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CH2MHILL

November 2, 2007

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

Re: Applicant's Responses to CEC Staff Data Request 100
Humboldt Bay Repowering Project (06-AFC-07)

Dear Mr. Kessler:

Attached are an original and 12 copies of Pacific Gas and Electric Company's responses to California Energy Commission Staff Data Request 100 for the Application for Certification for the Humboldt Bay Repowering Project (06-AFC-07). This data request response addresses the Prevention of Significant Deterioration Increments Analysis for PM_{10} as requested by the North Coast Unified Air Quality Management District.
If you have any questions about this matter, please contact me at (916) 286-0278 or Susan Strachan at (530) 757-7038.

Sincerely,

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

Attachment

cc: G. Lamberg
S. Strachan
S. Galati

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA

APPLICATION FOR CERTIFICATION FOR THE HUMBOLDT BAY REPOWERING PROJECT BY PACIFIC GAS AND ELECTRIC COMPANY

Docket No. 06-AFC-7
PROOF OF SERVICE
(Revised 10/25/07)

INSTRUCTIONS: All parties shall 1) send an original signed document plus 12 copies OR 2) mail one original signed copy AND e-mail the document to the web address below, AND 3) all parties shall also send a printed OR electronic copy of the documents that shall include a proof of service declaration to each of the individuals on the proof of service:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 06-AFC-07
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

APPLICANT

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PG&E
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San Francisco, CA 94105

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Greg.Lamberg@Radback.com

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DECLARATION OF SERVICE

I, Haneefah Walker, declare that on November 2, 2007, I deposited the required copies of the attached Responses to CEC Staff Data Request 100 filed in support of the Application for Certification for the Humboldt Bay Repowering Project (06-AFC-07) in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above. I declare under penalty of perjury that the foregoing is true and correct.

OR

Transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above.

I declare under penalty of perjury that the foregoing is true and correct.

Haneefah Walker

sierra research

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Sacramento, CA 95814
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

November 1, 2007

Richard L. Martin, Jr.
Air Pollution Control Officer
North Coast Unified Air Quality Management District
2300 Myrtle Ave
Eureka, CA 95501

Re: Revised PM_{10} Increments Analysis
PG&E's Humboldt Bay Repowering Project

Dear Mr. Martin:

Enclosed please find the revised PM_{10} increments analysis for the proposed PG&E Humboldt Bay Repowering Project (HBRP). The modeling files are provided on the enclosed DVD. This increments analysis has been revised to reflect the project changes that were analyzed in our September 2007 revised air quality impact analysis for the HBRP.

We indicated in our September 11, 2007 filing that the revised increments analysis was being prepared and would be submitted as a separate report. The increments analysis was nearly complete in mid-October, but was set aside as we worked on responding to the draft PDOC and to the CEC staff's latest round of data requests. Since the CEC staff's final data requests ask for the increments analysis to be submitted, we have finalized the analysis and are submitting it to the District as required by District and federal regulations. In compliance with NCUAQMD's protocol, we are submitting the analysis to the District first. We will forward the package to the CEC under separate cover tomorrow.

The conclusions of the original increments analysis are not affected by the changes in project design and modeling procedures. The revised analysis demonstrates that the HBRP will not cause or contribute significantly to any violations of the PM_{10} increments.

If you or Jason have any questions or wish to discuss this analysis further, please do not hesitate to call.

Sincerely,

Gary Rubenstein

enclosures

cc: Jason Davis, NCUAQMD
Greg Lamberg, Radback Energy
Scott Galati, Galati & Blek
Susan Strachan

Revised Class II Increments Analysis

Humboldt Bay Repowering Project

October 2007

This revised analysis addresses the potential impact on applicable federal Class II increments from the Humboldt Bay Repowering Project (HBRP). The analysis has been revised in accordance with the final July 2007 version of the modeling protocol and reflects the final 100-foot stack heights and emission rates upon which the September 2007 version of the ambient air quality impact analysis was based.

The first section of this report discusses the requirements for the increments analysis; the second section describes the methodology used to evaluate the project's impact on applicable increments; the third section discusses the projects and emissions sources identified that would consume increment in the project's impact areas; and the final sections discuss the modeling approach and results of the analysis.

Overview of Requirements for Increments Analysis

The federal Prevention of Significant Deterioration (PSD) program is intended to ensure that economic growth in areas with good air quality occurs without causing the deterioration of that air quality to unhealthful levels. The PSD program contains a number of requirements that apply to new or modified sources of air pollution that are located in clean air areas. In Eureka, the North Coast Unified Air Quality Management District (NCUAQMD) has been delegated authority by the EPA to administer the PSD program for NO_2, SO_2, CO, and PM_{10}/$PM_{2.5}$, the pollutants for which federal ambient standards are currently being attained. These PSD program requirements, applied on a pollutant-specific basis, include conducting an increments analysis to demonstrate that no increments will be exceeded as a result of the proposed new or modified source.

Increments are the maximum increases in concentration that are allowed to occur above baseline concentrations for each pollutant for which an increment has been established. Currently, increments have been established for NO_2, SO_2, and PM_{10}. These allowable increments are shown in the table below. No increments have yet been established for $PM_{2.5}$.

Class II Increments		
Pollutant/ Averaging Time		Allowable Class II Increments ($\mu g/m^3$)
NO_2	annual	25
SO_2	3-hour	512
	24-hour	91
	annual	20
PM_{10}	24-hour	30
	annual	17

The baseline concentrations are defined for each pollutant and averaging time, and are the ambient concentrations of each pollutant existing at the time that the first complete PSD application affecting the area is submitted. Federal regulations establish the dates after which major and minor source impacts on increment consumption need to be considered in an increments analysis, as follows:

> Major source baseline date: The date after which actual emissions associated with modifications at a major stationary source affect the available increment.
>
> Trigger date: The date after which the minor source baseline date may be established.
>
> Minor source baseline date: The earliest date after the trigger date on which a complete PSD application is received by the reviewing agency. After this date, actual emissions changes (including increases in throughput or production that do not require permit changes) from all sources (major and minor stationary sources, area sources and mobile sources) affect the available increment.

NCUAQMD regulations require that before an Authority to Construct can be issued for a facility projecting significant increases in NO_2, SO_2, or PM_{10}, the applicant must perform an increments analysis to demonstrate that the project will not cause an exceedance of the applicable increment. The HBRP is expected to result in a net reduction in NOx emissions and a minor increase in SO_2 emissions; therefore, no NO_2 or SO_2 increments analyses are required. However, the project is expected to result in net increases in PM_{10} emissions that are in excess of the applicable significance level (15 tons per year) at the stationary source. Therefore, increments analyses are required for this pollutant.

For PM_{10} in the NCUAQMD, the PM_{10} baseline and trigger dates are as follows:

PM_{10} Increment Baseline and Trigger Dates in the NCUAQMD	
Major Source Baseline Date	January 6, 1975
Trigger Date	August 7, 1977
Minor Source Baseline Date	October 20, 2006

The NCUAQMD determined that no complete PSD permit application had been received for a major source or significant modification for PM_{10} prior to the HBRP application, so the minor source baseline date is the date the HBRP application was determined to be complete. Therefore, the ambient impact of all changes in PM_{10} emissions since January 6, 1975, for major modifications to major sources that affect the applicable impact areas must be considered in the PM_{10} increments analysis.

Methodology

Establishing the Impact Area

The first step in the increments analysis is establishing the impact area for each pollutant and averaging period. The impact area includes the area where the emissions from the new source will cause a significant ambient impact. Applicable significant ambient impact levels for PM_{10} are defined in NCUAQMD and federal regulations as follows:

PM_{10} Significant Impact Levels	
Averaging Period	**Ambient Significant Level, $\mu g/m^3$**
24 hour	5
annual	1

The impact area is a circular area with a radius extending from the source to the most distant point where modeling indicates that the ambient impact will be significant.

As described in the air quality modeling analyses contained in the revised ambient air quality impact analysis submitted in September 2007, PM_{10} emissions from HBRP were modeled using the appropriate 24-hour and annual emission rates, the AERMOD (with downwash) and CTDMPLUS models (for impacts in simple and complex terrain, respectively), and five years of meteorological data from Woodley Island. Based on these modeling analyses, a region of approximately 12 km in radius surrounding the project site was identified as the area in which the proposed project could have a "significant" air quality impact on ambient PM_{10} levels.

Identifying Sources to be Included in the Increments Analysis

Once the impact area is established, sources consuming increment within the impact area must be identified and emission inventories developed for those sources. The sources include not only those located within the impact area, but also those located outside the impact area whose emissions could contribute to ambient impacts there. These inventories must account for the change in emissions between the PM_{10} major source baseline date and the date of the permit application for the new source or modification. Based on these inventories, the changes in emissions are modeled to determine the amount of increment consumed for each pollutant. These sources would include any that have had significant permitted increases in PM_{10} (greater than 15 tons per year) since the PM_{10} major source baseline date (January 6, 1975). Because District permit records make it difficult to identify sources and permit transactions that meet this criterion, it was decided, following consultation with the District and ARB staff, to simplify the analysis and make it overly conservative by evaluating the actual impacts of all major sources of PM_{10} within 50 km of the project's significant impact area. This approach assumes that none of the sources were in operation in 1975, so that all emissions from these sources are increment-consuming, and thereby overestimates potential increment consumption.

To ensure that other emission sources that might have significant impacts on the PM_{10} impact areas in conjunction with the HBRP were identified, Sierra Research requested from District staff a list of major sources of PM_{10}, with sufficient stack parameters to allow modeling of the sources' ambient impacts.

Data Used in the Increments Analysis

The data provided by the District were not in the form needed to be used directly in the increments analysis. In many cases, the data were not sufficiently detailed to be used as input to a modeling analysis. Often, too, the available information was incomplete, so that some assumptions needed to be made about source operations. Finally, so many sources were identified that an initial screening procedure was used for all point sources to reduce the scope and complexity of the final modeling runs. Following is a discussion

of the data received and the procedure used to prepare the data for the final modeling runs.

Nine facilities within 62 km of HBRP were identified by the District staff as having potentially significant PM_{10} impacts. Five of the sources were sawmills, two were independent electric power generators, one was a pulp mill, and one was a reconstituted wood product manufacturing plant. PM_{10} emissions sources at all of the plants except the pulp mill consisted mainly of biomass-fired boilers and dust collectors. The District staff provided relevant excerpts from permits and source test reports for the facilities, which contained equipment ratings, permitted emission limits, some stack parameters, and PM test results for some of the sources. A HARP database in Microsoft Access format was also provided, and some additional stack parameters could be obtained from that database. A summary of the data provided for each facility is included as Attachment 1. Attachment 1 also provides a detailed discussion of the assumptions made where there were missing and incomplete source data. Because current annual emission inventory for most sources was not available from the District, the most recent available inventory, ARB's 2004 inventory for the county, was used to represent current annual emissions when more recent data were not provided.[1,2] A copy of the 2004 inventory is included as Attachment 2. The inventory presents annual emissions for each facility as a total and does not provide unit-specific emissions.

Initial Screening Modeling Analysis

For the four facilities that were more than 5 km from the significant impact area (more than 17 km from HBRP), an initial screening analysis was used to determine whether they could be eliminated from the more detailed modeling analysis. This screening analysis used the SCREEN3 model, with default screening meteorology, to evaluate worst-case 1-hour average impacts in the HBRP significant impact area. The 1-hour average modeled impacts were converted to 24-hour average and annual average impacts using the EPA default conversion factors of 0.4 and 0.1, respectively.

For the screening analysis, all emissions from multiple similar sources were modeled as being emitted by a single source—that is, all dust collector emissions from a single dust collector and all boiler emissions from a single boiler stack. A single representative stack was selected using the procedure described in EPA's screening modeling guidance.[3] Under this procedure, the parameter M is calculated for each similar stack.

$$M = (Hs * V * Ts) / Q$$

where: M = Merged Stack Parameter

Hs = Stack Height (m)

$V = (\pi/4) * D_s^2 * Vs$ = stack gas volumetric flow (m3/s)

Ds = Inside Stack Diameter (m)

---

[1] Inventory data obtained from http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php.

[2] A 2005 inventory for Fairhaven Power was provided, so the emissions data for that facility are from 2005.

[3] USEPA, "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources," 1992.

Vs = Stack Gas Exit Velocity (m/s)

Ts = Stack Gas Exit Temp (K)

Q = Pollutant Emission Rate (g/s)

The stack that has the lowest value of M is used as a 'representative' stack. Then the sum of the emissions from all stacks is assumed to be emitted from the representative stack.

Four facilities were modeled using this approach: Simpson Korbel, Ultrapower, PALCO, and Humboldt Flakeboard. The calculation of M for each stack and the identification of the representative stack at each facility are shown in Attachment 3. The results of the screening analysis are summarized in the following table. Sources with modeled impacts within the significant impact area that were well below the significant impact levels would not contribute to violations of the increment and were eliminated from more detailed modeling.

Summary Results from SCREEN3 Modeling Analysis of Distant Sources

Facility/Location	Distance from HBRP, km	PM_{10} Emissions Source	PM_{10} Impacts at Boundary of Significant Impact Area, $\mu g/m^3$	
			24-hr average	annual average
PSD Class II Significance Impact Level	--	--	5.0	1.0
Humboldt Flakeboard Panels, Arcata	17.05	Boiler	0.8	0.0
		Dryers	1.8	0.1
		Total	2.5	0.1
Ultrapower, Blue Lake	24.25	Boiler	0.4	0.1
Simpson Korbel	26.21	Package Boiler	0.2	0.1
		Boiler	1.3	0.3
		Dust Collectors	0.9	0.2
		Total	2.4	0.6
PALCO, Scotia	30.66	Boiler	0.6	<0.1
		Boiler	0.6	<0.1
		Boiler	0.6	<0.1
		Dust Collectors	4.5	0.4
		Total	6.2	0.5

The screening modeling performed for these facilities is extremely conservative and overpredictive for several reasons:

- The representative stack technique is designed to select the stack with the worst dispersion parameters so that, for screening purposes, the maximum modeled concentration is purposely overpredicted.

- The SCREEN3 model uses worst-case screening meteorological data instead of actual representative meteorological data to conservatively overpredict maximum modeled concentrations, especially for longer-term averaging periods.

Based on the results of the screening-level modeling described above, only one of the 4 facilities located more than 5 km from the HBRP significant impact area was identified as having potentially significant PM_{10} impacts within the HBRP significant impact area. The emission rates and stack parameters used for modeling this source, along with the five facilities that are closer to HBRP, are shown in Attachment 4. The locations of the facilities are shown in Figure 1.

Refined Modeling Analysis

The sources identified in Attachment 4 were modeled in combination with the HBRP sources using AERMOD and CTDMPLUS (in simple and complex terrain, respectively) for receptors within the HBRP significant impact area. Five years of Woodley Island meteorological data were used. The existing Humboldt Bay Power Plant units were modeled with negative emission rates to account for the elimination of those emissions when the units shut down. The overall maximum annual PM_{10} impact for all increment-consuming sources is 6.4 $\mu g/m^3$, which is well below the Class II annual average PM_{10} increment of 17 $\mu g/m^3$.

The highest second high (H2H) total 24-hour average impact for all increment-consuming sources is 57.1 $\mu g/m^3$, which exceeds the Class II increment of 30 $\mu g/m^3$. However, under EPA policy, a source may obtain a PSD permit in an area where an increment is exceeded as long as the proposed source does not cause or contribute to the exceedance. By definition, the source does not cause or contribute to the exceedance if its modeled concentration is not significant. The 24-hour average impact of the proposed project is less than 5 $\mu g/m^3$ in any location in which the modeled PM_{10} impact of all increment-consuming sources exceeds 30 $\mu g/m^3$. Therefore, the proposed project, in combination with other potentially increment-consuming sources, will not cause or contribute to the violation of the PM_{10} Class II increments. A summary of modeling results is shown in the following table.

Summary of Modeling Results for PM_{10} Increments Analysis		
Sources Included	Highest 2nd High Modeled PM_{10} Impact, $\mu g/m^3$	
	24-hr average	annual average
HBRP Alone	28.1	3.1
HBRP and other major PM_{10} sources within 50 km of significant impact area	>30[4]	6.4
Class II PM_{10} Increment	30	17

[4] The contribution from HBRP is less than significant in any area where the increment is exceeded. See text.

The modeling results for the receptors where the total increment consumed exceeds 30 µg/m3 are summarized in the tables below.

Receptor-Specific Modeling Results for Locations Where Highest 2nd-High 24-Hour Average Increment Consumption Exceeds 30 µg/m³: Flat Terrain (AERMOD Results)	
Modeled Impact, All Increment-Consuming Sources (µg/m³)	Modeled Impact, HBRP (µg/m³)
54.95	0.09
44.67	0.14
44.19	0.40
42.68	0.34
39.66	0.15
38.28	0.67
36.44	0.44
36.24	0.00
35.88	0.02
34.61	0.44
34.04	0.02
33.69	0.01
33.36	0.00
32.44	0.03
32.21	0.00
30.98	0.02
30.18	0.01
30.15	0.01

Receptor-Specific Modeling Results for Locations Where Highest 2nd-High 24-Hour Average Increment Consumption Exceeds 30 µg/m³: Complex Terrain (CTDMPLUS)	
Modeled Impact, All Increment-Consuming Sources (µg/m³)	Modeled Impact, HBRP (µg/m³)
57.1	0.8
46.2	0.8
42.7	0.8
39.3	0.8
34.9	0.5
33.6	0.6
32.2	0.8
30.7	0.4

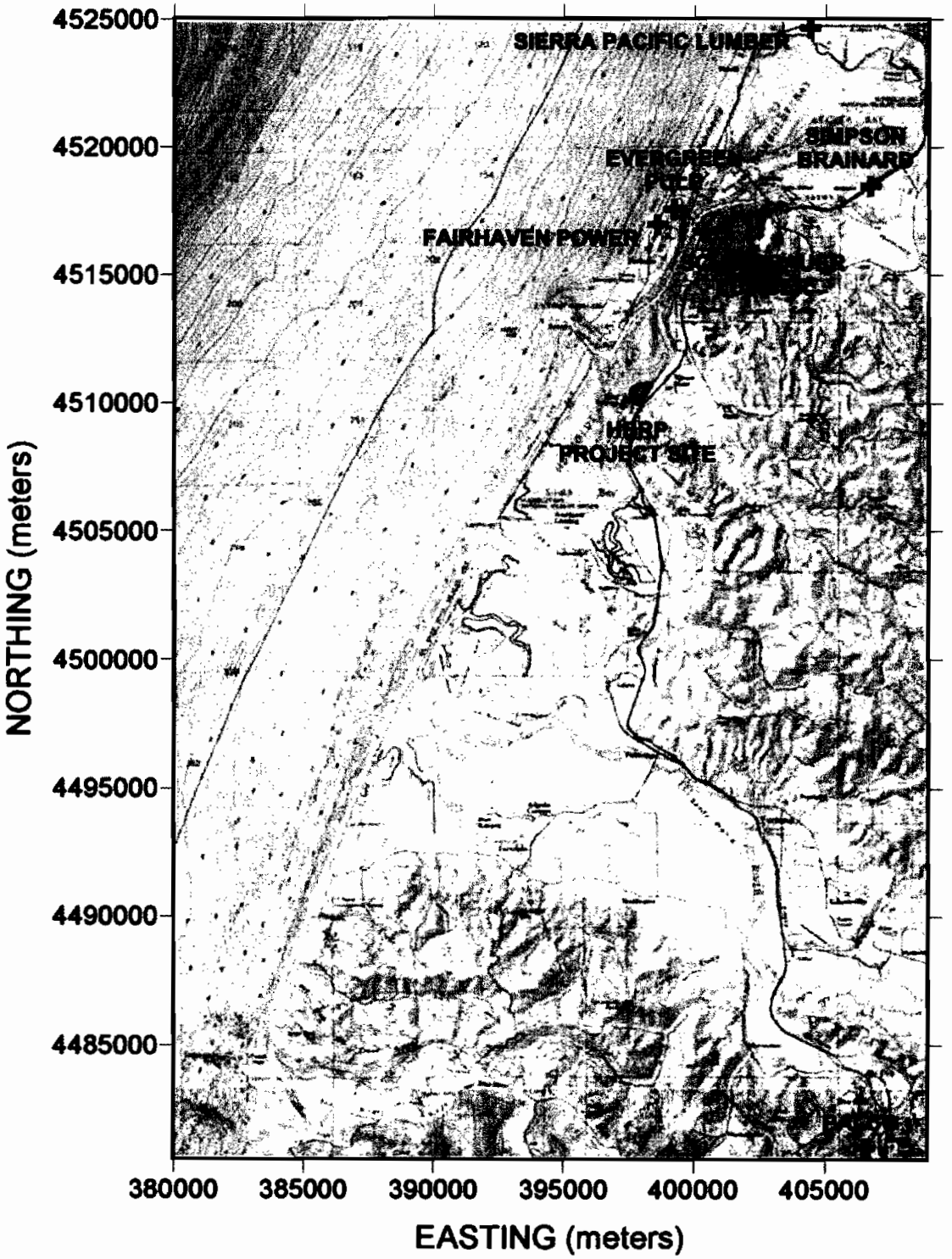
Attachment 1

Source and Emissions Data Used in the Increments Analysis

Facility	Evergreen Pulp, Inc. Samoa
Distance from HBRP	8.38 km
Distance from the Significant Impact Area	within impact area
Emissions Sources	lime kiln, recovery boiler, other wood pulp processing equipment
Document(s) Received	2005 source test report: lime kiln gaseous emissions test runs, recovery boiler particulate, opacity and gaseous emissions test runs; HRA modeling CD with AERMOD and HARP modeling files for toxic pollutants; permit
Data Received	stack parameters for all facility sources; PM_{10} lb/hr test results for recovery boiler; total annual PM_{10} emissions for facility
Missing Data	Individual hourly PM_{10} emission rates for sources other than recovery boiler; individual annual PM_{10} emission rates for all sources
Assumptions	assume lime kiln and recovery boiler are only significant PM_{10} sources; assume PM_{10} emissions from the lime kiln were 1/2 the permit limit since the source test report did not include PM_{10} and test waived if emissions less than 1/2 the limit; allocate total annual facility emission rate from 2004 ARB inventory to individual sources based on hourly emission rates

Figure 1

Locations of the PM_{10} Increment-Consuming Sources



Facility	Simpson Timber Company Korbel
Distance from HBRP	26.21 km
Distance from the Significant Impact Area	14.21 km
Emissions Sources	package boiler, steam boiler, 2 baghouses; 4 cyclone dust collectors
Document(s) Received	excerpts from 2004 source test report; Microsoft Access HARP database
Data Received	flow rates, temperatures, measured hourly PM_{10} emission rates for tested equipment, stack heights
Missing Data	annual emission rates for individual sources
Assumptions	measured emission rates from stack test were lower on a daily average basis than annual facility emissions: boiler tested at about ¼ of permit limit, so to be conservative, boilers assumed to emit at ½ their permitted emission rate; all dust collector emissions assumed to be emitted from stack for which parameters were provided; allocate total annual facility emission rate from 2004 ARB inventory to individual sources based on hourly emission rates

Facility	DG Fairhaven Power Fairhaven
Distance from HBRP	6.66 km
Distance from the Significant Impact Area	within impact area
Emissions Sources	180,000 lb steam per hour wood-fired boiler, emergency Diesel engine generator, cooling tower, fly ash conveyor, fly ash loading/unloading
Document(s) Received	Source test reports for the wood-fired boiler (July 2004 and October 2006); SCREEN3 modeling output for the wood-fired boiler; 2005 emission inventory based on PTE
Data Received	Stack parameters for wood-fired boiler; PM_{10} lb/hr test results for wood-fired boiler; annual PM_{10} emissions for wood-fired boiler based on maximum permitted emission rates
Missing Data	none
Assumptions	Use higher of the lb/MMBtu PM source test results and maximum hourly throughput to calculate hourly emissions

Facility	Ultrapower 3 Blue Lake
Distance from HBRP	24.25 km
Distance from the Significant Impact Area	12.25 km
Emissions Sources	wood-fired boiler
Document(s) Received	excerpts from 1997 source test report; Microsoft Access HARP database
Data Received	flow rates, temperatures, measured hourly PM_{10} emission rate, stack height, diameter
Missing Data	none
Assumptions	none

Facility	Simpson Timber Company Brainard
Distance from HBRP	12.08 km
Distance from the Significant Impact Area	0.08 km
Emissions Sources	wood-fired boiler, 2 baghouses, 5 cyclone dust collectors
Document(s) Received	permit; excerpts from source test reports for boiler, baghouses and 3 cyclone dust collectors; Microsoft Access HARP database
Data Received	flow rates, temperatures, measured hourly PM_{10} emission rates, permitted hourly and annual emission rates; boiler stack height
Missing Data	measured hourly PM_{10} emission rates for two cyclones; stack heights for dust collectors
Assumptions	hourly PM_{10} emission rates for missing cyclones are ½ permitted rates (emissions from tested units ranged from <1% to 18% of permitted rates); allocate total annual facility emission rate from 2004 ARB inventory to individual sources based on hourly emission rates; dust collector stack height same as boiler stack height

Facility	Sierra Pacific Lumber Arcata
Distance from HBRP	15.8 km
Distance from the Significant Impact Area	3.8 km
Emissions Sources	two boilers; two cyclone dust collectors
Document(s) Received	pages from permit; excerpts from 2004 boiler source test report ; Microsoft Access HARP database
Data Received	exhaust flow rates, temperatures and diameters for boiler stacks; measured PM_{10} emission rates; cyclone dust collector ratings; permitted PM_{10} emission limits for dust collectors; stack heights for boilers
Missing Data	emission and stack data for cyclone dust collectors
Assumptions	assume hourly emissions from cyclone dust collectors are ½ permitted emission limit (consistent with assumption for Simpson Timber); allocate total annual facility emission rate from 2004 ARB inventory to individual sources based on hourly emission rates; use lowest stack height for dust collectors

Facility	Schmidbauer Lumber Eureka
Distance from HBRP	6.87 km
Distance from the Significant Impact Area	within impact area
Emissions Sources	wood fired boiler; 4 cyclone dust collectors
Document(s) Received	pages from permit; excerpts from 2004 source test on boiler; Microsoft Access HARP database
Data Received	exhaust flow rate, stack diameter, exhaust temperature and measured hourly PM_{10} emissions from boiler; hourly and annual PM emission limits (total for cyclone dust collectors); stack height for boiler
Missing Data	stack parameters and actual PM_{10} emission rates for cyclone dust collectors
Assumptions	use stack parameters from source tests at other, similar facilities for cyclone dust collectors; assume hourly emissions from cyclone dust collectors are ½ permitted emission limit (consistent with assumption for Simpson Timber); assume dust collector stack heights are same as boiler stack heights; allocate total annual facility emission rate from 2004 ARB inventory allocated to individual sources based on hourly emission rates

Facility	Pacific Lumber Company Scotia
Distance from HBRP	30.66 km
Distance from the Significant Impact Area	18.66 km
Emissions Sources	three 235 MMBtu/hr boilers, 9 cyclone dust collectors
Document(s) Received	permit; excerpts from 2006 PM_{10} source test results for two boilers and 3 cyclone dust collectors; Microsoft Access HARP database
Data Received	permitted PM emission limits and ratings for all units; measured PM_{10} lb/hr emission rates for two boilers and 3 cyclone dust collectors; rated heat input for boilers; measured O_2 levels and stack diameters for boilers; flow rates, velocities and temperatures for tested cyclones; stack heights
Missing Data	exhaust gas flow rates and temperatures for boilers; exhaust parameters for 6 cyclone dust collectors
Assumptions	use F-factor method to calculate exhaust gas flow rates for boilers, assuming 9% moisture in stack gas and 306 deg F temp (based on Sierra Pacific wood-fired boiler test); assume all cyclone dust collectors emit at ½ their permitted limit (consistent with assumption for Simpson Timber); allocate total annual facility emission rate from 2004 ARB inventory to individual sources based on hourly emission rates

Facility	Humboldt Flakeboard Panels Arcata
Distance from HBRP	17.05 km
Distance from the Significant Impact Area	5.05 km
Emissions Sources	boiler; 3 dryers; 2 baghouses; 9 cyclone dust collectors
Document(s) Received	excerpts from source test report for boiler and 3 dryers
Data Received	exhaust flow rates and temperatures, stack diameters and PM_{10} lb/hr emission rates for tested sources
Missing Data	stack heights; emission and stack data for baghouses and cyclone dust collectors
Assumptions	assume emission points are 80 ft agl (per source test report statement that "exhaust ducts are 80 to 100 feet above ground); assume hourly emissions from baghouses and cyclone dust collectors are insignificant; allocate total annual facility emission rate from 2004 ARB inventory to individual sources based on hourly emission rates

Attachment 2

ARB 2004 PM_{10} Inventory for the NCUAQMD

CO	AB	FACID	DIS	FNAME	FSTREET	FCITY	FZIP	PM10T
12	NC	96	NCU	FAIRHAVEN POWER COMPANY	97 BAY STREET	FAIRHAVEN	95564	109.39
12	NC	37	NCU	SAMOA-PACIFIC CELLULOSE, LLC	P.O. BOX 218	SAMOA	95564	66.22
12	NC	47	NCU	HUMBOLDT FLAKEBOARD PANELS	4700 WEST END ROAD	ARCATA	95521	56.34
12	NC	60	NCU	PACIFIC LUMBER COMPANY, THE	SCOTIA	SCOTIA	95565	54.31
12	NC	84	NCU	SIERRA PACIFIC EMMERSON DIV	SAMOA ROAD, MANILA	ARCATA	95521	43.59
12	NC	72	NCU	SIMPSON TIMBER COMPANY	KORBEL	KORBEL		40.26
12	NC	59	NCU	P G & E-HUMBOLDT BAY PLANT	1000 KING SALMON AVE	EUREKA	95501	24.87
12	NC	4	NCU	SIMPSON TIMBER CO.	HWY 101	EUREKA	95501	20.92
12	NC	95	NCU	SCHMIDBAUER LUMBER	FT. OF CLARK	EUREKA	95501	11.22
12	NC	737	NCU	WALTON PAVING INC.	HATCHERY ROAD	BLUE LAKE	95525	1.38
12	NC	83	NCU	GRANITE CONSTRUCTION - ARCATA	GUINTOLI LANE	ARCATA	95521	0.51
12	NC	596	NCU	CALGON CARBON CORP.	HATCHERY ROAD	BLUE LAKE	95525	0.43
12	NC	88	NCU	MERCER FRASER - COOKS VALLEY	HWY 101	COOKS VALLEY	95501	0.40
12	NC	61	NCU	PACIFIC LUMBER CO., HOTMIX	S. HWY 101	SCOTIA	95565	0.29
12	NC	749	NCU	MERCER FRASER - PLANT B	DINSMORE DR.	FORTUNA	95540	0.25
12	NC	81	NCU	MERCER FRASER - WILLOW CREEK	HWY 96	WILLOW CREEK	95573	0.12
12	NC	91	NCU	CHEVRON BULK TERMINAL	3400 CHRISTIE STREET	EUREKA	95501	0.00
12	NC	98	NCU	EEL RIVER SAWMILLS	26011 AVE. OF THE GIANTS	REDCREST	95569	0.00
12	NC	97	NCU	ULTRAPOWER 3	INDUSTRIAL PARK	BLUE LAKE	95525	0.00

Attachment 3

Calculation of Merged Stack Parameter M and Results for SCREEN3 Modeling

HBRP PM10 Increments Analysis
Screening Procedure

Calculating Merged Stack Parameter M

Facility	Source	Stack Ht (m)	Stack Flow (m3/s)	Exhaust Temp (deg K)	Emission Rate (g/s)	M	Stack Ht (ft)	Stack Flow (ft3/s)	Exhaust Temp (deg F)	Emission Rate (lb/hr)
Humboldt Flakeboard	core dryer	24.4	24.72	327.11	0.66	299,441	80	872.8167	129.4	5.225
Panels, Arcata	**swing dryer**	**24.4**	**25.41**	**328.72**	**0.87**	**234,671**	80	897.1833	132.3	6.887
	surface dryer	24.4	24.60	324.33	0.40	487,627	80	868.6167	124.4	3.166
PALCO, Scotia	#373 cyclone	32.0	1.19	295.78	0.03	437,989	105	42	73	0.204
	#383 cyclone	32.0	0.59	292.44	0.02	323,243	105	20.9	67	0.136
	#374 cyclone	**32.0**	**1.18**	**291.33**	**0.09**	**117,632**	105	41.76667	65	0.744

Bold font indicates source parameters used for SCREEN3 modeling.

HBRP
SCREEN3 Results for Facilities More Than 5 km from the SIA

Facility	Emissions Source	Stack Diam, m	Stack Height, m	PM10 Em Rate, g/s		Distance from HBRP, m	SCREEN3 modeled conc, ug/m3/g/s	PM10 Impacts	
				24-hr avg	ann avg			24 hr avg	ann avg
Ultrapower	Boiler	0.693	30.480	0.4536	0.2638	24.25	2.27	0.4	0.1
Humboldt Flakeboard	Boiler	2.186	24.384	0.270	0.0455	17.05	7.17	0.8	0.0
Panels	Dryers	0.695	24.384	1.925	0.3245	17.05	2.28	1.8	0.1
	Total							2.5	0.1
Simpson Korbel	Package Blr	2.136	23.470	0.076	0.0756	26.21	7.009	0.2	0.1
	Boiler	1.213	23.470	0.813	0.8127	26.21	4.0	1.3	0.3
	Dust Collectors	2.413	24.384	0.270	0.2698	26.21	7.917	0.9	0.2
	Total							2.4	0.6
PALCO	Boiler 1	0.582	32.004	0.775	0.2515	30.66	1.9	0.6	0.0
Scotia	Boiler 2	0.582	32.004	0.753	0.2446	30.66	1.9	0.6	0.0
	Boiler 3	0.582	32.004	0.764	0.2480	30.66	1.9	0.6	0.0
	Dust Collectors	1.353	32.004	2.520	0.8181	30.66	4.44	4.5	0.4
	Total							6.2	0.5

Attachment 4

Emission Rates and Stack Parameters Used in the PM_{10} Increments Analysis

HBRP
Emission Rates and Stack Parameters for Increments Modeling

		Stack Diam, m	Stack Height, m	Exh Temp, Deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	PM10 Em Rate, g/s	
							24-hr avg	ann avg
Evergreen Pulp	Lime Kiln	1.480	22.860	347.444	13.36	7.768	1.796	1.4714
	Recovery Blr	3.244	88.392	439.111	108.55	13.131	0.529	0.4337
Fairhaven Power	Boiler	2.134	30.480	461.222	55.92	15.6394	1.622	1.6222
Simpson Brainard	Boiler	1.067	15.240	468.556	9.42	10.5379	0.788	0.3117
	#382 collector	0.559	15.240	296.889	6.47	12.7508	0.081	0.0319
	#083 collector	0.559	15.240	296.889	6.47	12.7508	0.081	0.0319
	#305 collector	0.432	15.240	293.000	3.99	11.3843	0.242	0.0959
	#320 collector	0.381	15.240	289.111	2.27	24.4348	0.036	0.0142
	#421 collector	0.914	15.240	292.444	11.28	17.0180	0.092	0.0364
	#084 collector	0.495	15.240	290.222	4.34	23.6220	0.202	0.0798
Sierra Pacific Lumber	West Boiler	0.597	10.058	425.222	3.99	14.2615	0.228	0.0810
Arcata	East Boiler	0.597	10.973	443.556	4.58	16.3781	0.278	0.0989
	#044 cyclone DC	1.067	9.144	293.000	18.88	21.1202	1.935	0.6874
	#369 cyclone DC	1.067	9.144	293.000	10.62	11.8801	1.089	0.3867
PALCO	Boiler 1	2.134	32.004	425.222	27.43	7.6719	0.775	0.2515
Scotia	Boiler 2	2.134	32.004	425.222	27.43	7.6719	0.753	0.2446
	Boiler 3	2.134	32.004	425.222	27.43	7.6719	0.764	0.2480
	#373 cyclone DC	0.449	32.004	291.333	7.98	12.8016	0.802	0.2604
	#383 cyclone DC	0.449	32.004	291.333	3.35	6.3703	0.337	0.1094
	#374 cyclone DC	0.449	32.004	291.333	13.73	12.7305	1.381	0.4483
Schmidbauer Lumber	Boiler	0.914	12.192	445.889	7.87	11.9911	0.583	0.0744
Eureka	Dust Collectors	1.219	12.192	293.000	9.44	8.0851	1.947	0.2483

CH2MHILL TRANSMITTAL

To: Mr. John Kessler
Project Manager
California Energy Commission
1516 Ninth Street
Sacrament, CA 95814

From: CH2M HILL

Attn: CEC Dockets

Date: November 2, 2007

Re: Humboldt Bay Repowering Project (06-AFC-07) Responses to CEC Staff Data Request 100

We Are Sending You:		Method of shipment:	
X	Attached	Under separate cover via	
	Shop Drawings	Documents	Tracings
	Prints	Specifications	Catalogs
	Copy of letter	Other:	

Quantity	Description
5	CD of Revised Class II Increments Analysis - October 2007
12	Hard Copies of PG&E's responses to CEC Staff Data Request 100 for the Application for Certification for the Humboldt Bay Repowering Project (06-AFC-07)

If the material received is not as listed, please notify us at once.

Remarks:

Copy To: