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File No. 030137-0024

February 3, 2010

VIA FEDEX

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-11
1516 Ninth Street, MS-4
Sacramento, California 95814-5512

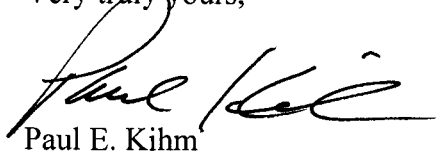
Re: CPV Vaca Station Power Plant Project: Docket No. 08-AFC-11

Dear Sir/Madam:

Pursuant to California Code of Regulations, title 20, sections 1209, 1209.5, and 1210, enclosed herewith for filing please find a letter from Steve Hill to Gerardo Rios enclosing the Supplement to PSD Full Impact Analysis.

Please note that the enclosed submittal was filed today via electronic mail to your attention and served on all parties to the above-referenced project.

Very truly yours,



Paul E. Kihm
Senior Paralegal

Enclosure

cc: 08-AFC-11 Proof of Service List (w/encl., via e-mail and U.S. Mail)
Michael J. Carroll, Esq. (w/encl.)
Marc T. Campopiano, Esq. (w/encl.)

February 3, 2010

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Mr. Gerardo Rios
Chief, Permits Office
USEPA Region IX
75 Hawthorne Street
San Francisco, CA 94105

Subject: CPV Vaca Station
Supplement to PSD Full Impact Analysis

Dear Mr. Rios:

At a meeting between the applicant (CPV Vaca Station) and EPA on July 29, 2009, EPA provided additional guidance concerning the CPV Vaca Station PSD permit application. The purpose of this letter is to provide the supplement to the full impact analysis requested by EPA staff at that meeting.

Background

EPA's incomplete letter (July 23, 2009) referred to recent EPA actions to reconsider aspects of the $PM_{2.5}$ NSR Implementation Rule (73 FR 28321 May 31, 2008) (specifically, the Administrator's decision to stay the grandfathering provisions for $PM_{2.5}$). As we discussed at our meeting on July 29, the recent EPA action did not affect our project, because the project was not subject to the grandfathering provision.

In the course of the meeting, EPA clarified its comment as having two goals: first, to alert us to the fact that YSAQMD's attainment status with regard to $PM_{2.5}$ might change during the period that the PSD application was being reviewed; and second, to notify us that a full impact analysis for $PM_{2.5}$ was required.

At the meeting, EPA staff members indicated that they expected to see an air quality analysis that includes dispersion modeling of nearby stationary sources that might affect the project's impact area. The basis for this expectation is the analytical methodology described in the 1990 draft NSR Workshop Manual.

Discussion

As discussed at the July meeting, the full impact analysis previously submitted to EPA was conducted in accordance with the modeling protocol submitted for EPA's review on

May 12, 2008. Under the protocol, we indicated that existing local concentrations would be characterized by monitoring data from nearby monitors. EPA did not offer comment on the protocol at that time.

As discussed in the attached analysis, EPA's policy to use PM_{10} compliance as a surrogate for $PM_{2.5}$ compliance under PSD is still in effect.

Because the full impact analysis previously submitted was performed in accordance with a protocol reviewed by EPA, and because compliance was demonstrated in accordance with the requirements and guidelines currently applicable to such projects, we believe EPA's request is for an analysis supplemental to PSD requirements.

As requested by EPA staff, a supplemental analysis of the CPV Vaca Station project has been performed. This analysis explicitly evaluates $PM_{2.5}$ impacts from the project. Local background concentrations were calculated by adding the modeled impacts from two nearby stationary sources (California Medical Facility and Easterly Wastewater Treatment Facility) to the regional background concentration. Davis ambient monitoring data were used to represent regional background concentrations.

Conclusion

The supplemental analysis of $PM_{2.5}$ impacts is attached. The analysis demonstrates that the project will not cause or contribute significantly to a violation of a national ambient air quality standard for this pollutant.

Please let us know if there is anything we can do to expedite your review.

Sincerely,

Steve Hill

cc: Andy Welch, CPV Vaca Station
Mike Carroll, Latham & Watkins
Susan McLaughlin, YSAQMD
CEC Dockets Office (08-AFC-11)

Attachment: Supplemental $PM_{2.5}$ Impact Analysis

Supplemental $PM_{2.5}$ Impact Analysis
CPV Vaca Station
February 2010

The purpose of the PSD Air Quality Impact Analysis is to determine whether the project has the potential to cause or contribute to an exceedance of federal ambient air quality standards.[1] A project causes or contributes to an exceedance if the project impact is above the Significant Impact Level (SIL) *and* the combined impact of the project plus background is above the ambient air quality standard.[2]

On July 18, 1997, EPA established National Ambient Air Quality Standards for $PM_{2.5}$.[3] Also in 1997, EPA issued guidance for regulating $PM_{2.5}$ under PSD during the interim period between promulgation of ambient air quality standards and promulgation of PSD rules implementing the $PM_{2.5}$ program.[4] As noted in that guidance, Section 165 of the Act suggests that PSD requirements become effective for a new NAAQS upon the effective date of the NAAQS. EPA recognized that, without implementing regulations, review of $PM_{2.5}$ impacts under PSD would be inconsistent and subject to considerable controversy. As a result, EPA adopted an interim policy (the "surrogate" policy). The 1997 guidance stated that sources would be allowed to use implementation of a PM_{10} program as a surrogate for meeting $PM_{2.5}$ NSR requirements (including PSD) until certain difficulties were resolved, primarily the lack of necessary tools to calculate the emissions of $PM_{2.5}$ and related precursors, the lack of adequate modeling techniques to predict ambient impacts, and the lack of $PM_{2.5}$ monitoring sites.

On November 1, 2005, EPA proposed regulations to implement the NSR program for $PM_{2.5}$, including PSD.[5] In the preamble to the proposal, EPA indicated that the difficulties that necessitated the surrogate policy had been resolved in most respects, and where they had not been, the proposal contained appropriate provisions to account for them. EPA also indicated that the SILs for $PM_{2.5}$ would be developed in a parallel rulemaking process.[6]

On April 25, 2007, EPA promulgated the $PM_{2.5}$ implementation rules that had been proposed in 2005.[7] The April 25, 2007 promulgation indicated that, contrary to statements made in the preamble to the 2005 proposal, technical issues regarding source test methodologies remained unresolved.[8] EPA agreed with commenters "that a transition period should be allowed to allow time to resolve and adopt appropriate testing procedures for condensable PM emissions, to collect total (filterable and condensable)

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[1] Section 165(a)(3) of the CAA; 40 CFR 51.166(k) and 52.21(k).
[2] New Source Review Workshop Manual (Draft) 1990, p. C-51
[3] 62 FR 38652; the 24-hour standard was subsequently strengthened in October 2006 from 65 $\mu g/m^3$ to 35 $\mu g/m^3$
[4] ''Interim Implementation for the New Source Review Requirements for PM2.5,'' John Seitz, EPA, October 23, 1997
[5] 70 FR 65983
[6] 70 FR 66040
[7] 72 FR 20585
[8] 72 FR 20652

$PM_{2.5}$ emissions data that are more representative of the sources in their areas, and develop effective regulations for control of direct $PM_{2.5}$, including condensable PM."[9] The need for further review of test methods was discussed in the context of SIP revisions. The question of whether extension of the surrogate policy was needed for PSD purposes was not discussed.

On September 21, 2007, EPA proposed values for the $PM_{2.5}$ SIL (annual impact) ranging from 1.2 to 5 $\mu g/m^3$; at the same time, EPA proposed values for the $PM_{2.5}$ SIL (24-hour average impact) ranging from 4 to 5 $\mu g/m^3$.[10] As part of the proposal, EPA provided guidance on how $PM_{2.5}$ would be addressed under NSR programs prior to adoption of the $PM_{2.5}$ thresholds, answering the question left unanswered in its April 25, 2007 final rulemaking:

> *Following final action on this proposal* and the $PM_{2.5}$ implementation rule for NSR, the Federal $PM_{2.5}$ NSR programs will no longer have to rely on the PM_{10} program as a surrogate, as has been the practice under our existing guidance. A State implementing a NSR program in an EPA approved State Implementation Plan (SIP) may continue to rely on the interim surrogate policy until we approve a revised SIP addressing these requirements.[11] [emphasis added]

On May 31, 2008, EPA adopted revisions[12] to the PSD program that, among other things, codified the interim surrogate policy[13] with respect to sources constructed prior to July 15, 2008, and articulated EPA's intention to continue the use of the PM_{10} program as a surrogate for $PM_{2.5}$ compliance until $PM_{2.5}$ thresholds had been finalized:

> "This final action on the bulk of the major NSR program for $PM_{2.5}$ along with our proposed rule on increments, SILs, and SMC, when final, will represent the final elements necessary to implement a $PM_{2.5}$ PSD program. *When both rules are promulgated and in effect*, the $PM_{2.5}$ PSD program will no longer use a PM_{10} program as a surrogate, as has been the practice under our existing guidance."[14] [emphasis added]

On June 1, 2009, in response to a petition from Earthjustice, the Administrator issued an administrative stay of the provision of the May 31, 2008 rulemaking that codified the interim surrogate policy (the "grandfathering" provision). The stay was effective until September 1, 2009. On September 22, 2009, EPA issued a final rule staying the "grandfathering" provision until June 22, 2010. In neither action did EPA rescind or replace the 1997 surrogate policy.

The effect of the stay was to render the "grandfathering" provision ineffective. The stay had no effect on other provisions of the rule. The stay did not address or affect existing

[9] 72 FR 20655
[10] 72 FR 54112
[11] 72 FR 54114
[12] 73 FR 28321
[13] 40 CFR 52.21(b)(50)(vi)(i)(1)(xi)
[14] 73 FR 28324

EPA policy or guidance. As clearly articulated in the May 31, 2008 rulemaking, the existing guidance was that the surrogate policy continued to be in effect.

In summary: shortly after promulgating $PM_{2.5}$ ambient air quality standards, EPA established a policy to use compliance with the PM_{10} PSD analysis as a surrogate for the $PM_{2.5}$ requirement. In subsequent rulemakings, EPA has indicated its intent to end the surrogate policy once regulations implementing the $PM_{2.5}$ program had been promulgated. In 2005, EPA indicated that the implementing regulations would accomplish this. In 2007, EPA indicated that the implementing regulations alone were not sufficient, and that the surrogate policy remained in effect until the regulations identifying thresholds were finalized. In 2008, EPA promulgated a regulation that incorporated a "safe harbor" for permits submitted by a specific date; in 2009, EPA stayed the safe harbor provision, but did not rescind or revise the surrogate policy. The most recent notice addressing the surrogate policy in the Federal Register indicates that the policy will continue to be in effect until the regulation implementing thresholds has been promulgated. The surrogate policy therefore continues to be in effect.

The PSD permit application for this project includes a $PM_{2.5}$ impact analysis prepared in accordance with current EPA policy, using PM_{10} impacts as a surrogate for $PM_{2.5}$. EPA has requested that an additional $PM_{2.5}$ impact analysis (separate from the surrogate analysis) be prepared for this project. The requested analysis is presented below.

Preliminary Impact Analysis

A preliminary impact analysis is a screening process that determines whether additional analysis is required. Conservative simplifying assumptions are made. If the project impacts are below the thresholds using these assumptions, then no further analysis is required.

The preliminary impact analysis conducted for this project is described in the initial PSD application.[15] The preliminary analysis showed project impacts below the PSD SILs for all pollutants and averaging times except for those listed in Table 1, below. Because the project impacts for the pollutants and averaging times not listed in Table 1 are below their respective SILs, it is not possible for the project to cause or contribute to an exceedance of the respective ambient standards. For this reason, EPA does not require additional analysis for pollutants and averaging times not listed in Table 1.

[15] PSD Application, Page 5.1-40

Table 1 Project Impacts Above SIL (Initial PSD Application) CPV Vaca Station			
Pollutant	Averaging Time	SIL ($\mu g/m^3$)	Maximum Modeled Impact ($\mu g/m^3$)
NO_2	Annual	1	2.3
PM_{10}	Annual	1	3.6
PM_{10}	24-hour	5	14.7
$PM_{2.5}$	Annual	1[16]	2.2
$PM_{2.5}$	24-hour	5[16]	7.5

Subsequent to submittal of the initial PSD application, changes were made to the cooling tower design for the project. These changes resulted in lower PM emissions from the project, and revised impacts for other pollutants (changes in the cooling tower's physical dimensions affected dispersion characteristics (i.e., downwash) from other emission points). New modeling has been performed to determine revised project impacts. Details of the revised modeling parameters are presented in Appendix 1. The results of the revised modeling analysis are summarized in Table 2, which lists all pollutants and averaging times where project impacts equal or exceed the SIL.

Table 2 Project Impacts At or Above SIL (Revised Cooling Tower Design) CPV Vaca Station			
Pollutant	Averaging Time	SIL ($\mu g/m^3$)	Maximum Modeled Impact ($\mu g/m^3$)
NO_2	Annual	1	1.3
PM_{10}	Annual	1	3.2
PM_{10}	24-hour	5	7.7
$PM_{2.5}$	Annual	1[17]	1.8
$PM_{2.5}$	24-hour	5[17]	6.4

Full Impact Analysis

Background

A full impact analysis is required for those pollutants with a modeled impact that equals or exceeds the SIL.[18] The full impact analysis requires determination of impacts over all averaging times for which a federal ambient air quality standard exists, even if the SIL for that averaging time was not exceeded in the preliminary analysis.

[16] Proposed (Option 1) (see 72 FR 54146, Option 1)
[17] Proposed (Option 1) (see 72 FR 54146, Option 1)
[18] New Source Review Workshop Manual (Draft) 1990, p. C-26

The full impact analysis expands the preliminary analysis to consider the impacts of emissions from residential, commercial, and industrial growth that accompanies the new activity at the project. It also considers emissions from existing sources.

The full impact analysis is used to predict ambient concentrations resulting from both existing sources and the project's direct and indirect emissions for comparison with the applicable ambient air quality standards and PSD increments.

A full impact analysis was also included in the PSD application. The analysis was prepared following the procedures that were described in the modeling protocol that was submitted to EPA on May 12, 2008, for review and comment. EPA did not provide any comments on the protocol.

As proposed in the protocol, and as reviewed by EPA without comment, the emissions from existing sources were to be characterized by ambient monitoring data at nearby monitoring sites.[19] This is the typical procedure for conducting impact analyses for projects in Region 9.

The protocol also proposed to use the PM_{10} analysis as a surrogate for $PM_{2.5}$ impacts, following EPA's guidance.[20] As discussed above, EPA's most recent public notice regarding the surrogate policy is that it still applies, and will continue to apply until $PM_{2.5}$ SILs have been promulgated.

The results of the full impact analysis are summarized in Table 3.

Table 3
Maximum Project Impacts (Revised Cooling Tower Design) Plus Background
CPV Vaca Station

Pollutant	Averaging Time	Maximum Project Impact[a] ($\mu g/m^3$)	Background ($\mu g/m^3$)	Project Plus Background ($\mu g/m^3$)	Ambient Air Quality Standard ($\mu g/m^3$)
NO_2	Annual	1.3	16	17.3	100
PM_{10}	Annual	3.2	18.2	21.4	n/a
PM_{10}	24-hour	7.7	60	67.7	150

[a] Conservatively assuming that the cooling tower PM is all PM_{10}.

The sum of the maximum project impact and the highest measured background impact is well below the ambient air quality standard for all pollutants and averaging times. As a result, the project does not cause or contribute to an exceedance of the NO_2 and PM_{10} ambient air quality standards. Under the surrogate policy, compliance with PM_{10} limits means that $PM_{2.5}$ impacts are also acceptable.

[19] Air Dispersion Modeling and Health Risk Assessment Protocol, CPV Vacaville Project (May 2008), p. 15.
[20] 72 FR 54114

EPA's Request for a Supplement to the Full Impact Analysis

At a meeting on July 30, 2009, EPA staff requested that the full impact analysis in the PSD application be supplemented in two ways:

- $PM_{2.5}$ impacts should be explicitly evaluated.
- Nearby sources large enough to potentially affect the impact area should be included in the model, and their impacts added to the ambient background concentrations measured by the monitoring stations.

The supplement to the full impact analysis is presented below.

Impact Area

The proposed project's impact area is the geographical area for which the required air quality analyses for the NAAQS and PSD increments are carried out. The impact area is a circular area with a radius extending from the source to (1) the most distant point where approved dispersion modeling predicts a significant ambient impact will occur, or (2) a modeling receptor distance of 50 km, whichever is less.[21] The areas where project impacts exceed the SILs, and the corresponding impact areas, are shown in Figures 1-3.

[21] New Source Review Workshop Manual (Draft) 1990, p. C-26

Figure 1
CPV Vaca Station Project Impacts (NO_2, annual average, µg/m^3)

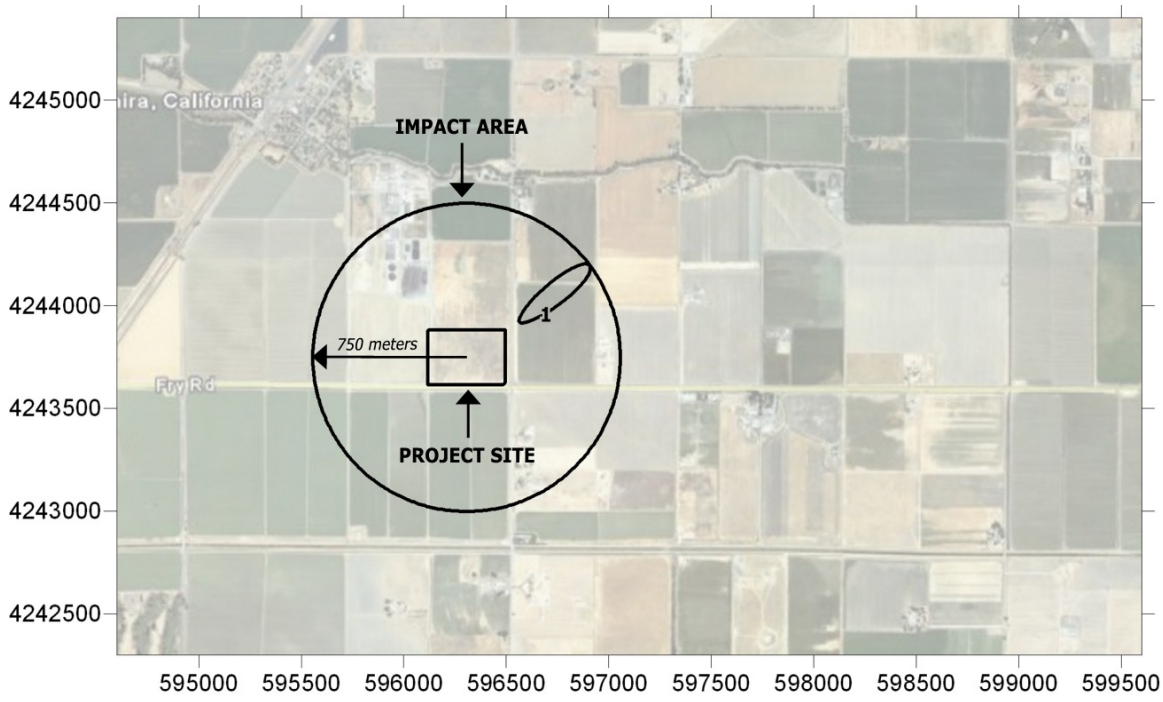


Figure 2
CPV Vaca Station Project Impacts ($PM_{10}/PM_{2.5}$, annual average, µg/m^3)

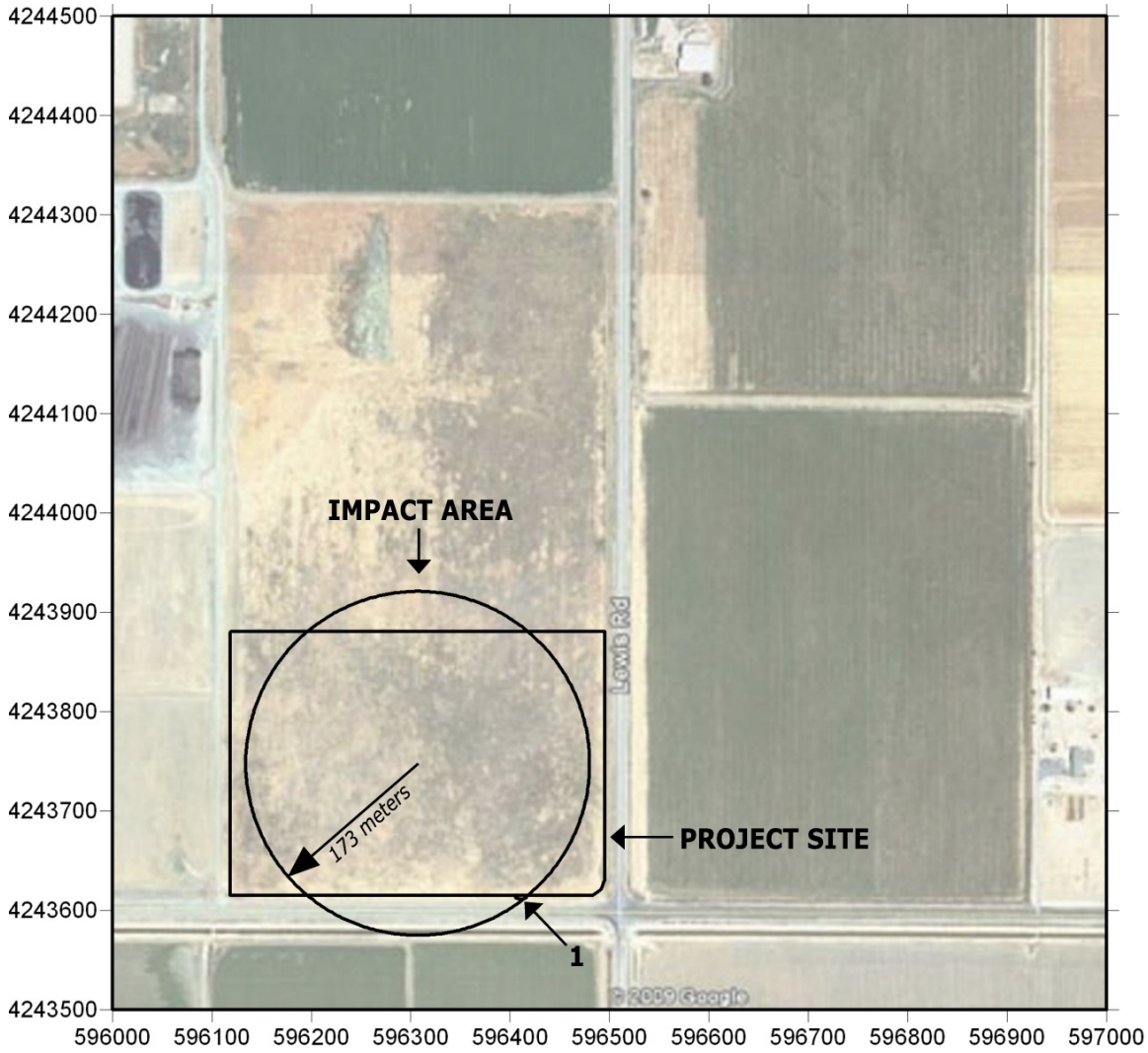
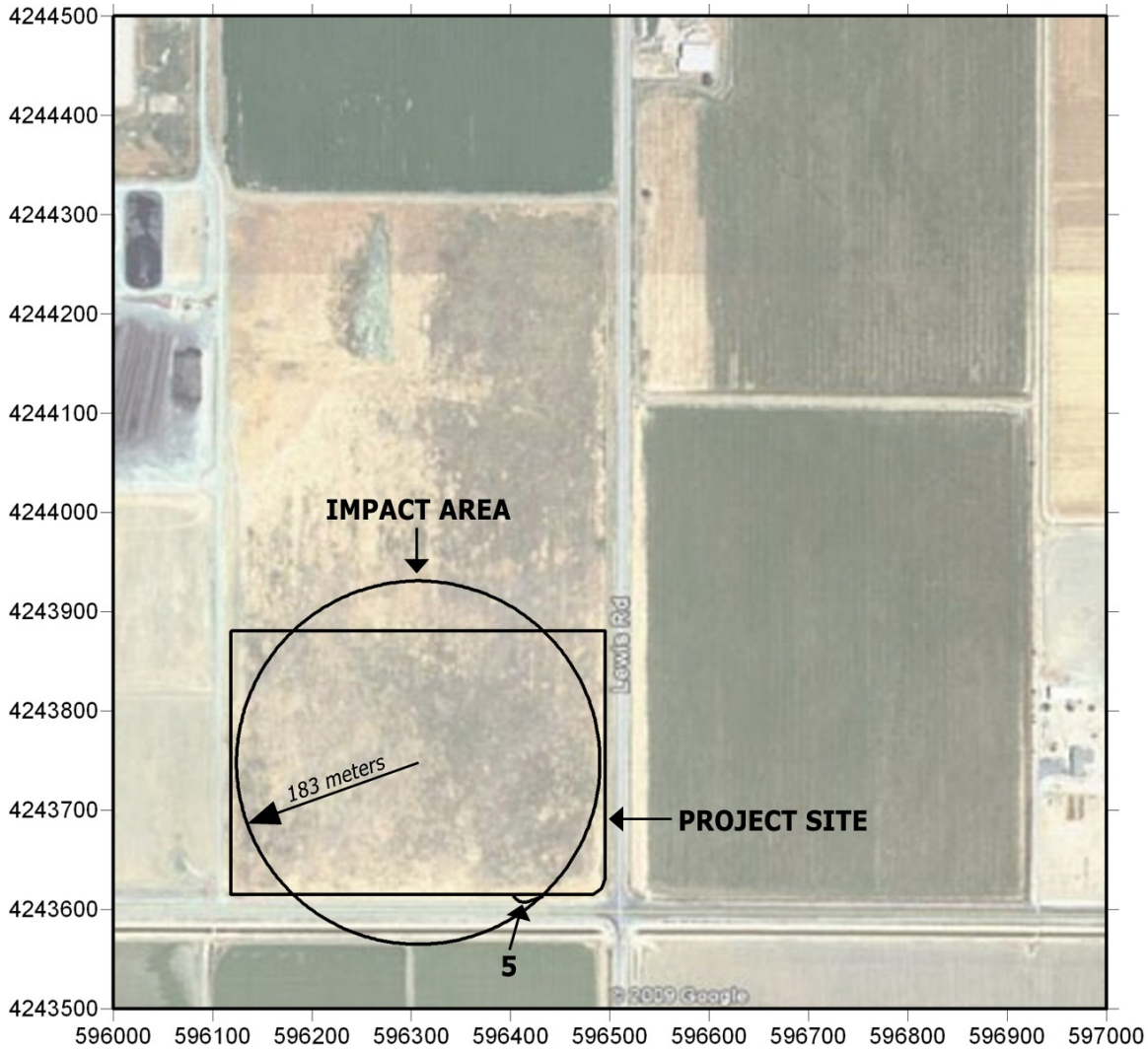


Figure 3
CPV Vaca Station Project Impacts ($PM_{10}/PM_{2.5}$, 24-hour average, µg/m^3)



PSD Emissions Inventory

While air quality monitoring data are representative of the existing background air quality concentrations, they may not adequately reflect the air quality in the area directly impacted by the project. EPA may determine that it is necessary to include sources that have the potential to significantly affect concentrations in the impact area in the modeling inventory for the full impact analysis. Identification of the need for inclusion of local sources is most appropriately done at the time that the modeling protocol is reviewed, to ensure that the application is complete at the time that it is submitted.

The project is located in a rural area, and the impact area is small, making identification of sources for inclusion in the PSD emissions inventory relatively simple. All sources within a 15-mile radius were reviewed for the potential to affect the impact area. A 15 mile radius was selected because this is approximately the distance between the project and the monitoring station that provided ambient $PM_{2.5}$ data. Emission information was provided by the Yolo Solano Air Quality Management District (YSAQMD).

Based on emission rates and distance, the stationary sources listed in Table 4 were identified as having the potential to affect NOx or PM concentrations in the impact area. Emission information and stack parameters for modeling these sources were provided by YSAQMD.

Table 4
PSD Emissions Inventory: Stationary Sources Near Project
CPV Vaca Station

Facility	Distance from CPV, miles	NOx Emissions, TPY	PM_{10} Emissions, TPY	$PM_{2.5}$ Emissions, TPY
California Medical Facility	4.5	65.2	5.1	5.1
Easterly Waste Water Treatment Plant	0.1	15.4	1.2	1.2

Increment Inventory

No projects have been permitted in YSAQMD that consume NO_2, PM_{10}, or $PM_{2.5}$ PSD increment. Therefore, there are no increment-consuming sources in the inventory.

Dispersion Modeling

Dispersion modeling was conducted using AERMOD version 09292. Model options were as described in the May 2008 modeling protocol. A nested grid was developed to efficiently identify the maximum impact areas. This nested grid has the following resolution:

- 25-meter resolution along the facility fence line, with four more rows of receptors spaced 25 meters apart extending out to 100 meters from the fence line;
- 100-meter resolution from 100 meters to 1,000 meters from the fence line; and
- 250-meter resolution from 1 km out to11 km from the site (12 km on the east side, following the direction of the prevailing wind).

24-Hour Average Impacts

Receptors were identified where the project's 24-hour $PM_{2.5}$ impact exceeded 1.2 $\mu g/m^3$ on any day. This level was selected because it is the lowest of the proposed SILs for 24-hour average $PM_{2.5}$.[22] Any project impact below this would not be considered to "cause or contribute" to an air quality violation, regardless of the final SIL adopted by EPA.

Dispersion modeling was then conducted using AERMOD to determine the combined 24-hour average impacts from both the project and from the non-project sources at the receptors identified in the previous step. These combined 24-hour average impacts from the model were added to the measured background concentrations on that day[23], resulting in a predicted 24-hour average concentration for each day at each receptor.

The resulting 24-hour average concentrations at each receptor were compared to the ambient air quality standards to determine whether the project would cause or contribute to a violation of the ambient air quality standard at that receptor. The $PM_{2.5}$ standard has a statistical component: compliance with the standard is determined by the average of the 98^{th} percentile over three consecutive years. Because each year of the Davis monitoring data is comprised of nearly a full year of daily measurements, the 98^{th} percentile is the 8^{th} highest day.

The 8^{th} highest day was determined for receptor, for each year, at the identified receptors. Table 5 presents the maximum 8^{th} highest day impact, over all receptors, for each year. This table shows that, for all receptors at which the project has at least one day of impact above the assumed SIL, the ambient air quality standard is not exceeded.

[22] 72 FR 54115

[23] There are some days of missing data in the data set. For a single day of missing data, the average of the concentrations on bracketing days was used as a substitute. For multiple days, the measurement from the day before the data gap began was used as a substitute.

Table 5
CPV Vaca Station
8th Highest $PM_{2.5}$ Impact (24-hour average)

Year	Receptor	Date	Project Plus Additional Sources Plus Background Concentration (µg/m^3)	Ambient Air Quality Standard (µg/m^3)
2004	238	12/24/2004	32.7	35
2005	796	2/2/2005	28.8	35
2006	1300	12/31/2006	30.0	35
2007	977	12/16/2007	30.5	35

Annual Average Impacts

AERMOD was used to model the combined annual impacts of the project and the two nearby sources. The NOx impacts were modeled using all receptors. PM, PM_{10}, and $PM_{2.5}$ impacts were modeled using the subset of receptors where project PM impacts exceeded 1.2 µg/m^3. The maximum modeled combined impact for each year was added to the regional background annual average impact to determine the highest annual impact for each year. Table 6 shows that the annual ambient air quality standard for $PM_{2.5}$ is not exceeded.

Table 6
Highest $PM_{2.5}$ Impact (annual average)

Year	Highest Impact of Project Plus Nearby Sources (µg/m^3)	Regional Background Concentration (µg/m^3)[a]	Highest Combined Impact (µg/m^3)	Ambient Air Quality Standard (µg/m^3)
2004	4.0	9.4	13.4	15
2005	4.5	9.7[b]	14.2	15
2006	4.2	8.0	12.2	15
2007	3.8	8.8	12.6	15

[a]Background annual arithmetic mean measured at Davis monitoring station.
[b]Background annual arithmetic mean not reported by ARB because June 2005 had less than 75% data. Calculated here as the mean of the four quarterly arithmetic means. The second quarter concentration is the arithmetic mean of its three monthly arithmetic means, and the June concentration is the arithmetic mean of the successfully monitored 15 daily arithmetic means.

Conclusion

This supplement to the full ambient air quality analysis demonstrates that, for all receptors, either the project's impact is below the SIL, or the ambient air quality standard is not exceeded. As a result, the project does not cause or contribute to an exceedance of the $PM_{2.5}$ ambient air quality standard.

APPENDIX A

MODELING PARAMETERS FOR $PM_{2.5}$ (REVISED COOLING TOWER DESIGN)

Emission Parameters

Emission parameters for all sources except for the cooling tower are the same as in the initial PSD application. Emission parameters used in the supplemental impact analysis that are different from those used in the initial PSD application are indicated in the tables below in underline/strikeout format to make the changes clear.

Differences fall into two categories. Most of the changes are due to a redesign of the cooling tower which lowered water circulation rates and thus lowered PM emissions. The second category of difference is that the supplemental analysis assumes that all of the PM from the cooling tower is emitted as $PM_{2.5}$. As discussed in the initial PSD application, this assumption is extremely conservative. However, compliance can be demonstrated using the conservative assumption. It is therefore unnecessary to argue the point.

Table 5.1A-4
Calculation of Cooling Tower
Emissions

PM10 Emissions based on TDS Level	
TDS level, ppm	9000
PM, lb/hr	~~4.16~~ 3.19
PM, lb/day	~~99.9~~ 76.6
PM, tpy	~~18.22~~ 13.99
PM10, lb/hr	~~1.83~~ 1.41
PM10, lb/day	~~43.9~~ 33.7
PM10, tpy	~~8.02~~ 6.15
PM2.5, lb/hr	~~0.62~~ 0.48
PM2.5, lb/day	~~15.0~~ 11.5
PM2.5, tpy	~~2.73~~ 2.10

Based on 8760 hrs/yr

12	cells	
~~44.34~~ 52.34	Height, ft	
~~10.8~~35.6	Diameter, ft	
~~69~~ 93.14	exhaust temp, F	
~~1513000~~ 1,722,000	air flow, CFM per cell	
	PM10 fraction	0.44
	PM2.5 fraction	0.15

Parameter	Old value	New value
Model Number	F4910-6.0-12	F4910-6.6-12
Tower width	60.00 ft	60.00
Tower length	720.67 ft	720.67 ft
Tower height	49.84 ft	52.34 ft
Tower water flow	185,000 gpm	142,000 gpm
Air flow rate (discharge)	1,686,000 cfm per cell	1,722,000 cfm per cell
Discharge velocity	1586 fpm	1727 fpm
Outlet air temperature	89.75 F	93.14 F
Emissions	4.16 lb/hr	3.19 lb/hr

Table 5.1B-5B

Emission Rates and Stack Parameters for Refined Modeling (Siemens)

	Stack Diam, m	Stack Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s NOx	SO_2	CO	PM_{10}	Stack Diam, ft	Stack Height ft	Exh Temp, Deg F	Exh Flow Rate, ft3/m	Exhaust Velocity, ft/s	Emission Rates, lb/hr NOx	SO_2	CO	PM_{10}
Averaging Period: One hour NOx																		
Gas Turbine 1	5.6	45.7	345	483.6	19.4	2.3589	n/a	n/a	n/a	18.5	150	162	1,024,686	63.53	18.72	n/a	n/a	n/a
Gas Turbine 2	5.6	45.7	345	483.6	19.4	2.3589	n/a	n/a	n/a	18.5	150	162	1,024,686	63.53	18.72	n/a	n/a	n/a
Auxiliary Boiler	0.8	9.1	464	5.7	12.5	0.0505	n/a	n/a	n/a	2.5	30	375	12,063	40.96	0.40	n/a	n/a	n/a
Fire Pump Engine	0.1	12.2	683	0.8	64.8	0.3633	n/a	n/a	n/a	0.4	40	770	1,740	212.68	2.88	n/a	n/a	n/a
Emergency Engine	0.2	12.2	791	4.0	122.1	2.0083	n/a	n/a	n/a	0.7	40	965	8,387	400.45	15.94	n/a	n/a	n/a
Cooling Tower (per cell)	3.3	13.5	294	59.5	7.0	n/a	n/a	n/a	n/a	10.8	44	69	126,083	22.94	n/a	n/a	n/a	n/a
Averaging Period: One hour CO and SOx																		
Gas Turbine 1	5.6	45.7	345	483.6	19.4	n/a	0.8995	2.1543	n/a	18.5	150	162	1024685.95	63.53	n/a	7.14	17.10	n/a
Gas Turbine 2	5.6	45.7	345	483.6	19.4	n/a	0.8995	2.1543	n/a	18.5	150	162	1024685.95	63.53	n/a	7.14	17.10	n/a
Auxiliary Boiler	5.6	9.1	464	5.7	0.2	n/a	0.0074	0.1708	n/a	18.5	30	375	12,063	0.75	n/a	0.06	1.36	n/a
Fire Pump Engine	0.1	12.2	683	0.8	64.8	n/a	0.0004	0.0267	n/a	0.4	40.0	770.0	1740.0	212.68	n/a	0.00	0.21	n/a
Emergency Engine	0.2	12.2	791	4.0	122.1	n/a	0.0020	0.0792	n/a	0.7	40.0	965.0	8387.0	400.45	n/a	0.02	0.63	n/a
Averaging Period: Three hours SOx																		
Gas Turbine 1	5.6	45.7	345	483.6	19.4	n/a	0.8995	n/a	n/a	18.5	150	162	1,024,686	63.53	n/a	7.14	n/a	n/a
Gas Turbine 2	5.6	45.7	345	483.6	19.4	n/a	0.8995	n/a	n/a	18.5	150	162	1024685.95	63.53	n/a	7.14	n/a	n/a
Auxiliary Boiler	5.6	9.1	464	5.7	0.2	n/a	0.0074	n/a	n/a	18.5	30	375	12,063	0.75	n/a	0.06	n/a	n/a
Fire Pump Engine	0.1	12.2	683	0.8	64.8	n/a	0.0001	n/a	n/a	0.4	40.0	770.0	1740.0	212.68	n/a	0.00	n/a	n/a
Emergency Engine	0.2	12.2	791	4.0	122.1	n/a	0.0007	n/a	n/a	0.7	40.0	965.0	8387.0	400.45	n/a	0.01	n/a	n/a

Table 5.1B-5B (cont'd)

Emission Rates and Stack Parameters for Refined Modeling (Siemens)

	Stack Diam, m	Stack Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s NOx	SO_2	CO	PM_{10}	Stack Diam, ft	Stack Height ft	Exh Temp, Deg F	Exh Flow Rate, ft3/m	Exhaust Velocity, ft/s	Emission Rates, lb/hr NOx	SO_2	CO	PM_{10}
Averaging Period: Eight hours CO																		
Gas Turbine 1	5.6	45.7	345	469.4	18.8	n/a	n/a	2.0564	n/a	18.5	150	162	994,688	61.67	n/a	n/a	16.32	n/a
Gas Turbine 2	5.6	45.7	345	469.4	18.8	n/a	n/a	2.0564	n/a	18.5	150	162	994,688	61.67	n/a	n/a	16.32	n/a
Auxiliary Boiler	5.6	9.1	464	5.7	0.2	n/a	n/a	0.1708	n/a	18.5	30	375	12,063	0.75	n/a	n/a	1.36	n/a
Fire Pump Engine	0.1	12.2	683	0.8	64.8	n/a	n/a	0.0033	n/a	0.4	40.0	770.0	1740.0	212.68	n/a	n/a	0.03	n/a
Emergency Engine	0.2	12.2	791	4.0	122.1	n/a	n/a	0.0099	n/a	0.7	40.0	965.0	8387.0	400.45	n/a	n/a	0.08	n/a
Averaging Period: 24-hour SOx																		
Gas Turbine 1	5.6	45.7	345	483.6	19.4	n/a	0.8995	n/a	n/a	18.5	150	162	1,024,686	63.53	n/a	7.14	n/a	n/a
Gas Turbine 2	5.6	45.7	345	483.6	19.4	n/a	0.8995	n/a	n/a	18.5	150	162	1,024,686	63.53	n/a	7.14	n/a	n/a
Auxiliary Boiler	5.6	9.1	464	5.7	0.2	n/a	0.0031	n/a	n/a	18.5	30	375	12,063	0.75	n/a	0.02	n/a	n/a
Fire Pump Engine	0.1	12.2	683	0.8	64.8	n/a	0.0000	n/a	n/a	0.4	40.0	770.0	1740.0	212.68	n/a	0.00	n/a	n/a
Emergency Engine	0.2	12.2	791	4.0	122.1	n/a	0.0001	n/a	n/a	0.7	40.0	965.0	8387.0	400.45	n/a	0.00	n/a	n/a
Averaging Period: 24-hour PM10																		
Gas Turbine 1	5.6	45.7	377	469.0	18.8	n/a	n/a	n/a	0.9450	18.5	150	219	993,833	61.62	n/a	n/a	n/a	7.50
Gas Turbine 2	5.6	45.7	377	469.0	18.8	n/a	n/a	n/a	0.9450	18.5	150	219	993,833	61.62	n/a	n/a	n/a	7.50
Auxiliary Boiler	5.6	9.1	464	5.7	0.2	n/a	n/a	n/a	0.0146	18.5	30	375	12,063	0.75	n/a	n/a	n/a	0.12
Fire Pump Engine	0.1	12.2	683	0.8	64.8	n/a	n/a	n/a	0.0004	0.4	40.0	770.0	1740.0	212.68	n/a	n/a	n/a	0.00
Emergency Engine	0.2	12.2	791	4.0	122.1	n/a	n/a	n/a	0.0004	0.7	40.0	965.0	8387.0	400.45	n/a	n/a	n/a	0.00
Cooling Tower (per cell)	3.3	13.5	294	59.5	7.0	n/a	n/a	n/a	0.0437	10.8	44.3	69.0	126083.3	22.94	n/a	n/a	n/a	0.15

Table 5.1B-5B (cont'd)

Emission Rates and Stack Parameters for Refined Modeling (Siemens)

	Stack Diam, m	Stack Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s NOx	SO_2	CO	PM_{10}	Stack Diam, ft	Stack Height ft	Exh Temp, Deg F	Exh Flow Rate, ft3/m	Exhaust Velocity, ft/s	Emission Rates, lb/hr NOx	SO_2	CO	PM_{10}
Averaging Period: Annual NOx and SOx																		
Gas Turbine 1	5.6	45.7	345	469.4	18.8	2.2504	0.1724	n/a	n/a	18.5	150	162	994,688	61.67	17.86	1.37	n/a	n/a
Gas Turbine 2	5.6	45.7	345	469.4	18.8	2.2504	0.1724	n/a	n/a	18.5	150	162	994,688	61.67	17.86	1.37	n/a	n/a
Auxiliary Boiler	5.6	9.1	464	5.7	0.2	0.0222	0.0008	n/a	n/a	18.5	30	375	12,063	0.75	0.18	0.01	n/a	n/a
Fire Pump Engine	0.1	12.2	683	0.8	64.8	0.0021	0.0000	n/a	n/a	0.4	40.0	770.0	1740.0	212.68	0.02	0.00	n/a	n/a
Emergency Engine	0.2	12.2	791	4.0	122.1	0.0115	0.0000	n/a	n/a	0.7	40.0	965.0	8387.0	400.45	0.09	0.00	n/a	n/a
Averaging Period: Annual PM10																		
Gas Turbine 1	5.6	45.7	370	412.6	16.5	n/a	n/a	n/a	0.7875	18.5	150	206	874,296	54.21	n/a	n/a	n/a	6.25
Gas Turbine 2	5.6	45.7	370	412.6	16.5	n/a	n/a	n/a	0.7875	18.5	150	206	874,296	54.21	n/a	n/a	n/a	6.25
Auxiliary Boiler	5.6	9.1	464	5.7	0.2	n/a	n/a	n/a	0.0154	18.5	30	375	12,063	0.75	n/a	n/a	n/a	0.12
Fire Pump Engine	0.1	12.2	683	0.8	64.8	n/a	n/a	n/a	0.0001	0.4	40.0	770.0	1740.0	212.68	n/a	n/a	n/a	0.00
Emergency Engine	0.2	12.2	791	4.0	122.1	n/a	n/a	n/a	0.0001	0.7	40.0	965.0	8387.0	400.45	n/a	n/a	n/a	0.00
Cooling Tower (per cell)	3.3	13.5	294	59.5	7.0	n/a	n/a	n/a	0.0437	10.8	44.3	69.0	126083.3	22.94	n/a	n/a	n/a	0.15

STATE OF CALIFORNIA
ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

In the Matter of:	)	Docket No. 08-AFC-11
	)	
Application for Certification,	)	**PROOF OF SERVICE**
for the CPV VACA STATION POWER PLANT	)	
PROJECT	)	(January 20, 2010)
by CPV Vacaville, LLC	)	
	)	

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CPV VACA STATION POWER PLANT PROJECT
CEC Docket No. 08-AFC-11

DECLARATION OF SERVICE

I, Paul Kihm, declare that on February 3, 2010, I served and filed copies of the attached:

SUPPLEMENT TO PSD FULL IMPACT ANALYSIS

to all parties identified on the Proof of Service List above in the following manner:

California Energy Commission Docket Unit

☒ Transmission via electronic mail and by depositing a copy via FedEx overnight mail delivery service at Costa Mesa, California, with delivery fees thereon fully prepaid and addressed to the following:

CALIFORNIA ENERGY COMMISSION
Attn: DOCKET NO. 08-AFC-11
1516 Ninth Street, MS-4
Sacramento, California 95814-5512
docket@energy.state.ca.us

For Service to All Other Parties

☒ Transmission via electronic mail to all email addresses on the Proof of Service list; and

☒ by depositing one paper copy with the United States Postal Service via first-class mail at Costa Mesa, California, with postage fees thereon fully prepaid and addressed as provided on the Proof of Service list to those addresses **NOT** marked "email preferred."

I further declare that transmission via electronic mail and U.S. Mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 3, 2010, at Costa Mesa, California.

Paul Kihm