility were considered by the applicant. None of these species were found to inhabit the area on or immediately adjacent to the ISFSI site, nor were they identified at the spoils disposal site.

Construction of the proposed ISFSI would not impact identified cultural resources in the region around the HBPP site. As noted previously, the closest identified archaeological site, CA-HUM-79, was found to have little or no integrity. In addition, this site is outside the area of potential impacts from the proposed action. If any new cultural resources are located during project activities, all work must stop and the PG&E archaeologist be notified immediately.

Visual/scenic impacts would be minimized as the proposed ISFSI would be constructed as an in-ground vault, with the top of the vault approximately flush with the ground surface. The security building and the fencing would be visible from the public access path to the breakwater, but would be consistent with the visual impact from other buildings on the HBPP site.

### 5.1.2 Operational Impacts

As discussed previously, operation of the proposed ISFSI would involve loading the spent fuel into the HI-STAR HB casks while in the RFB, moving the loaded casks from the RFB to the proposed in-ground vault, placing the casks in the vault, and then closing the ISFSI. Once the vault is closed, PG&E would conduct long-term monitoring of the ISFSI and surrounding area under its Radiological Environmental Monitoring Program.

Operation of the proposed ISFSI would not require any additional land beyond that used for the vault and security building. The 18.3 m x 39 m (60 ft x 128 ft), fenced-in security area surrounding the ISFSI would not significantly effect the area available for terrestrial wildlife. In addition, ISFSI operation is not expected to adversely impact terrestrial and aquatic environments or their associated plant and animal species. Operation would not require water resources. Due to the passive nature of the ISFSI, no gaseous or liquid effluents would be produced during operation. Finally, ISFSI operation would not generate any significant noise and would not impact climate or socioeconomics.

Public access to and recreation activities on the breakwater and in the bay would not be restricted by PG&E, except during ISFSI activities that require limited access within the 100-meter (328-foot) controlled area. Such activities would be for short time periods during cask movements or handling evolutions. The evolutions would occur primarily during the initial transport of storage casks to the ISFSI and potentially not again until the casks are transported off-site to a permanent storage repository or to a privately-owned facility.

## 5.2 Radiological Impacts

### 5.2.1 Normal Operations

#### Occupational Doses

During the initial phase of ISFSI construction, the radiation dose to the construction workers would be minimal. The construction workers would only be exposed to the natural background radiation of the site.

Occupational doses may result from (1) loading the spent fuel into the multipurpose canister contained within the overpack while in the refueling building; (2) decontamination of the overpack and MPC in preparation for storage; (3) transport of the overpack from the RFB to the proposed ISFSI vault; (4) transfer of the overpack and MPC from the transporter to the vault; and (5) closing of the vault. In addition, following vault closure, occupational doses may result from security activities, inspections, and maintenance activities. All work would be done in accordance with the HBPP radiation protection program and occupational doses must be maintained below the limits set in 10 CFR Part 20.

PG&E conservatively estimated the occupational dose resulting from packing and transfer of the spent fuel from the RFB to the proposed ISFSI to be approximately 2.85 mSv/yr (285 mrem/yr). The conservative estimate of dose to workers from security, inspection, and maintenance activities is 0.092 mSv/yr (9.2 mrem/yr) (PG&E, 2003b). These doses are well below the 10 CFR 20.1201(a)(1) annual limit for occupational doses of 5 mSv (500 mrem).

## Doses to the General Public

The storage of spent fuel in casks at the ISFSI is expected to result in small radiation doses to the offsite population. The closest point that a member of the public may access (*i.e.* via the public trail) is 16.2 m (53 ft) from the ISFSI, and the nearest resident is approximately 244 m (800 ft) away. In its environmental report, PG&E provided the results of conservative calculations of offsite dose (PG&E, 2003a). These calculations assumed contributions to the total dose due to direct radiation from the spent fuel in the storage casks, as well as contributions from the spent fuel in the MPCs during their transfer to the storage overpacks and from the casks as they are transported to and loaded into the ISFSI. The MPCs would be seal-welded and therefore are considered leak tight, so that no leakage is expected during normal operation, off-normal conditions, or design basis accidents.

The dose calculations at the point of closest access assume an occupancy time of 2080 hours per year (based on a 40-hour week and 52 weeks per year) although the public trail is only occasionally used. The analysis also assumed that access to the public trail would be controlled to keep members of the public more than 100 meters (330 ft) away while the spent fuel casks are transported to and loaded into the ISFSI. The occupancy time for the nearest resident was assumed to be continuous (8760 hours per year).

The calculated annual dose to the nearest resident from ISFSI activities is 0.0631 mSv (6.31 mrem), which is significantly below the annual limits specified in 10 CFR 72.104(a) and 10 CFR 20.1301(a), of 0.25 mSv (25 mrem) and 1 mSv (100 mrem), respectively. The cumulative offsite dose to the nearest resident from all site activities is calculated to be about 0.0641 mSv/year (6.41 mrem/year), which is also significantly less than the limit referenced in 10 CFR 20.1301. Assuming an occupancy time of 2080 hours, PG&E calculated an annual dose at the point of closest access of approximately 0.21 mSv (21 mrem). Following transfer of the six casks to the ISFSI, the annual offsite dose will be limited primarily to direct radiation, thus reducing the calculated doses at the point of closest access and to the nearest resident to approximately 0.17 mSv/yr (17 mrem/yr) and 0.045 mSv/yr (4.5 mrem/yr) respectively. Given the assumptions in the calculations, actual doses are expected to be less than these values.

The NRC staff reviewed the calculations and assumptions provided by PG&E. The staff also performed confirmatory calculations to verify the source term and checked the dose rates. Based on these results, normal ISFSI operations would not have a significant onsite or offsite radiological impact.

Radiological effects on wildlife are expected to be small. The proposed ISFSI would be constructed below grade and surrounded by security fencing. No state or federally listed threatened or endangered species are present in the immediate area of the ISFSI site, and the area has a low habitat value due to its significant development and use. The fences would keep most species far enough from the vault that the resulting radiation doses should pose no threat to wildlife, although some birds and small wildlife may intrude into the ISFSI area. To receive a significant dose, birds and small animals would need to remain in almost constant contact with a storage cask. The ISFSI area would not provide a conducive environment for wildlife, and monitoring activity around the area also would discourage wildlife from remaining in the area. Therefore, very few, if any, animals are expected to receive significant radiation exposure as a result of ISFSI operation.

## 5.2.2 Accidents

In its application (PG&E, 2003a, 2003b), PG&E addressed four categories of design events as defined in ANSI/ANS-57.9, which include normal, off-normal, and accident events. Design Event I represents an event associated with normal operations, such as the normal ambient temperature range. The impacts from such events are similar to impacts due to normal operations at the ISFSI as discussed previously.

Design Event II represents an event associated with off-normal operations that can be expected to occur with moderate frequency. Such events potentially could result in members of the general public being exposed to additional levels of radiation beyond those associated with normal operations. Examples of events in this category include loss of external electrical power, off-normal ambient temperatures, off-normal pressures internal to the MPC, a cask drop from less than the allowable lift height, and off-normal transporter operation. Based on PG&E's assessment, none of the credible off-normal operations and hypothetical Design Event II accidents results in any occupational or offsite radiological consequences.

Design Event III represents an infrequent event that could be reasonably expected to occur over the lifetime of the ISFSI, while Design Event IV represents an extremely unlikely event that is postulated to occur because it establishes a conservative design basis for systems, structures, and components important to safety. Design Events III and IV include more severe events such as earthquakes; tornados and missiles generated by natural phenomena; floods; fire and explosions; lightning; canister leakage under hypothetical accident conditions; storage cask drop or tip-over; and loss of shielding. Of these events, only fire may create situations in which worker personnel and the offsite public could be exposed to higher levels of radiation than normal.

The effects of fire on the cask during transport or storage are not expected to result in significant offsite radiation doses. The cask is designed such that the MPC confinement boundary remains intact during and after a design basis fire. In addition, should a fire occur during transport of the cask to the ISFSI, PG&E would take appropriate precautionary measures, including maintenance of the 100-meter (328-foot) controlled area; radiological and visual inspection of the overpack and vault; and temporary shielding, as appropriate, around the affected area to reduce dose rates.

Design Events II through IV are addressed in greater detail in Chapter 8 of the Humboldt Bay ISFSI SAR (PG&E, 2003b).

## 5.3 Impacts of Decommissioning

Decommissioning of the ISFSI would commence after the HI-STAR HB casks loaded with the spent fuel elements and GTCC waste are removed from the vault and transported offsite. After the fuel is moved off site, the ISFSI decommissioning activities would be conducted in accordance with the NRC-approved ISFSI decommissioning plan.

Decommissioning activities would include surveying the area to determine the levels, if any, of residual radioactive material. Following removal of the casks, the vault structure would be decontaminated, as necessary. The concrete structure above the vault may be sectioned and removed, or alternately, left in place, as appropriate. After the storage vault area has been

decontaminated and/or removed from the site, the area may be covered with top soil, contoured, and replanted with native vegetation.

Small occupational exposures to workers could occur during decontamination activities, but these exposures would be much less than those associated with cask loading and transfer operations. Minor impacts from noise and dust could also result from dismantling the pad and structures, but they would be much less than similar construction impacts.

A final radiological survey would be conducted. If the results of the final survey indicate there is no residual radioactive material, then the site may be released for unrestricted use.

#### **5.4 Cumulative Impacts**

The NRC has evaluated whether cumulative environmental impacts could result from the incremental impact of the proposed action when added to the past, present, or reasonably foreseeable future actions in the area. The impact of the proposed Humboldt Bay ISFSI, when combined with previously evaluated effects from the Humboldt Bay Power Plant, is not anticipated to result in any significant cumulative impact at the site. The offsite radiation exposure limits for an ISFSI specified in 10 CFR 72.104(a) explicitly include any contribution to offsite dose from other uranium fuel cycle facilities in the region. Therefore, the offsite dose contribution from the HBPP has been included in the evaluation of radiological impacts from the proposed Humboldt Bay ISFSI.

#### **6.0 MONITORING AND MITIGATION**

In addition to the existing HBPP radiological environmental monitoring program, monitoring specifically associated with the ISFSI would be performed, such as security checks and health physics monitoring. Thermoluminescent dosimeters would be placed along the ISFSI fence line to monitor the radiation dose from the stored casks and the vault.

#### **7.0 AGENCIES AND PERSONS CONSULTED**

In accordance with NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with NMSS Programs," the NRC staff consulted with several other agencies regarding the proposed action. These consultations are intended to afford the designated State Liaison agency the opportunity to comment on the proposed action, and to ensure that the requirements of Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act are met with respect to the proposed action.

##### **7.1 California Energy Commission**

By telephone call on June 21, 2005, the NRC staff discussed its preliminary findings with Ms. Barbara Byron of the California Energy Commission (CEC). By letter dated July 15, 2005, the NRC staff sent a copy of the draft EA to CEC for its review and comment. In an August 2005 telephone call, Ms. Byron indicated that the CEC preferred an expanded discussion of seismic and tsunami hazards in the EA. The NRC staff revised the discussion of seismic and tsunami hazards in response to the CEC's comments. On behalf of the CEC, Ms. Byron provided additional editorial comments by electronic mail on September 30, 2005. In that same

electronic mail message, Ms. Byron also raised the issue of potential terrorist attacks. The Commission previously has ruled that that analysis of the possibility of a terrorist attack is “speculative and simply too far removed from the natural or expected consequences of agency action to require a study under [the National Environmental Policy Act]” (USNRC, 2002a).

## **7.2 Federally-Recognized Indian Tribes**

By separate letters, each dated May 27, 2005, the NRC staff contacted the California Native American Heritage Commission (CNAHC) and two Federally-recognized Indian Tribes, the Wiyot Tribe and the Bear River Band of Rohnerville Rancheria, and requested of each information regarding cultural resources in the vicinity of the HBPP. By letter dated July 15, 2005, the NRC staff made a similar request of a third Federally-recognized Indian Tribe, the Blue Lake Rancheria. These contacts were made to update consultations PG&E had performed as part of a 1999 cultural resources survey of the HBPP site.

By letter dated June 24, 2005, the CNAHC stated that a record search of its sacred land file did not identify the presence of Native American cultural resources in the immediate project area. By letters dated June 20, 2005, and July 25, 2005, respectively, the Bear River Band of Rohnerville Rancheria and the Wiyot Tribe both indicated their belief that cultural resources may be present on the site and potentially be impacted by the proposed action. In a phone call with a representative of the Wiyot Tribe, the NRC staff recognized that the information it provided to the Tribes in the May 27, 2005, letters, may not have been sufficient for the reader to understand fully the extent of the proposed action, and because this shortcoming may have affected the Tribes’ responses, the NRC staff provided additional information on the proposed action to all three Federally-recognized Indian Tribes by separate letters dated August 19, 2005.

Through correspondence and telephone discussions, representatives from the three Federally-recognized Indian Tribes have expressed their Tribes’ concerns over the potential for cultural resources to be affected; however, other than the Humboldt Bay ecosystem as a whole, no specific cultural resources on the HBPP site or in the vicinity of the proposed ISFSI site were identified by the Tribes. The purpose of this environmental assessment is to document the NRC staff’s evaluation of potential environmental impacts from the construction, operation, and decommissioning of the proposed ISFSI, including impacts to Humboldt Bay and its environs. The conclusion of the staff’s evaluation is provided in Section 8.0.

In addition, PG&E has committed to stopping all work and notifying the PG&E archaeologist immediately should any new cultural resources be located during the proposed project activities. Any such cultural resources inadvertently discovered would be appropriately handled and treated. In addition, PG&E would employ best management practices to protect local waters and nearby wetlands from site runoff, spillage, and leaks, as well as to address storm water runoff, erosion control, and revegetation of areas disturbed during construction. The NRC staff considers these measures to be sufficient to mitigate any potential impacts to cultural resources.

## **7.2 California Office of Historic Preservation**

By letter dated July 14, 2004, to Mr. Milford Donaldson, the California State Historic Preservation Officer (SHPO), the NRC staff requested concurrence in its determination that the

proposed action does not adversely affect any historic properties. With the letter, the NRC staff provided information from PG&E's environmental report on which the staff's determination was made. By letter dated December 16, 2004, the SHPO requested additional information in support of the NRC staff's determination. By letter dated September 29, 2005, the NRC staff provided the requested information. The SHPO concurred with the NRC staff's determination of no adverse affect by letter dated October 25, 2005.

### **7.3 U.S. Fish and Wildlife Service**

By letter dated June 4, 2004, the NRC staff requested information on endangered species and critical habitat from the U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office (USFWS/AFWO). By telephone call on June 27, 2004, Mr. Greg Goldsmith of the USFWS/AFWO indicated that the requested information was available online, through the field office's website, <http://www.ccfwo.r1.fws.gov>. The NRC staff downloaded this information on June 28, 2004, for its assessment of effects from the proposed action on any endangered or threatened species or critical habitat with the area of influence for the proposed action. On July 28, 2005, the NRC staff revisited the field office's website and confirmed that the list of endangered or threatened species had not changed.

Based on its assessment as documented in this EA, the NRC staff determined that the proposed action would have no effect on an endangered or threatened species or critical habitat within the area of influence for the proposed action. By letter dated July 29, 2005, the NRC staff notified USFWS/AFWO of its determination and provided an assessment in support of this determination.

### **7.4 U.S. NOAA Fisheries**

By letter dated June 3, 2004, the NRC staff requested information on endangered species from the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries). NOAA Fisheries responded by letter dated July 27, 2004, providing a list of endangered species that may be present in the vicinity of the proposed ISFSI. In addition, NOAA Fisheries indicated that critical habitat for one of the identified species, coho salmon, may occur in the project area, and that additional analyses may be necessary for species managed under separate Fishery Management Plans within Humboldt Bay. In a July 28, 2005 phone conversation with Ms. Diane Ashton of NOAA Fisheries, the NRC staff confirmed that there had been no changes in the listed species, although essential fish habitat for two of the species identified by NOAA Fisheries had been proposed for modification in December 2004.

Based on its evaluation, the NRC staff has determined that the proposed action would have no effect on any of the listed species or critical habitat and nor would it adversely affect essential fish habitat for Humboldt Bay (see Sections 5.1 and 5.2). The NRC staff documented this determination in a letter to NOAA Fisheries on July 29, 2005, and provided an assessment in support of this determination.

## **8.0 CONCLUSION**

The NRC staff concludes that the construction, operation, and decommissioning of the Humboldt Bay ISFSI would not result in a significant impact to the environment. Construction

impacts of the ISFSI would be minor and limited to the small area of the ISFSI site and the excavated material disposal site. The site chosen for the ISFSI on PG&E's owner-controlled area has been previously disturbed during plant operation. Similarly, the disposal site for the excavated material also is a previously-disturbed area, which would not be significantly impacted. There would be minor impacts of increased noise and dust from construction equipment and activities during the construction phase, but this phase would be of short duration and would not impact off-site populations. The workers needed during the construction phase could be obtained from the local population without an adverse impact on the demographics of the area. The proposed ISFSI area and the disposal areas have been extensively surveyed and are not known to contain any threatened or endangered species. Construction at the proposed ISFSI site would not adversely impact cultural or historic resources.

There would be no significant radiological or non-radiological environmental impacts from routine operation of the ISFSI. The ISFSI is a passive facility and no liquid or gaseous effluents would be released from the storage casks. The dose rates from the spent fuel would be limited by the design of both the storage casks and the in-ground vault. The total occupational dose to workers at the HBPP site may increase slightly due to work associated with loading, transferring, and storing the casks, but all occupational doses must be maintained below the limits specified in 10 CFR Part 20 and must be kept as low as reasonably achievable (ALARA), in accordance with PG&E's radiation protection program. The annual dose to the nearest resident from ISFSI activities is estimated to be 6.31 mrem/year, which is significantly below the limits specified in 10 CFR 72.104 and 10 CFR 20.1301(a). The cumulative dose to an individual offsite from all site activities would be 6.41 mrem/year, which is less than the limit specified in 10 CFR 20.1301. Occupational doses received by facility workers would not exceed the limits specified in 10 CFR 20.1201.

The impacts from decommissioning the ISFSI would be much less than the minor impacts of construction and operation. Very small occupational exposures could occur during decontamination activities, if they are necessary, and minor noise and dust impacts could result from dismantling the vault and associated structures.

The environmental impacts of the proposed action have been reviewed in accordance with the requirements of 10 CFR Part 51. The NRC staff has determined that the storage of spent nuclear fuel in an in-ground ISFSI at the Humboldt Bay Power Plant would not significantly affect the quality of the human environment. Therefore, an environmental impact statement is not warranted for the proposed action, and pursuant to 10 CFR 51.31, a Finding of No Significant Impact (FONSI) is appropriate.

The documents related to this proposed action are available for public inspection and copying at NRC's Public Document Room, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852. Additionally, most of these documents are available for public review through the NRC's electronic reading room, at: <http://www.nrc.gov/reading-rm/adams.html>.

## **9.0 LIST OF PREPARERS**

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## 10.0 LIST OF REFERENCES

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