URS

August 11, 2005

Dr. James Reede
PEF Expansion AFC Project Manager
California Energy Commission
1416 Ninth Street
Sacramento, CA 95814

Dear Dr. Reede/California Energy Commission,

Per Calpine Corporation's direction and request, URS Corporation hereby submits 15 hardcopies and one CD containing the electronic files of the final Data Responses (Package No. 2) to address formal and informal Data Requests for the Pastoria Energy Facility 160 MW Expansion Project AFC (05-AFC-1). These final responses and supporting information attachments are the Data Responses that were not yet addressed as of the CEC Issues Workshop, held on July 26, 2005. The hardcopies of this Data Response Package No. 2 shall be docketed on Friday, August 12th.

Please do not hesitate to contact Autumn McKee or Jennifer Scholl at (805) 964-6010, with any questions or concerns.

Sincerely,
URS CORPORATION

URS Corporation
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117
Tel: 805.964.6010
Fax: 805.964.0259
www.urscorp.com

PASTORIA ENERGY FACILITY 160 MW EXPANSION
DATA REQUEST PACKAGE NO. 2
05-AFC-1

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05-AFC-1
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TECHNICAL AREA: AIR QUALITY
AUTHOR: WILLIAM WALTERS

SELECTIVE CATALYTIC REDUCTION SYSTEM

BACKGROUND

Staff is not aware of any General Electric 7F series turbines operating in simple cycle that also have a Selective Catalytic Reduction (SCR) system. The AFC does not provide adequate description of the SCR system and ancillary equipment necessary for the operation of SCR system on a 7F simple cycle turbine. Staff requires additional information to assess the SCR system and its reliability for this project.

DATA REQUEST

8. General Electric performance data for the 7FA turbine indicates a turbine exhaust temperature of over 1,100°F. Based on AFC Table 5.2-15, it appears that a dilution air system will be incorporated into the design to get the exhaust temperature into the 800°F range that is acceptable for the SCR catalyst. However, other than one note in Table 5.2-15, there is no information provided for the dilution air system. Please confirm that a dilution air system will be used and provide an engineering description of the dilution air system and the related equipment.

Response to Data Request 8: We confirm that a dilution air system will be used to cool the combustion turbine exhaust to an acceptable temperature (below 830-850 F) for the SCR catalyst. The dilution air system will consist of a single fan equipped with a rain hood, inlet filter, inlet silencer, and outlet expansion joint. The dilution air fan will be a skid-mounted 4160 V electric motor driven centrifugal fan. The fan discharges into a plenum, which distributes the ambient tempering air into the hot exhaust stream. The fan will be started during the combustion turbine startup and is expected to operate continuously during all combustion turbine operation. There will be a control loop monitoring the catalyst inlet temperature by averaging temperature elements at several locations.

10. Please describe the turbine startup and shutdown sequencing with respect to the dilution air system and describe the control measures that will ensure that damaging exhaust temperatures will not reach the SCR catalyst.

Response to Data Request 10: As mentioned in the response to Data Request 8, the fan will be started during the combustion turbine startup and is expected to operate continuously during all combustion turbine operation. There will be a control loop monitoring the catalyst inlet temperature by averaging temperature elements at several locations. If the temperature sensors determine a grid-average temperature in excess of the catalyst manufacturer's recommended maximum continuous operating level, an alarm will sound and the turbine will trip. Prior to final fabrication, a three-dimensional computational fluid dynamics model (and

possibly a flow model test, as necessary) will be developed to determine if any additional measures (e.g., distribution grids) are needed to maintain proper flow and temperature distribution across the SCR catalyst.

11. Please provide:

a. The SCR vendor name,

b. SCR vendor specifications for the SCR system, and,

c. Vendor guarantees for the proposed 2.5 ppm NO_x limit and proposed 10 ppm ammonia slip limit.

Response to Data Request 11:

a. The SCR will be included in the scope of supply for the exhaust system contract, which has not been issued at this time. One of the possible vendors for the exhaust system is Nooter/Eriksen.

b. The exhaust system will include the exhaust duct, 1x100% air dilution fan, ammonia injection grid, SCR catalyst, exhaust stack, platforms, support steel, insulation, instrumentation, EPA test ports, CEM ports, expansion joints, etc. Please see the response to Data Request #8 for more information on the air dilution fan system. The SCR system will include a medium temperature SCR catalyst with an average inlet temperature of approximately 830-850°F. It will be specified to reduce NO_x emissions from an inlet of 9 ppmvd at 15% O_2 to an outlet of 2.5 ppmvd at 15% O_2 with a maximum ammonia slip of 10 ppmvd at 15% O_2.

Applicant is also not aware of any GE 7F series turbines operating in simple cycle with an SCR system. However, Applicant has multiple LM6000 units in California operating in simple cycle with an SCR system. While the 7F turbines are larger and have higher exhaust temperatures than the LM6000 turbines, the technology and method for reducing the exhaust temperature to an acceptable level for the SCR catalyst is the same and easily scalable.

c. Nooter/Eriksen has provided a letter indicating their ability to meet the proposed NO_x and ammonia slip limits – see Attachment AQ-11.

12. Please identify, to the best of your knowledge, if there are any operating GE 7FA simple cycle turbines that have SCR catalysts and provide their permitted NO_x emission limits.

Response to Data Request 12: The applicant is not aware of any operating GE 7FA simple cycle turbines that have SCR catalysts.

DISPERSION MODELING – MODELING RESULTS

BACKGROUND

The near-field operating and cumulative emissions refined modeling impact analysis uses the ISCST3 and CTSCREEN models. However, the presentation of the results does not always clearly indicate which model applies to the results presented. In order to review the modeling analysis in the time available in a 12-month licensing process, staff needs additional information to clearly understand which modeling results refer to which modeling files.

DATA REQUEST

25. Please provide a chart that notes which output modeling files, by file name, were used to present each of the results presented in AFC Tables 5.2-23, -24, -26, and -27.

Response to Data Request 25: The requested chart is provided in Attachment AQ-25 and, under separate cover as a CD.

29. Please provide information to verify that the proposed NO_x for PM_{10} interpollutant offset ratio remains conservative given the changes in approved interpollutant calculations methods and more recent data for the NO_x for PM_{10} interpollutant offset ratio calculation input variables.

Response to Data Request 29: In response to the Staff's data request, the NO_x for PM_{10} interpollutant offset ratio analysis was revised using the methodology and data approved by the District for the SO_x to PM_{10} offset ratio analysis prepared in 2004. This analysis was prepared using CMB modeling results (Bakersfield, Golden State Avenue Monitoring Site) for the period February 2000 through January 2001, and 1999 emissions inventory information, that formed the basis for the District's approved 2003 PM_{10} attainment plan.

The analysis, which is included as Attachment AQ-29, indicates a ratio of 2.16 tons of NO_x to offset 1.0 ton of PM_{10}. As the applicant is proposing to use banked NO_x credits that were achieved at a location greater than 15 miles from the location of their proposed use, the District's NSR rule (Section 4.7.3) requires the application of a distance-offset ratio of 1.5 to be applied to the quantity of offsets required.

The District-approved methodology is to apply these ratios independently to calculate the total interpollutant offset ratio, as follows:

NO_x (lb/yr) = PM_{10} emission increase (lb/yr) + (1.5 – 1.0) x PM_{10} emission increase (lb/yr) + (2.16 – 1.0) x PM_{10} emission increase (lb/yr)

NO_x (lb/yr) = 2.66 x PM_{10} emission increase (lb/yr)

This ratio is slightly lower than the 2.72 to 1 offset ratio that has been proposed for use for the expansion project. Therefore, the proposed NO_x for PM_{10} interpollutant offset ratio of 2.72 to 1 remains conservative.

INITIAL COMMISSIONING EMISSIONS

Background

The applicant has given their estimated emissions during the initial commissioning phase of operation in Appendix B, table B-7. Staff recently analyzed (approved by the Commission on December, 2004) an amendment from the current owners of the existing Pastoria facility (Pastoria Energy Facility, LLC), that approved an increase in hourly commissioning NO_x emissions to 308 lbs/hour and CO hourly emissions to 2,527 lbs/hour. These levels of emissions are greater than the maximum emissions identified during commissioning of the proposed expansion CTG in Table B-7. It should be noted that the turbine model for the expansion CTG (the GE frame 7FA) is identical to the combustion turbines for the present Pastoria project. In order to avoid future variances and/or amendments for the expansion CTG, staff believes that further evaluation of the emissions provided in Table B-7 are necessary.

DATA REQUEST

30. Please provide the technical rationale, including the source(s) of emissions data, that show a maximum of 129.8 lbs/hour for NO_x and 902 lbs/hour for CO in light of the commissioning emissions for the Pastoria Amendment (99-AFC-7) which are identified as 308 lbs/hour for NO_x and 2,527 lbs/hour for CO.

Response to Data Request 30: The applicant has reevaluated the expected commissioning emissions for the expansion CTG and believes that the limits during commissioning should be equivalent to those proposed for the Pastoria Amendment as cited above. The basis for the revised limits is shown in Attachment AQ-30.

31. If the applicant decides to revise their emissions characteristics for commissioning activities, please revise Table 5.2-24 of the AFC and Tables B-7 and B-8 of the Appendix. Also please provide the revised modeling files that would substantiate the revisions to Tables 5.2-24 and Table B-8.

Response to Data Request 31: Revised versions of Tables 5.2-24 and B-8 are provided in Attachment AQ-31, and under separate cover as a CD. The basis for the revised commissioning emissions limits provided in Attachment AQ-30 replaces Table B-7.

Attachment AQ-11

Prop No. 1206-88
July 29, 2005

Calpine Corporation
104 Woodmere Rd.
Folsom, CA 95630

Attention: Mark Steckman (markst@calpine.com)

Reference: Simple Cycle Systems with SCR Catalysts for GE Frame 7FA

Dear Mark:

In reply to your request, we are pleased to confirm that N/E will provide a guarantee for a Simple Cycle System behind a GE 7FA combustion turbine with an outlet NOx of 2.5 ppmvd NOx @ 15% O2 and 10 ppmvd NH3 slip @ 15% O2.

Please do not hesitate to contact Mike, Marty or myself if you have any questions. My phone number is 636-651-1120 and my e-mail address is dgavin@ne.com.

Yours very truly,
Nooter\Eriksen, Inc.

Darla S. Gavin
Sales Manager

cc: Mike Grimm
Marty Nygard

Attachment AQ-25

Attachment AQ-25

Key to Air Quality Modeling Results
Pastoria Energy Facility Expansion Project

Pollutant	Avg. Prd.	Value	Source
Table 5.2-23: ISCST/CTSCREEN Results for Expansion Turbine			
NO_2	1-hr	5.9	Table B-3 of Technical Appendix (Note 1)
	annual	0.3	Table B-3 of Technical Appendix
SO_2	1-hr	1.3	Table B-3 of Technical Appendix
	3-hr	0.9	Table B-3 of Technical Appendix
	24-hr	0.2	Table B-3 of Technical Appendix
	annual	0.06	Table B-3 of Technical Appendix
CO	1-hr	8.6	Table B-3 of Technical Appendix
	8-hr	4.3	Table B-3 of Technical Appendix
$PM_{2.5}/PM_{10}$	24-hr	0.9	Table B-3 of Technical Appendix
	annual	0.2	Table B-3 of Technical Appendix
Table 5.2-23: Startup Results			
NO_2	1-hr	34.7	Table B-3 of Technical Appendix
CO	1-hr	391.0	Table B-3 of Technical Appendix
	8-hr	51.4	Table B-3 of Technical Appendix
Table 5.2-23: Fumigation Results			
NO_2	1-hr	0.6	Table B-5 of Technical Appendix (Note 2)
SO_2	1-hr	0.1	Table B-5 of Technical Appendix
	3-hr	0.1	Table B-5 of Technical Appendix
	24-hr	0.04	Table B-5 of Technical Appendix
CO	1-hr	0.9	Table B-5 of Technical Appendix
	8-hr	0.5	Table B-5 of Technical Appendix
$PM_{2.5}/PM_{10}$	24-hr	0.1	Table B-5 of Technical Appendix

Notes:

1. ISCST3 turbine unit impact screening results for Table B-3 from PSTRSC03.OUT
   CTSCREEN turbine unit impact screening results for Table B-3 from the following files:
   Case 1: PK1_FREC3J.SUM
   Case 2: PK2_FREC3D.SUM
   Case 3: PK3_FREC3J.SUM
   Case 4: PK4_FREC3D.SUM
   Case 5: PK5_FREC3J.SUM
   Case 6: PK6_FREC3D.SUM
2. Modeling results for Table B-5 from SCREEN3 files on enclosed CD. These files were inadvertently omitted from the modeling files that were previously submitted to the CEC.

Pollutant	Avg. Prd.	Value	Source
Table 5.2-24: Commissioning Results			
NO_2	1-hr	81.9	CN1_FREC3E.SUM
CO	1-hr	398.5	CC1_FREC3D.SUM
	8-hr	105.4	PSTRSC08.OUT (SRCGROUP ALL3) times 0.7 to convert 1-hr average to 8-hr average
Table 5.2-26: ISCST3/CTSCREEN Results for Existing Facility + Expansion Turbine			
NO_2	1-hr	59.6	PNOX1FREC3E_B.SUM
	annual	2.4	PSTRSC12.OUT (SRCGROUP TNOXY) times 0.1 to convert 1-hr average to annual average, times 0.75 for ARM
SO_2	1-hr	12.2	PSO21FREC3E_B.SUM
	3-hr	13.1	PSTRSC12.OUT (SRCGROUP TSO23) times 0.9 to convert 1-hr average to 3-hr average
	24-hr	1.8	PSO2DFREC3E.SUM times 0.15 to convert 1-hr average to 24-hr average
	annual	0.4	PSTRSC12.OUT (SRCGROUP TSO2Y) times 0.1 to convert 1-hr average to annual average
CO	1-hr	87.3	PCO_1FREC3E_B.SUM
	8-hr	56.0	PCO_8FREC3D.SUM times 0.5 to convert 1-hr average to 8-hr average
$PM_{2.5}/PM_{10}$	24-hr	4.8	PPM_DFREC3E.SUM times 0.15 to convert 1-hr average to 24-hr average
	annual	2.0	PSTRSC12.OUT (SRCGROUP TPM_Y2) times 0.1 to convert 1-hr average to annual average
Table 5.2-26: Startup Results for Existing Facility + Expansion Turbine			
NO_2	1-hr	204.0	SN1_FREC3E.SUM
CO	1-hr	1946.3	CO1_FREC3E.SUM
	8-hr	268.5	CO8b_FREC3E.SUM times 0.5 to convert 1-hr average to 8-hr average

Pollutant	Avg. Prd.	Value	Source
Table 5.2-27: Maximum Impacts for Existing Facility + Expansion Turbine			
NO_2	1-hr	204.0	1-hour NO_2 startup value from Table 5.2-26
	annual	2.4	annual NO_2 ISCST3/CTSCREEN value from Table 5.2-26
SO_2	1-hr	12.2	1-hr SO_2 ISCST3/CTSCREEN value from Table 5.2-26
	3-hr	13.1	3-hr SO_2 ISCST3/CTSCREEN value from Table 5.2-26
	24-hr	1.8	24-hr SO_2 ISCST3/CTSCREEN value from Table 5.2-26
	annual	0.4	annual SO_2 ISCST3/CTSCREEN value from Table 5.2-26
CO	1-hr	1,946.3	1-hour CO startup value from Table 5.2-26
	8-hr	268.5	8-hour CO startup value from Table 5.2-26
$PM_{2.5}/PM_{10}$	24-hr	4.8	24-hr PM_{10} ISCST3/CTSCREEN value from Table 5.2-26
	annual	2.0	annual PM_{10} ISCST3/CTSCREEN value from Table 5.2-26

Attachment AQ-29

Attachment AQ-29

PM10 Interpollutant Offset Ratio Analysis
Pastoria Energy Facility Expansion Project

PM10

	Notes	Units	Estimate	Uncertainty
"Vegetative Burning" Total	1	$\mu g/m^3$	6.31	2.28
Industry Component (30%)	2	$\mu g/m^3$	1.89	
Regional Background (20%)	3	$\mu g/m^3$	0.38	
Industry minus Background		$\mu g/m^3$	1.51	
County Contribution	4	$\mu g/m^3$	0.76	
Organic Carbon PM10 Inventory - Kern County	5	ton/day	7.90	
County Impact		$\mu g/m^3$ per ton	0.10	0.13

Nitrate

Ammonium Nitrate	6	$\mu g/m^3$	14.90	1.30
Regional Background	7	$\mu g/m^3$	1.00	
Ammonium Nitrate minus Background		$\mu g/m^3$	13.90	
County Contribution	8	$\mu g/m^3$	6.95	
NOx Inventory - Kern County	9	ton/day	156.45	
County Impact		$\mu g/m^3$ per ton	0.04	0.05
Tons of NOx to Equal Effect of 1 ton PM10	10		2.16	2.70

1. Per SJVUAPCD and CARB, PM10 emissions from stationary industrial combustion sources are included in the Vegetative Burning category from Chemical Mass Balance modeling performed for the SJVUAPCD 2003 PM10 Attainment Plan (Bakersfield - Golden State monitoring station).
2. Per SJVUAPCD, 30% of this category is attributed to stationary industrial combustion sources.
3. Per SJVUAPCD, regional background is estimated to be 20% of net concentration after previous adjustment to Vegetative Burning category.
4. Contribution from sources within Kern County is 50% of net concentration after previous adjustments to Vegetative Burning category.
5. Organic carbon PM10 inventory for Kern County that contributes to this monitoring location; from SIP inventory with updates and adjustments based on CCOS study.
6. Ammonium nitrate category from Chemical Mass Balance modeling performed for the SJVUAPCD 2003 PM10 Attainment Plan (Bakersfield - Golden State monitoring station).
7. Per SJVUAPCD, regional background of ammonium nitrate is estimated to be 1 $\mu g/m^3$.
8. Contribution from sources within Kern County is 50% of net concentration after previous adjustment to Vegetative Burning category.
9. 1999 NOx inventory for Kern County that contributes to this monitoring location; from SIP inventory with updates and adjustments based on CCOS study.
10. PM10 County Impact divided by Ammonium Nitrate County Impact.

Attachment AQ-30

Attachment AQ-30

Basis for Proposed Commissioning Limits

Pollutant	Proposed Limit	Basis
Expansion CTG Alone		
NOx	308 lbs/hr	Derived from LMEC permit limit of 616 lbs/hr total for two units during commissioning activities.
	3,200 lbs/day	Based on a review of CEM data during commissioning for Moss Landing units 1-4.
VOC	273 lbs/hr	Based on maximum allowable VOC emissions during startup or shutdown of existing PEF CTGs.
	355 lbs/day	Same as daily emission limit for existing CTGs during days when a startup or shutdown occurs.
CO	2,527 lbs/hr	Derived from LMEC permit limit of 5053.8 lbs/hr total for two units during commissioning activities.
	10,824 lbs/day	Calculated based on 12 hours of uncontrolled emissions at the expansion CTG maximum allowable startup emission rate of 902 lbs/hr.
Expansion CTG plus existing PEF units (for modeling only)		
NOx	359 lbs/hr	Calculated based on one turbine in commissioning at 308 lbs/hr, plus three turbines at base load at 17 lbs/hr each.
	4,550 lbs/day	Calculated based on one turbine in commissioning at 3,200 lbs/day, plus three turbines in normal operation at 450 lbs/day each.
VOC	287.25 lbs/hr	Calculated based on one turbine in commissioning at 273 lbs/hr, plus three turbines in normal operation at 4.75 lbs/hr each.
	1,420 lbs/day	Sum of daily limits for existing and expansion CTGs during days when each turbine experiences a startup or shutdown.
CO	2,602 lbs/hr	Calculated based on one turbine in commissioning at 2,527 lbs/hr, plus three turbines in normal operation at 24.92 lbs/hr.
	17,163 lbs/day	Calculated based on one turbine in commissioning at 10,824 lbs/day, plus three turbines in normal operation at 2,113 lbs/day each.

Attachment AQ-31

Revised Tables 5.2-25 and B-8

TABLE 5.2-24 *REVISED*
MODELED IMPACTS DURING COMMISSIONING OF THE NEW EXPANSION CTG

Pollutant/Averaging Period	Modeled Concentration, µg/m³
NO_x - 1-hour avg	~~81.9~~ *137.4*
CO - 1-hour avg	~~398.5~~ *1,111.4*
CO - 8-hour avg	~~105.4~~ *555.7*

TABLE 5.2-25
MAXIMUM BACKGROUND CONCENTRATIONS, 2002-2004 (µg/m³)

Pollutant	Averaging Time	2001[a]	2002	2003	2004
NO_2	1-hour	--	201.2	159.8	156.0
	Annual	--	39.6	37.7	35.8
SO_2[a]	1-hour	78			
	3-hour	39	n/a	n/a	n/a
	24-hour	13.1			
	Annual	5.3			
CO	1-hour	--	5,625	5,625	4,125
	8-hour	--	2,778	3,400	2,667
PM_{10}	24-hour	--	100	110	95
	Annual	--	49	48	44
$PM_{2.5}$	24-hour[b]	--	73	59	62
	Annual	--	22.8	16.8	15.5

a. No SO_2 data were collected in Kern County in 2002 or 2003.
b. $PM_{2.5}$ 24-hr average concentrations shown are 98th percentile values rather than highest values because compliance with the standard is based on 98th percentile readings.

Maximum ground-level impacts due to operation of the new turbine in combination with the existing PEF equipment are shown in Table 5.2-26. The startup modeling assumes that the new expansion CTG starts up simultaneously with the startup of one of the existing combined-cycle CTGs.

These maximum modeled concentrations are combined with background ambient concentrations and compared with the state and federal ambient air quality standards in Table 5.2-27. Using the conservative assumptions described earlier, the results indicate that the PEF Expansion project will not cause or contribute to violations of any state or federal air quality standards, with the exception of the state and federal PM_{10} and $PM_{2.5}$ standards. For these pollutants, existing concentrations already exceed the state and federal standards.

Table B-8
PEF Expansion Project
Modeled Impacts During Commissioning of Expansion CTG
Revised August 2005

	Stack Diam, m	Stack Height, m	Exh Temp, Deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s		
						NOx	CO 1-hr	CO 8-hr
Expansion CTG	6.93	39.93	656.9	1085.9	28.755	*38.808*	*318.402*	*318.402*
Turbine 1/HRSG	5.49	45.72	362.3	495.8	20.971	2.146	3.140	3.140
Turbine 2/HRSG	5.49	45.72	362.3	495.8	20.971	2.146	3.140	3.140
Turbine 3/HRSG	5.49	45.72	362.3	495.8	20.971	2.146	3.140	3.140

Assume expansion CTG in commissioning and three existing CTGs at full load.

TECHNICAL AREA: HAZARDOUS MATERIALS MANAGEMENT
AUTHOR: ALVIN GREENBERG, PH.D.

BACKGROUND

Table 3.4.10-1 of the AFC lists the chemicals used for water treatment, none of which have changed as a result of this expansion. However, several chemicals are not identified, such as "Oxygen scavenger 30%," "Scale inhibitor," and "Polymer." In order to conduct an assessment of the risks posed to the public due to the transportation, storage, and use of hazardous materials, staff needs the identity of all chemicals proposed for use on the site. Additionally, no information has been provided about the increase in deliveries of anhydrous ammonia with this expansion. Anhydrous ammonia is classified and regulated as an acutely hazardous material and the increase in deliveries must be known before staff can assess the risk to the public due to an increase in deliveries.

39. No information has been provided about the increase in deliveries of anhydrous ammonia with this expansion. Please provide an estimate of how many truck deliveries of anhydrous ammonia will occur per year, taking into account the deliveries required for the existing PEF, and the proposed Expansion facility.

Response to Data Request 39: Using conservative assumptions for operating profiles, the existing PEF is estimated to require up to 24 truck deliveries per year of ammonia. The proposed PEF Expansion is estimated to require between 1 and 2 additional deliveries per year.

TECHNICAL AREA: PUBLIC HEALTH
AUTHOR: ALVIN GREENBERG, PH.D.

BACKGROUND

The Public Health section of the Application for Certification did not include the additional cooling tower emissions caused by the expansion.

DATA REQUEST

40. The Health Risk Assessment does not include cooling tower emissions. Please provide these emission factors.

Response to Data Request 40: As stated in the AFC Section 5.2.5.1.1 (p. 5.2-28), the existing four-cell cooling tower at the Pastoria Energy Facility has adequate capacity to provide cooling water needed for the PEF Expansion CTG without requiring an increase in maximum water circulation rate above the 74,000 gpm rate that was the basis for the existing cooling tower permit. Therefore, there will be no increase in emissions of either criteria or noncriteria pollutant emissions as a result of the proposed PEF Expansion project.

The requested emission factors are provided in Attachment PH-40.

Attachment PH-40

Attachment PH-40

Calculation of Hazardous Air Pollutant Emissions from Cooling Towers
Pastoria Expansion Project

Cooling Tower Design Parameters		
	Four-Cell Tower	Eight-Cell Tower
Water Flow Rate, 10E6 lbm/hr	36.99	73.47
Water Flow Rate, gal/min	74,000	147,000
Drift Rate, %	0.0005	0.0005
Drift, lbm water/hr	184.93	367.35

HAP Emissions from Four-Cell Cooling Tower (1)				
Constituent	Concentration in Cooling Tower Return Water (2)	Emissions, lb/hr	Emissions, lb/day	Emissions, ton/yr
Arsenic	10 ppb	1.85E-06	4.44E-05	1.62E-02
Chromium VI (3)	0 ppb	0.00E+00	0.00E+00	0
Copper	20 ppb	3.70E-06	8.88E-05	3.24E-02
Fluorides	500 ppb	9.25E-05	2.22E-03	0.81
Lead (4)	5 ppb	9.25E-07	2.22E-05	8.10E-03
Manganese (4)	25 ppb	4.62E-06	1.11E-04	4.05E-02
Selenium (4)	5 ppb	9.25E-07	2.22E-05	8.10E-03
Zinc	25 ppb	4.62E-06	1.11E-04	4.05E-02

HAP Emissions from Eight-Cell Cooling Tower (5)				
Constituent	Concentration in Cooling Tower Return Water (2)	Emissions, lb/hr	Emissions, lb/day	Emissions, ton/yr
Arsenic	10 ppb	3.67E-06	8.82E-05	3.22E-02
Chromium VI (3)	0 ppb	0.00E+00	0.00E+00	0
Copper	20 ppb	7.35E-06	1.76E-04	6.44E-02
Fluorides	500 ppb	1.84E-04	4.41E-03	1.61
Lead (4)	5 ppb	1.84E-06	4.41E-05	1.61E-02
Manganese (4)	25 ppb	9.18E-06	2.20E-04	8.05E-02
Selenium (4)	5 ppb	1.84E-06	4.41E-05	1.61E-02
Zinc	25 ppb	9.18E-06	2.20E-04	8.05E-02

Notes:
(1) Emissions calculated from maximum drift rate of 184.93 lb/hr
(2) Mean value from Table 3.4.8-2 of the AFC with 10 cycles of concentration.
(3) Permit prohibits use of chromium VI-containing compounds in cooling towers.
(4) Concentrations shown in analysis as "<" were included at 1/2 the value shown in the AFC table.
(5) Emissions calculated from maximum drift rate of 367.35 lb/hr

TECHNICAL AREA: SOIL AND WATER RESOURCES
AUTHOR: LINDA D. BOND

BACKGROUND

The Application for Certification, page 3-3 states the following:

"Stormwater will be discharged to the existing PEF onsite stormwater detention pond. Stormwater that does not infiltrate into the soils or evaporate will be discharged to Pastoria Creek in accordance with applicable regulations and in coordination with Tejon Ranch." The AFC did not provide recent chemical characteristics of the groundwater and Pastoria Creek at or near the site. This information is required under the California Energy Commission Power Plant Site Certification Regulations. This data establishes the baseline against which any future contamination from discharges would be measured.

DATA REQUEST

42. Please provide a description of the chemical characteristics of the groundwater.

REVISED Response to Data Request 42: The chemical characteristics of the groundwater in the vicinity of the existing Pastoria Energy Facility are included in the fax transmittal from the Wheeler Ridge-Maricopa Water Storage District dated June 21, 2005. This transmittal includes a map showing the location of Monitoring Well #1 (MW1), a cross section showing the geology and groundwater conditions in the vicinity of the existing Pastoria Energy Facility, and a table denoting the chemical characteristics of groundwater samples taken in December 2002 and January 2003. A copy of the fax transmittal was provided as Attachment SOIWR-42 in the Data Responses submitted by the applicant on July 22, 2005.

A map confirming the location of the cross section view line for the two previously submitted cross sections displaying the geology and groundwater conditions is provided in this Data Response Package as Attachment SOIWR-42a.

BACKGROUND

The Application for Certification, page 3-3 states the following: "Stormwater that does not infiltrate into the soils or evaporate will be discharged to Pastoria Creek in accordance with applicable regulations and in coordination with Tejon Ranch." Since the proposed project will add to the site's impervious surface area the amount of soil available to absorb stormwater will be reduced which staff assumes could lead to an incremental increase in levels of stormwater flowing to Pastoria Creek. The report, Flood Inundation Study for the Pastoria Energy Facility (URS, September 6, 2001), which was submitted by the Applicant with the Supplement to AFC (6/13/2005), noted several assumptions describing the characteristics of water flows that would exit the project site during flood events. However, neither the current

AFC nor the report addressed the effects of the expansion project on the flood flows downstream of the project.

DATA REQUEST

44. Please provide a description that specifically addresses the incremental effect of the expansion project on flood flows that are diverted around the project and that exit the project. The description should include a discussion of how the project would affect flow velocities, sediment deposition and sediment scour around the project and downstream of the project compared to pre-expansion project conditions.

REVISED Response to Data Request 44: The area where the Pastoria Energy Facility Expansion (PEFE) will be constructed is completely within the existing Pastoria Energy Facility (PEF). General facility drainage (including the PEFE area) is directed to the storm water retention pond in the northwest corner of the property. There is only one storm water discharge point for the PEF, which is located on the west side of the storm water pond. The storm water pond is designed to contain the flow of a 25-year storm event. In the event that enough storm water would accumulate to have a discharge, storm water would overflow the pond at the designed overflow point to a spillway, which eventually leads to Pastoria Creek, an ephemeral creek located approximately 1,000 feet to the northwest.

The storm water system for the existing PEF was designed assuming the PEFE area (or drainage shed) would eventually include another combustion turbine unit similar to the existing units. Each drainage-shed within the existing PEF was designed based on an infiltration coefficient of 0.92. The infiltration or runoff coefficient is a measure of how much storm water is absorbed by the ground surface – e.g., a coefficient of 0.0 means all storm water is absorbed into the ground; a coefficient of 1.0 means none of the storm water is absorbed. The PEF runoff coefficient of 0.92 takes into consideration that some areas within the drainage shed are impervious (runoff coefficient of 1.0) and some areas are surfaced with gravel, with a somewhat lower runoff coefficient. When the PEFE is designed, the area will be designed to maintain the site average of 0.92 or lower. Thus, since the runoff coefficient for PEFE area will be maintained at or below the existing PEF coefficient, there will be no incremental increase in storm water runoff into the storm water retention pond, and thus, no incremental increase in storm water pond overflow discharges leading to Pastoria Creek. Therefore, the PEFE will have no incremental effects on flood flows, flood flow velocities, sediment deposition or sediment scour.

Attachment SOIWR-42a

WHEELER RIDGE-MARICOPA
WATER STORAGE DISTRICT
12109 Highway 166 * Bakersfield, CA 93313-9630 * Phone: (661) 858-2281 * Fax (661) 858-2643

▸ FAX TRANSMITTAL ◂

TO: Jennifer Scholl, URS

FAX NO. (805) 964-0259

FROM: Tom Suggs

☐ Original will follow

DATE: 8/11/05

☒ Original will not follow

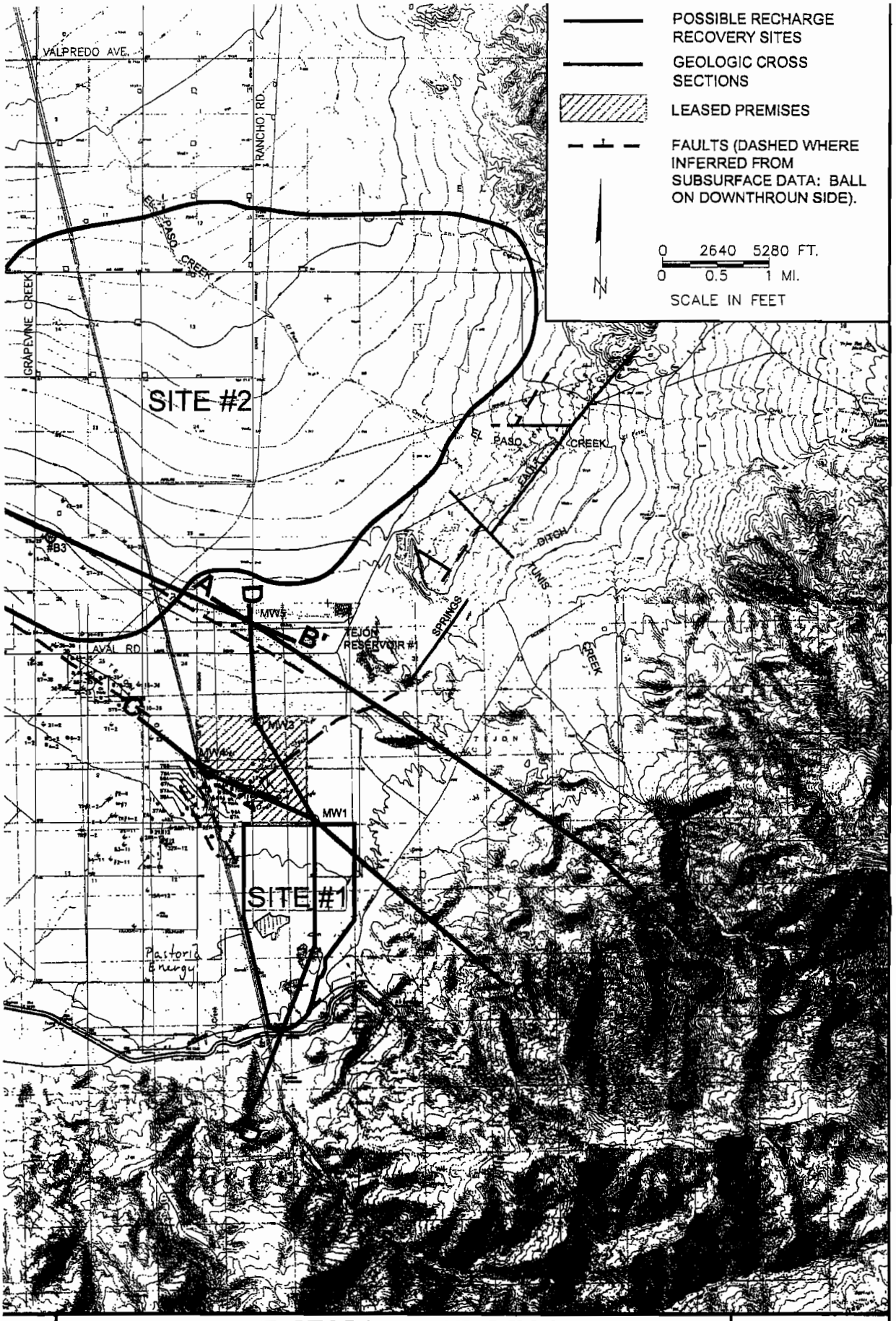
NUMBER OF PAGES 2 (INCLUDING THIS PAGE)

MESSAGE:

Following is a location map for geologic cross section D-D' on legal size paper. I hope this serves your purposes. The map is a little busy. I could perhaps generate a cleaned up version, but it would require a day or two.

TRS

P.S.: The water chemistry that I ~~sent~~ previously transmitted was from the well labled MW1 on this map.



GROUNDWATER STORAGE AND RECOVERY PILOT PROJECT IN WHITE WOLF BASIN LOCATION MAP

MAY 2004

FIGURE 1

114554

TECHNICAL AREA: TRANSMISSION SYSTEM ENGINEERING
AUTHOR: SUDATH ARACHCHIGE AND MARK HESTERS

BACKGROUND

Staff needs to completely identify downstream transmission facilities required for the interconnection of the new project. Staff requires a completed Facility Study by Southern California Edison that identifies electric system impacts of the project and discusses mitigation measures considered and those proposed to maintain conformance with National Energy Regulatory Commission (NERC), Western Systems Coordinating Council (WSCC) and California Integrated System Operator (Cal-ISO) reliability or planning criteria. Any significant electric facilities identified by this study will require environmental analysis.

DATA REQUEST

45. Please provide a signed copy of the Facility Study Agreement with Southern California Edison and indicate in a schedule when the Facility Study will be completed.

Response to Data Request 45: The applicant will docket copies of the Facility Study Agreement to the CEC once it has been received from Southern California Edison.

46. Please provide a complete Facility Study. This study should demonstrate conformance with NERC, WSCC and Cal-ISO reliability or planning criteria based on load flow, post transient, transient and fault current studies. Where mitigation is required to ensure compliance with the previously mentioned criteria, provide the alternatives considered and the reasons for choosing a preferred alternative.

Response to Data Request 46: The applicant will docket copies of the Facility Study to the CEC once it has been received from Southern California Edison.

47. Please submit an Environmental Assessment for Transmission Line Upgrades and Mitigations.

Response to Data Request 47: The applicant will docket copies of the Environmental Assessment for Transmission Line Upgrades and Mitigations once the EA is completed and ready for submittal.

48. Please submit the letters of approval (preliminary and final) from the CAISO for interconnection of the new unit.

Response to Data Request 48: The applicant will docket copies of the letters of approval from the CAISO for the interconnection of the new unit to the CEC once it has been received from Southern California Edison.

SUPPLEMENTAL INFORMATION TO ADDRESS QUESTIONS FROM THE CEC ISSUES WORKSHOP ON JULY 26, 2005:

Separate Permits

As discussed at the July 26 workshop, Calpine is requesting that, to the extent practicable, the Commission maintain separate conditions for the expansion unit from those imposed on the existing three units. There are several reasons for this request.

First, the San Joaquin Valley APCD (SJVAPCD) establishes separate, redundant sets of permit conditions for each item of equipment at the site. Thus, if the CEC maintains separate conditions for the expansion unit from those imposed on the three existing units, the CEC conditions will be identical to those established by the SJVAPCD.

Second, Calpine will finance construction of the expansion unit separately from the financing for the three existing units. It has been Calpine's experience that lenders will insist that there be no restrictions on operation of a unit that they finance caused by the operations of other units that they have not financed and have no control over. By keeping these requirements separate during licensing, Calpine will avoid the potential need to seek amendments to the Commission's conditions at a later date.

Finally, to the extent that there are conditions for which separation of the units is impossible or impracticable, Calpine will work with the Commission staff and the SJVAPCD to establish appropriate conditions.

Pastoria Creek/Runoff Issues

See Revised Response to Data Request #44.

STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

In the Matter of:	)	
	)	Docket No. 05-AFC-1
Application for Certification for the Pastoria Energy Facility (PEF) 160 MW Expansion by Calpine Corporation	)	

PROOF OF SERVICE

I, Ron O'Connor, declare that on August 12, 2005, I deposited copies of the attached *Pastoria Energy Facility 160 MW Expansion Data Request Package No. 2* in the United States mail in Sacramento, California, with first-class postage thereon fully prepaid and addressed to all parties on the attached service list.

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

Deric Wittenborn

SERVICE LIST
05-AFC-1

Andrew Whittome, Project Mgr.
Pastoria Expansion
Calpine Corporation
4160 Dublin Blvd.
Dublin, CA 94568

Rick Thomas, Director
Project Development
Calpine Corporation
4160 Dublin Blvd.
Dublin, CA 94568

Rick Tetzloff
Project Engineer
Calpine Corporation
700 NE Multnomah, Suite 870
Portland, OR 97232

Jennifer Scholl
URS Corporation
130 Robin Hill Road, Suite 100
Goleta, CA 93117

Nancy Matthews
Sierra Research
1801 J Street
Sacramento, CA 95814

Thomas Goff, Permit Services Agency
San Joaquin Valley Unified APCD
2700 M Street
Bakersfield, CA 93301

Donna Jordan
CA Independent System Operator
151 Blue Ravine Road
Folsom, CA 95630

Robert J. Kunde
Wheeler Ridge-Maricopa
Water Storage District
Post Office Box 9429
Bakersfield, CA 93389-9429