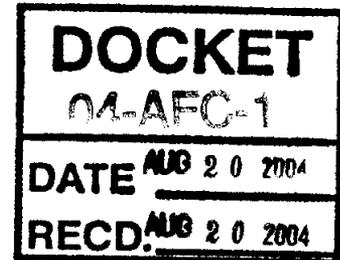


CH2M HILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833



CH2MHILL

August 20, 2004
184288



Mr. William Pfanner
Siting Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814-5504

RE: Informal Data Response, Set 2
San Francisco Electric Reliability Project (04-AFC-1)

Dear Bill:

On behalf of the City of San Francisco, please find attached 12 copies and one original of the Informal Data Response, Set 2, in response to Staff's Informal Data Requests received at the Data Response Workshop held on July 19, 2004. We are filing copies of this Informal Data Response both electronically and in hard copy.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

c: Project File
Proof of Service List

**SAN FRANCISCO ELECTRIC
RELIABILITY PROJECT
(04-AFC-1)**

**INFORMAL DATA RESPONSE SET 2
(PH-120 through PH-123)**

Submitted by
CITY AND COUNTY OF SAN FRANCISCO

August 20, 2004



2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

Technical Area: Public Health
Author: Alvin Greenberg, Ph.D.
SFERP Author: Gary Rubenstein

ISSUE/DATA REQUEST

The construction lay down area appears to be approximately 2 blocks south of the project site, thus necessitating an approximately 4-block trip via streets. Round trip from the construction lay down area and return would therefore be 8 blocks. Many trips will be made between the lay down area and the site by diesel trucks. In order to adequately assess the impacts to public health the construction phase may have, it is necessary to have information regarding the frequency of diesel truck trip between these two areas and to have the health impacts of diesel truck emissions assessed. Additionally, fabrication and other construction related activities often occur in lay down areas and some of these may have air borne emissions. Finally, the San Francisco Municipal Railway already has two MUNI bus yards in the area, one at Tubbs Street and Indiana, and the other at Islais Creek, and plans to build a third diesel bus maintenance yard next to the existing one on Islais Creek. Information is needed about the potential impacts to public health posed by diesel emissions from these areas

DATA REQUEST

PH-120. Please provide the estimated number of diesel vehicle trips between the construction lay down area and the project site, and number of return trips to the lay down area for the duration of the life of the construction lay down area.

Response: We expect that there will be an average of 5 Diesel vehicle round trips daily between the construction laydown area and the project site over the life of the construction laydown area.

PH-121. Please provide a health risk assessment of the impacts of diesel particulate emission along the route between the construction lay down area and the project site for the construction phase of this project, using an appropriate air dispersion model.

Response: The requested health risk assessment is described in detail in Attachment PH-121. The maximum cancer risk from Diesel particulate emitted by the construction vehicles traveling along this route was determined to range from 0.006 to 0.009 in one million, far below the one in one million risk that is considered to be a level of concern.

PH-122. Please identify any prefabrication or other construction related activities that will occur in the construction lay down area that might result in air borne emissions.

**SAN FRANCISCO ELECTRIC RELIABILITY PROJECT
(04-AFC-1)
INFORMAL DATA RESPONSE SET 2**

Response: The ambient air quality impact analysis prepared for the construction phase of the project used the assumption that half of the construction-related emissions, including Diesel construction equipment activity, occur at the laydown area. Therefore, the potential impact of construction-related activities in the laydown area has already been evaluated.

PH-123. Please describe in detail the activities that occur at the present facilities and which will occur at the new maintenance yard specifically including the number and frequency of diesel fueled busses arriving at, leaving from, and idling at these locations.

Response: The two existing MUNI bus yards are the Woods Division, at Tubbs and Indiana Streets, and the Marin Division, at 1399 Marin Street. The Marin Division is a storage yard – no revenue vehicles operate out of this location. Vehicles stored here include maintenance support vehicles, historic buses, buses that have been damaged in accidents, and specialty vehicles.

Woods Division houses approximately 196 motor coaches; activities at this yard include bus maintenance and heavy repair, paint and body shops, and cable car construction. There are also approximately 30 non-revenue vehicles currently based at this location. As 15 to 20% of the buses stored at Woods are undergoing maintenance, only about 160 buses operate out of this location daily. Approximately half of the buses operate all day long while half operate only during the morning and evening peak hours. Therefore about 80 buses leave from and return to this location once per day and about 80 buses leave from and return to this location twice each day. Each bus idles on average approximately 5 minutes before it leaves and approximately 3 minutes when it returns. The non-revenue vehicles are dispatched only when needed for vehicle or line maintenance or repair, so these vehicles are not in regular operation.

The new Islais Creek maintenance facility will be constructed across the street from the Marin Division and is scheduled for completion in 2008. This facility will house approximately 100 Diesel buses and MUNI's 56 new hybrid-electric buses, as well as 19 non-revenue vehicles. The facility is also being designed to include a maintenance facility for electric drive and lighter-than-air fueled buses. Operational patterns at Islais Creek are expected to be similar to those at Woods: 15-20% of the buses will be undergoing maintenance at any given time, so only about 130 buses will operate out of the Islais Creek facility each day. As at Woods, approximately 65 of the buses will leave from and return to this location once each day and the other 65 buses will leave from and return twice each day. Idle times are expected to be under 5 minutes. Many non-revenue vehicles will move from Woods to Islais Creek, for a total of about 35 non-revenue vehicles between Woods and Islais Creek. Therefore, the number of non-revenue vehicles at Woods will be lower once Islais Creek begins operation. As at the Woods Division, the non-revenue vehicles would be

**SAN FRANCISCO ELECTRIC RELIABILITY PROJECT
(04-AFC-1)
INFORMAL DATA RESPONSE SET 2**

dispatched only when needed for vehicle or line maintenance or repair, so these vehicles would not be in regular operation.

Assessment of Cancer Risk from Diesel Construction Traffic Between Laydown Area and Construction Site

The applicant estimates the number of heavy duty Diesel trucks that will travel between the laydown area on 25th Street and the project site on 23rd Street to be between 5 and 10 per day during peak construction periods. Based on this, we estimate that there will be an average of approximately 5 truck trips per day between the laydown area and the construction site for the 250-day construction period (50 weeks, 5 days/week).

The trucks are expected to follow the following route:

- Exit laydown area on 25th Street at northeast corner; travel west on 25th Street to Illinois Street
- Travel north on Illinois Street to 23rd Street
- Travel east on 23rd Street to construction site; enter construction site at center of area

The return trip would reverse the route. This route measures 0.67 miles one way, or 1.34 miles round trip. With 5 trips per day and 250 construction days, the total distance traveled by the trucks along this route is estimated to be 1675 miles during the one-year construction period.

Using EMFAC2002 V2.2, we calculate a fleetwide average exhaust PM₁₀ emission factor of 5.435×10^{-4} lb/mi (0.2465 g/mi) for heavy duty Diesel trucks in San Francisco County in 2005.¹ This EMFAC emission factor combined with the total mileage calculated above gives a total of 0.91 lb/yr (412.9 g/yr) of Diesel exhaust PM₁₀ emissions from this construction-related traffic. Based on 10 hours of construction activity each day, this converts to an emission rate for modeling of 4.59×10^{-5} g/s.

We then used the risk assessment module of HARP to calculate cancer risk for unit impact emission rates using average point estimate, high-end point estimate, the derived OEHHA method and the derived adjusted method. The cancer risk values from HARP, obtained in units of per ug/m³ per g/s, were multiplied by the emission rate above to determine input values to use for modeling cancer risk. Following the methodology outlined in Section 11 of the OEHHA “Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments” (August 2003), we adjusted the input value to reflect the exposure duration. The cancer unit risk factors used in risk assessments are based on an assumption of lifetime exposure duration (70 years). The construction activities related to the SFERP are expected to last only one year; however, to be conservative, a construction period of 18

¹ EMFAC calculates HDDT exhaust PM₁₀ emissions to be 0.15 tons per day in SF County in 2005, based on 552,000 miles of travel per day.

**SAN FRANCISCO ELECTRIC RELIABILITY PROJECT
(04-AFC-1)
INFORMAL DATA RESPONSE SET 2**

months is assumed for this risk assessment. Section 11.2 of the OEHHA guidance provides an equation for inhalation dose that can accommodate direct exposure durations. The equation is as follows:

$$\text{DOSE} = (\text{Cair} \times \text{BR} \times \text{ED} \times \text{EF} \times 1 \times 10^{-6}) / [\text{AT}]$$

Where:

- DOSE = Inhalation dose [(mg/kg body weight)/day]
- Cair = Average annual air concentration of contaminant (ug/m³)
- BR = Average daily breathing rate (L/day * kg body weight)
- EF = Exposure frequency, days/year
- ED = Exposure duration, in years
- 1x10⁻⁶ = Conversion factor (ug/m³ to mg/L)
- AT = Averaging time (period over which exposure is averaged, in years); for carcinogenic effects the averaging time is 70 years = 25,500 days

Since the exposure duration is 1.5 years, the inhalation dose factor is adjusted by ED/AT = 1.5/70 = 0.021. All of the cancer risk from Diesel exhaust particulate is due to inhalation effects, so this factor is used to adjust the risk values used for input to the modeling analysis.

The following table summarizes the input values used and the results of the cancer risk assessment. This risk assessment shows that the maximum cancer risk from the movement of construction trucks between the laydown area and the construction site will be between 0.006 and 0.009 in one million.

TABLE PH-121 Input Values and Modeling Results for Assessment of Cancer Risk from Construction Traffic^{a, b}				
	Average Risk	High-End Risk	Derived (OEHHA) Method	Derived (Adjusted) Method
Cancer Risk, per ug/m ³ per g/s	6.13x10 ⁻⁶	8.89x10 ⁻⁶	8.89x10 ⁻⁶	6.84x10 ⁻⁶
Risk Rate, per ug/m ³	2.811x10 ⁻¹⁰	4.078x10 ⁻¹⁰	4.078x10 ⁻¹⁰	3.135x10 ⁻¹⁰
Maximum Modeled Cancer Risk	0.0060 in one million	0.0088 in one million	0.0088 in one million	0.0067 in one million
Note:				
a. Based on 4.59x10 ⁻⁵ g/s emission rate				
b. Based on a maximum of 18 months of exposure.				

Copies of the HARP output are attached.

**SAN FRANCISCO ELECTRIC RELIABILITY PROJECT
(04-AFC-1)
INFORMAL DATA RESPONSE SET 2**

HARP Output

This file: C:\HARP\projects\demo\OEHHAPointEstimateRisk.txt

Created by HARP Risk Module Version: 21.7.30
 Creation date: 8/2/2004 11:30:34 AM

EXCEPTION REPORT
 (there have been no changes or exceptions)

Point Estimate
 GLC source: values edited by user
 Exposure Duration: 70 year (adult resident)
 Analysis Method: Derived (OEHHA) Method

CHEMICAL CROSS-REFERENCE TABLE

CHEM	CAS	ABBREVIATION	POLLUTANT NAME
0001	9901	DieselExhPM	Diesel engine exhaust, particulate matter

CHEMICAL GROUND LEVEL CONCENTRATIONS (micrograms/m³)

CHEM	CAS	ABBREVIATION	AVERAGE	HOURLY MAX	WATER	PASTURE	FISH
0001	9901	DieselExhPM	1.000E+00	1.000E+00	0.000E+00	0.000E+00	0.000E+00

DOMINANT PATHWAYS FOR CANCER

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	YES	-	-	-	-	-	-	-	-	-	-	-

DERIVED DOSE BY PATHWAY (mg/(kg-d)) FOR CANCER CALCULATIONS

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	TOTAL
0001	3.77E-04	0.00E+00	3.77E-04										

DERIVED CANCER RISK

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
0001	4.15E-04	0.00E+00	4.15E-04												
SUM	4.15E-04	0.00E+00	4.15E-04												

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

This file: C:\HARP\projects\demo\AvgPointEstimateRisk.txt

Created by HARP Risk Module Version: 21.7.30
 Creation date: 8/2/2004 11:29:41 AM

EXCEPTION REPORT

(there have been no changes or exceptions)

Point Estimate

GLC source: values edited by user
 Exposure Duration: 70 year (adult resident)
 Analysis Method: Average Point Estimate

CHEMICAL CROSS-REFERENCE TABLE

CHEM	CAS	ABBREVIATION	POLLUTANT NAME
0001	9901	DieselExhPM	Diesel engine exhaust, particulate matter

CHEMICAL GROUND LEVEL CONCENTRATIONS (micrograms/m³)

CHEM	CAS	ABBREVIATION	AVERAGE	HOURLY MAX	WATER	PASTURE	FISH
0001	9901	DieselExhPM	1.000E+00	1.000E+00	0.000E+00	0.000E+00	0.000E+00

AVERAGE DOSE BY PATHWAY (mg/(kg-d)) FOR CANCER CALCULATIONS

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	TOTAL
0001	2.60E-04	0.00E+00	2.60E-04										

AVERAGE CANCER RISK

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
0001	2.86E-04	0.00E+00	2.86E-04												
SUM	2.86E-04	0.00E+00	2.86E-04												

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

AvgPointEstimateRisk.txt

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

This file: C:\HARP\projects\demo\AdjPointEstimateRisk.txt

Created by HARP Risk Module Version: 21.7.30
 Creation date: 8/2/2004 11:30:52 AM

EXCEPTION REPORT

(there have been no changes or exceptions)

Point Estimate

GLC source: values edited by user
 Exposure Duration: 70 year (adult resident)
 Analysis Method: Derived (Adjusted) Method

CHEMICAL CROSS-REFERENCE TABLE

CHEM	CAS	ABBREVIATION	POLLUTANT NAME
0001	9901	DieselExhPM	Diesel engine exhaust, particulate matter

CHEMICAL GROUND LEVEL CONCENTRATIONS (micrograms/m³)

CHEM	CAS	ABBREVIATION	AVERAGE	HOURLY MAX	WATER	PASTURE	FISH
0001	9901	DieselExhPM	1.000E+00	1.000E+00	0.000E+00	0.000E+00	0.000E+00

DOMINANT PATHWAYS FOR CANCER

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
0001	A	-	-	-	-	-	-	-	-	-	-	-

DERIVED DOSE BY PATHWAY (mg/(kg-d)) FOR CANCER CALCULATIONS

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	TOTAL
0001	2.90E-04	0.00E+00	2.90E-04										

DERIVED CANCER RISK

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
0001	3.19E-04	0.00E+00	3.19E-04												
SUM	3.19E-04	0.00E+00	3.19E-04												

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.02

DRINKING WATER

*** pathway disabled ***

FISH

*** pathway disabled ***

PASTURE

*** pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

This file: C:\HARP\projects\demo\HEPointEstimateRisk.txt

Created by HARP Risk Module Version: 21.7.30
 Creation date: 8/2/2004 11:30:16 AM

EXCEPTION REPORT

(there have been no changes or exceptions)

Point Estimate

GLC source: values edited by user
 Exposure Duration: 70 year (adult resident)
 Analysis Method: High-end Point Estimate

CHEMICAL CROSS-REFERENCE TABLE

CHEM	CAS	ABBREVIATION	POLLUTANT NAME
0001	9901	DieselExhPM	Diesel engine exhaust, particulate matter

CHEMICAL GROUND LEVEL CONCENTRATIONS (micrograms/m³)

CHEM	CAS	ABBREVIATION	AVERAGE	HOURLY MAX	WATER	PASTURE	FISH
0001	9901	DieselExhPM	1.000E+00	1.000E+00	0.000E+00	0.000E+00	0.000E+00

HIGH-END DOSE BY PATHWAY (mg/(kg-d)) FOR CANCER CALCULATIONS

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	TOTAL
0001	3.77E-04	0.00E+00	3.77E-04										

HIGH-END CANCER RISK

CHEM	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
0001	4.15E-04	0.00E+00	4.15E-04												
SUM	4.15E-04	0.00E+00	4.15E-04												

SITE PARAMETERS

DEPOSITION

Deposition rate (m/s) 0.02

DRINKING WATER

*** Pathway disabled ***

FISH

*** Pathway disabled ***

PASTURE

*** Pathway disabled ***

HOME GROWN PRODUCE

*** Pathway disabled ***

HEPointEstimateRisk.txt

PIGS, CHICKENS AND EGGS

*** Pathway disabled ***

DERMAL ABSORPTION

*** Pathway enabled ***

SOIL INGESTION

*** Pathway enabled ***

MOTHER'S MILK

*** Pathway enabled ***

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

APPLICATION FOR CERTIFICATION)	Docket No. 04-AFC-1
FOR THE SAN FRANCISCO ELECTRIC)	
RELIABILITY PROJECT)	PROOF OF SERVICE
<hr/>		*Revised 7/9/04

I, Anar Bhimani, declare that on August 20, 2004, I deposited copies of the attached Informal Data Response, Set 2 in the United States mail at Sacramento, CA with first class postage thereon, fully prepaid, and addressed to the following:

DOCKET UNIT

Send the original signed document plus 12 copies to the following address:

**CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 01-AFC-17
DOCKET UNIT, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512**

In addition to the documents sent to the Commission Docket Unit, also send individual copies of all documents to:

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


Anar Bhimani