OFFICE MEMORANDUM

July 27, 2009

TO: WEYMAN LEE

VIA: SCOTT LUTZ SBL
BARRY YOUNG BGY
BOB NISHIMURA BN 8/6/09

FROM: GLEN LONG GCL

SUBJECT: PSD $PM_{2.5}$ AIR QUALITY IMPACT ANALYSIS AND REVISED SOILS AND VEGATION IMPACTS ANALYSIS FOR RUSSELL CITY ENERGY CENTER, PERMIT APPLICATION # 15487

I have reviewed the attached supplemental modeling analysis for $PM_{2.5}$ submitted for the Russell City Energy Center from Atmospheric Dynamics entitled "PM2.5 PSD SOURCE IMPACT ANALYSIS". Also attached is my review.

The proposed project would not interfere with the attainment or maintenance of applicable ambient air quality standards for $PM_{2.5}$. The applicant's analysis was based on current USEPA-approved models and calculation procedures and was performed in accordance with 40 C.F.R. Section 52.21(l) and Section 414 of the District's NSR Rule (Regulation 2 Rule 2).

I have also revised the initial December 8, 2008, Soils and Vegetation Impacts Analysis for the Russell City Energy Center. This revision incorporates additional more recent soils and vegetation survey information, as well as additional evaluation of the potential for soils and vegetation impacts from $PM_{2.5}$ and nitrogen deposition. My revised analysis is also attached.

SUMMARY OF AIR QUALITY IMPACT ANALYSIS FOR $PM_{2.5}$ FROM THE RUSSELL CITY ENERGY CENTER

July 27, 2009

BACKGROUND

Russell City Energy Center LLC has submitted a permit application (# 15487) for a proposed 600 MW combined cycle power plant, the Russell City Energy Center (RCEC). The facility is to consist of two natural gas-fired turbines with supplementary fired heat recovery steam generators, one steam turbine and supplemental burners (duct burners), a 9-cell cooling tower, and a diesel fire pump engine. The proposed project will result in air pollutant emissions of NO_2, CO, $PM_{2.5}$, PM_{10} triggering regulatory requirements for a PSD air quality impact analysis under 40 C.F.R. section 52.21(k)-(o).

In the District's "December 2008 Statement of Basis for Draft Amended Federal Prevention of Significant Deterioration Permit for RCEC" (Statement of Basis) the air quality impacts for NO_2, CO, PM_{10} were documented. The results of the air quality impact analysis showed that the proposed project would not interfere with the attainment or maintenance of any of these applicable ambient air quality standards.

The District is now proposing to lower the maximum permitted emission rates for CO and PM_{10}. Since emissions at the original higher rates would not interfere with the attainment of any applicable ambient air quality standards, the District concludes that emissions at the reduced rates currently being proposed would not interfere with the attainment or maintenance of any such standards.

In addition, on April 24, 2009, the U.S. Environmental Protection Agency (USEPA) stayed the effectiveness of 40 C.F.R. section 52.21(i)(1)(xi), an exemption that allowed the use of a PM_{10} analysis as a surrogate for a $PM_{2.5}$ for federal PSD permit applicants whose applications were deemed complete prior to July 15, 2008. Because the District can no longer use this PM_{10} surrogate policy to address $PM_{2.5}$ impacts, it is required to perform an analysis of $PM_{2.5}$ impacts specifically. The impacts are summarized below.

AIR QUALITY IMPACT ANALYSIS REQUIREMENTS

Requirements for air quality impact analysis are given in 40 C.F.R. Section 52.21(k)-(o) and related authorities. The Air District has also adopted regulations on performing air quality impact analysis in its New Source Review (NSR) Rule: Regulation 2, Rule 2. These regulations provide additional guidance on performing air quality impact analyses, but do not override the USEPA regulations. In the case of any inconsistency between Air District Rule 2, Regulation 2 and 40 C.F.R. Section 52.21, the federal regulations are controlling.

The criteria pollutant annual worst-case emission increases for the Project are listed in Table I, along with the corresponding significant emission rates for air quality impact analysis.

TABLE I
Comparison of proposed project's annual worst-case emissions
to significant emission rates for air quality impact analysis (tons/year)

Pollutant	Proposed Project's Emissions	PSD "Major Source" Threshold Emission Rate	USEPA PSD Significant Emission Rate
NO_2	127	100	40
CO	330	100	100
PM_{10}	71.8	100	15
SO_2	12.2	100	40
$PM_{2.5}$	71.8	100	10

Table I indicates that the proposed project emissions exceed the PSD "major source" threshold level of 100 tons of any PSD-regulated pollutant. The source is classified as a major stationary source as defined under the Federal Clean Air Act. Therefore, the air quality impact must be investigated for all pollutants emitted in quantities larger than the USEPA PSD significant emission rates (shown in the last column in Table I). Table I shows that the NO_2, CO, PM_{10}, and $PM_{2.5}$ ambient impacts from the project must be evaluated. The detailed requirements for an air quality impact analysis for these pollutants are given in 40 C.F.R. Section 52.21, District Regulation 2, Rule 2, and USEPA guidance documents. As stated previously, the "December 2008 Statement of Basis for Draft Amended Federal Prevention of Significant Deterioration Permit for RCEC" (Statement of Basis) documented the air quality impacts for NO_2, CO, and PM_{10}. This supplemental analysis addresses the $PM_{2.5}$ impacts.

The PSD Regulations also contain requirements for certain additional impact analyses associated with air pollutant emissions. An applicant for a permit that requires an air quality impact analysis must also, according to 40 C.F.R. Section 52.21(o) and Section 417 of the NSR Rule, provide an analysis of the impact of the source and source-related growth on visibility, soils and vegetation.

AIR QUALITY IMPACT ANALYSIS SUMMARY

The required contents of an air quality impact analysis are specified in USEPA's NSR Workshop Manual and Section 414 of Regulation 2 Rule 2. According to subsection 414.1 and the NSR Workshop Manual, if the maximum air quality impacts of a new or modified stationary source do not exceed significance levels for air quality impacts, as defined in Section 2-2-233 and the NSR Workshop Manual, no further analysis is required. (Consistent with USEPA regulations, it is assumed that emission increases will not interfere with the attainment or maintenance of AAQS, or cause an exceedance of a PSD increment if the resulting maximum air quality impacts are less than specified significance levels.) If the maximum impact for a particular pollutant is predicted to exceed the significance impact level, a full impact analysis is required involving estimation of background pollutant concentrations and, if applicable, a PSD increment consumption analysis. USEPA also requires an analysis of any PSD source that may impact a Class I area.

In September 2007 USEPA proposed three different 24-hour and annual average significant impact levels for $PM_{2.5}$ ("Prevention of Significant Deterioration (PSD) for Particulate Matter Less than 2.5 Micrometers ($PM_{2.5}$) – Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Proposed Rule, Federal Register, Volume 72, Number 183, pages 54111-54156, September 21, 2007). The $PM_{2.5}$ levels have not been promulgated and USEPA does not have plans to finalize them until later next year. Therefore to be conservative, the lowest of the three proposed significant impact levels will be used for each averaging period for comparison purposes.

Air Quality Modeling Methodology

Maximum ambient concentrations of $PM_{2.5}$ were estimated for various plume dispersion scenarios using established modeling procedures. The plume dispersion scenarios addressed include simple terrain impacts (for receptors located below stack height), complex terrain impacts (for receptors located at or above stack height), impacts due to building downwash, impacts due to inversion breakup fumigation, and impacts due to shoreline fumigation.

Emissions from the turbines and burners will be exhausted from two 145-foot exhaust stacks and the fire pump will be exhausted from a 15-foot exhaust stack. Emissions from a 9-cell cooling tower will be released at a height of 60 feet. Table II contains the emission rates used in each of the modeling scenarios: maximum 24-hour and maximum annual average.

TABLE II
Averaging period emission rates used in modeling analysis (g/s)

Pollutant Source	Max. (24-hour)	Max. (Annual)
$PM_{2.5}$		
Turbine/Duct Burner 1	0.945	0.895
Turbine/Duct Burner 2	0.945	0.895
Fire Pump	0.000417	0.0000594
Each Cooling Tower Cell (9 total))	0.0307	0.0299

The USEPA guideline models AERMOD (version 07026) and SCREEN3 (version 96043) were used in the air quality impacts analysis. Because an Auer land use analysis showed that the area within 3 km is classified as rural, the AERMOD option of increased surface heating due to the urban heat island was not selected.

Meteorological data was available from the Automated Surface Observing System (ASOS) at the Oakland International Airport for the years 2003-2007. The site is located 20.8 kilometers to the northwest of the RCEC. AERSURFACE (version 08009) was used to determine surface characteristics in accordance with USEPA's January 2008 "AERMOD Implementation Guide" at both the Oakland Airport and the RCEC project site. The Oakland meteorological surface data (OAK) was considered as appropriate for the Russell City Energy Center project site. This decision was based upon the procedures set forth in the Guideline on Air Quality Models (40 CFR

Part 51) section 8.3. The Guideline on Air Quality Models states the following conditions should be considered when determining if weather data is representative: (1) The proximity of the meteorological monitoring site to the area under consideration; (2) the complexity of the terrain; (3) the exposure of the meteorological monitoring site; and (4) the period of time during which data are collected.

In all four cases, the OAK data was considered appropriate for modeling the proposed project. Both the Oakland Airport and the proposed project location are along the East Bay shoreline with similar predominant upwind fetches. As mentioned earlier, the AERSURFACE analysis also showed that the sites had similar land use characteristics. Both sites are located on simple terrain in similar proximity to the complex terrain to the east. The Oakland Airport site is a permanent National Weather Service (NWS)/Federal Aviation Administration weather installation that operates 24 hours per day. The most recent five years of data at the time (2003-2007) were used for this modeling study. Based upon this comparison, the Oakland ASOS data were considered representative of the proposed project location and met all USEPA data completeness requirements.

Upper air data for the same time period was available from the closest representative NWS radiosonde station, also the Oakland International Airport.

Because the exhaust stacks are less than Good Engineering Practice (GEP) stack height, ambient impacts due to building downwash were evaluated using the Building Profile Input Program for PRIME [BPIPPRM (version 04274)]. Inversion breakup fumigation and shoreline fumigation were evaluated using the SCREEN3 model.

Air Quality Modeling Results

The maximum predicted ambient impacts of the various modeling procedures described above are summarized in Table III for the averaging periods for which AAQS and PSD increments have been set. Shown in Figure 1 are the locations of the maximum modeled impacts.

TABLE III

Maximum predicted ambient impacts of proposed project ($\mu g/m^3$)

[maximums are in bold type]

Pollutant	Averaging Time	Inversion Break-up Fumigation Impact	Shoreline Fumigation Impact	Normal operation	Significant Air Quality Impact Level
$PM_{2.5}$	24-hour annual	4.6[a] —	4.9[a] —	**4.9**[a] **0.50**[a]	1.2 0.3

[a] highest first high concentration

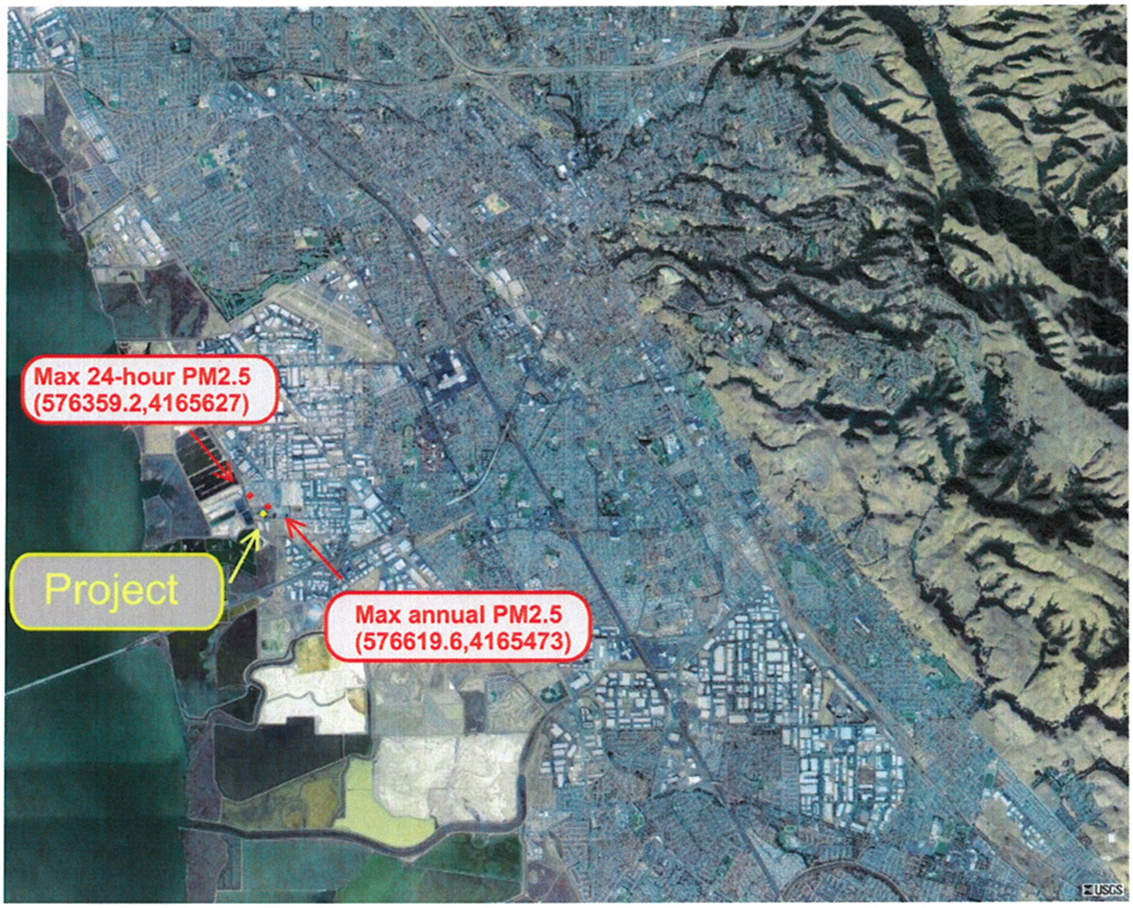

FIGURE 1. Location of project maximum impacts.

Also shown in Table III are the most conservative of the corresponding draft proposed 2007 significant air quality impact levels. In accordance with the NSR Workshop Manual and Regulation 2-2-414, further analysis is required only for the those pollutants for which the modeled impact is above the significant air quality impact level. Since Table III shows that both the 24-hour and the annual average $PM_{2.5}$ impacts exceed the significant impacts levels, a full National Ambient Air Quality Standard analysis is required for both averaging periods.

Background Air Quality Levels

The geographical area, or impact area, for which the analysis for the National Air Quality Standards (NAAQS) is carried out is defined as the circular area that includes all receptor locations where the proposed project causes a significant ambient impact (equal to or exceeding the significant impact level). The impact area is the maximum area evaluated for all applicable averaging periods (for $PM_{2.5}$ it is evaluated for the 24-hour and annual average periods). Over 30,000 receptors were modeled in the modeling domain of 20.4 km by 20.6 km with a telescoping grid spacing of 10 m to 200 m. For the annual average impact, all significant impacts occurred within 450 meters of the proposed project. For the 24-hour average impact, almost all of the significant impacts occurred close to the proposed project- within 1.26 km- where there were approximately 18,400 receptors. But, there were 6 isolated receptors in complex terrain showing small increases over the significance level (between 1.2 and 1.4 $\mu g/m^3$) at a distance of 7.1 to 8.1 km east of the project. The impact area for the 24-hour average is larger than the annual average impact area, therefore, the impact area is a circular area around the proposed project with a radius of 8.1 km.

In September 2007, USEPA proposed three significant monitoring concentration levels (SMCs) for $PM_{2.5}$. The $PM_{2.5}$ SMCs have not been promulgated and USEPA does not have plans to finalize them until later next year. Therefore to be conservative, the lowest of the three proposed SMCs will be used. As shown in Table IV below, the maximum 24-hour impact from the project exceeds the lowest of the three proposed SMCs.

TABLE IV

Most conservative proposed PSD significant monitoring concentration level and maximum impact from the proposed project for $PM_{2.5}$ ($\mu g/m^3$)

Averaging Time	Significant Monitoring Concentration	Maximum Impact from Proposed Project
24-hour	2.3	4.9

As specified in USEPA's NSR Workshop Manual, regional monitoring sites may be used if the site is representative of air quality of the area and meets the following criteria:

- monitor location
- quality of data
- currentness of data

The District-operated Fremont-Chapel Way Monitoring Station, located 18.3 km southeast of the project was analyzed for representativeness of background $PM_{2.5}$ concentrations. Figures 2 through 4 graphically display $PM_{2.5}$ emissions during the winter of 2005 (historically winter is the season when the Bay Area experiences the highest $PM_{2.5}$ concentrations).

In all three figures, the Fremont-Chapel Way Monitoring Station grid cell shows higher emissions than the grid cell of the proposed project. This is also true if the adjoining cells are summed in the comparison. The emissions shown in the figures show that we can reasonably assume that background ambient concentrations are similar, if not lower, at the proposed project site than at the Fremont-Chapel Way Monitoring Station location. Therefore the Fremont-Chapel Way Monitoring Station is representative of the $PM_{2.5}$ concentrations in the area.

The Fremont-Chapel Way Monitoring Station is a currently operated site and meets all USEPA ambient monitoring data requirements ("Ambient Monitoring Guidelines for Prevention of Significant Deterioration", EPA-450/4-87-007, May 1987). Therefore, representativeness and all three criteria have been met.

TABLE V
Fremont- Chapel Way Monitoring Station $PM_{2.5}$ ($\mu g/m^3$)
[bold type signifies value used in analysis]

Year	98^{th} percentile 24-hour average	Annual Average
2006	30.4	10.3
2007	33.3	8.7
2008	22.7	9.4
3-year average	**29**	**9.5**

National Ambient Air Quality Standards Modeling Comparison

The Fremont-Chapel Way Monitoring station is regionally representative of the background $PM_{2.5}$. Local sources that could have a significant impact in the project impact area should also be modeled.

California Highway 92 is located 0.75 miles south of the project. Therefore, $PM_{2.5}$ emissions from Highway 92 were included in the analysis. EMFAC version 2.3 and 2007 CalTrans annual average daily traffic count data were used to determine $PM_{2.5}$ emission levels.

A search was also performed of the District's database for new $PM_{2.5}$ sources within six miles of the project that had received Authority to Constructs or Permits to Operates since January 1, 2007. A total of 29 sources were found and included in the analysis (21 of the 29 sources are diesel back-up generators).

All sources (the proposed project, motor vehicular emissions from Highway 92, and the 29 District sources) were then modeled with the dispersion model AERMOD as described under the section ***Air Quality Modeling Methodology*** above.

The maximum 98^{th} percentile (highest 8^{th} high) modeled 24-hour concentration from all sources was found to be 11.3 $\mu g/m^3$. The maximum annual concentration from all sources was found to be 1.06 $\mu g/m^3$. In accordance with the NSR Workshop Manual, a source will not be considered to cause or contribute to a NAAQS exceedance if its own impact is not significant at any violating receptor at the time of each predicted violation.

AERMOD was run again using the EVENT postprocessor to determine source-by-source contributions at receptors with total concentrations exceeding 6 $\mu g/m^3$ (the 24-hour NAAQS for $PM_{2.5}$ is 35 $\mu g/m^3$ and Table V shows the background concentration as 29 $\mu g/m^3$). These are the receptors that could show a potential violation of the Federal 24-hour standard. For all hours of the five year meteorological data period, the proposed project did not produce a significant impact

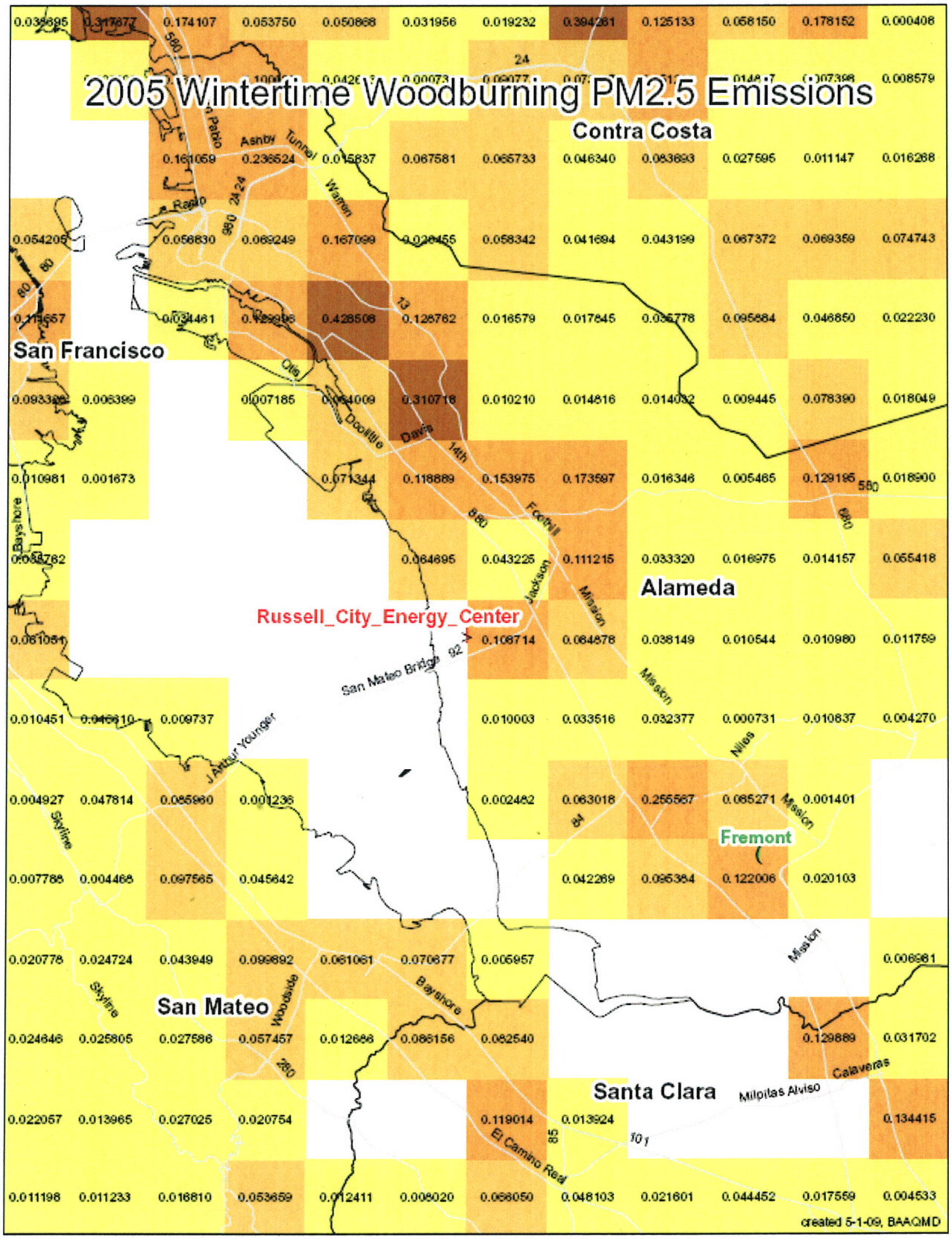

FIGURE 2. 2005 Wintertime woodburning $PM_{2.5}$ emissions (tons/day).

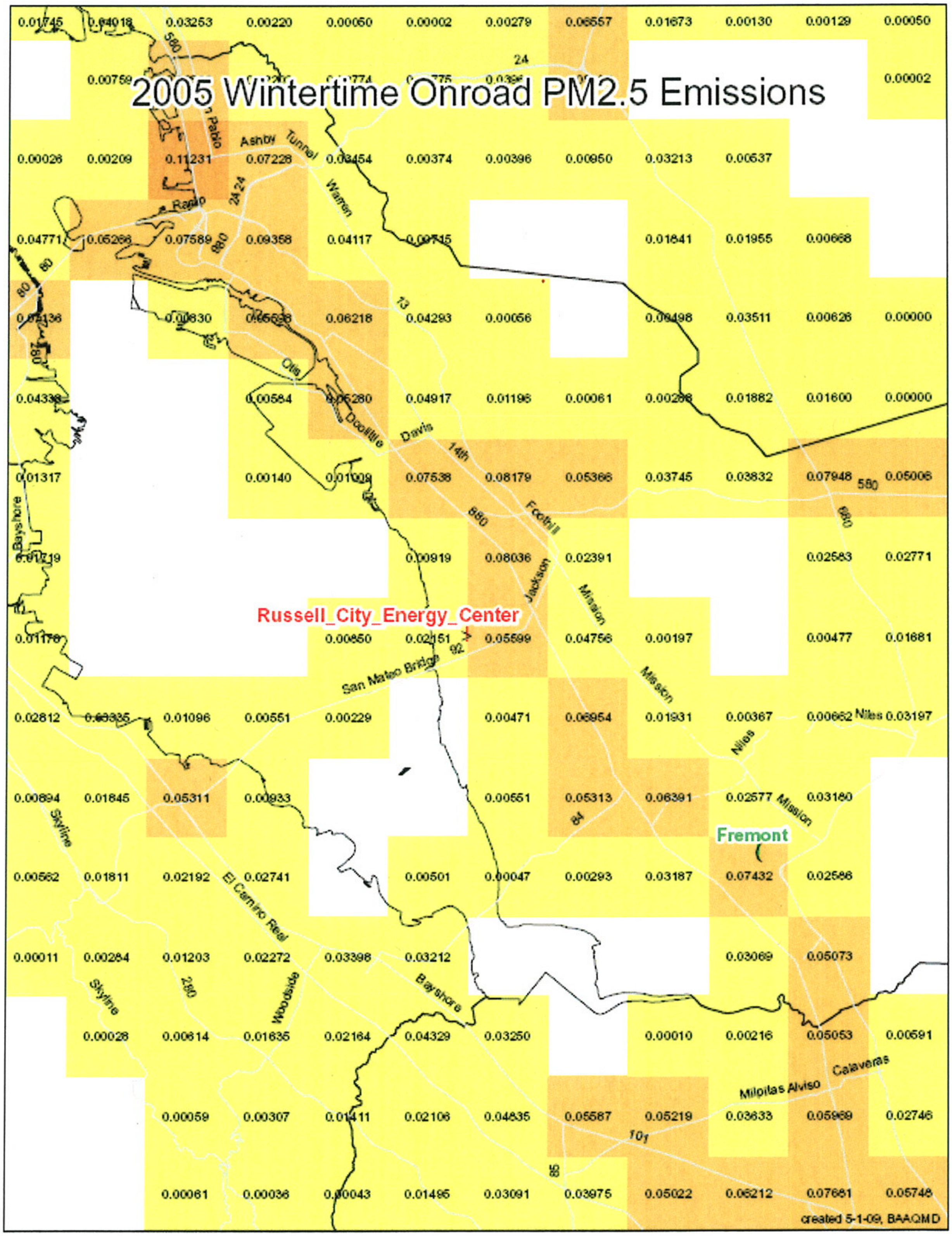

FIGURE 3. 2005 Wintertime on-road $PM_{2.5}$ emissions (tons/day).

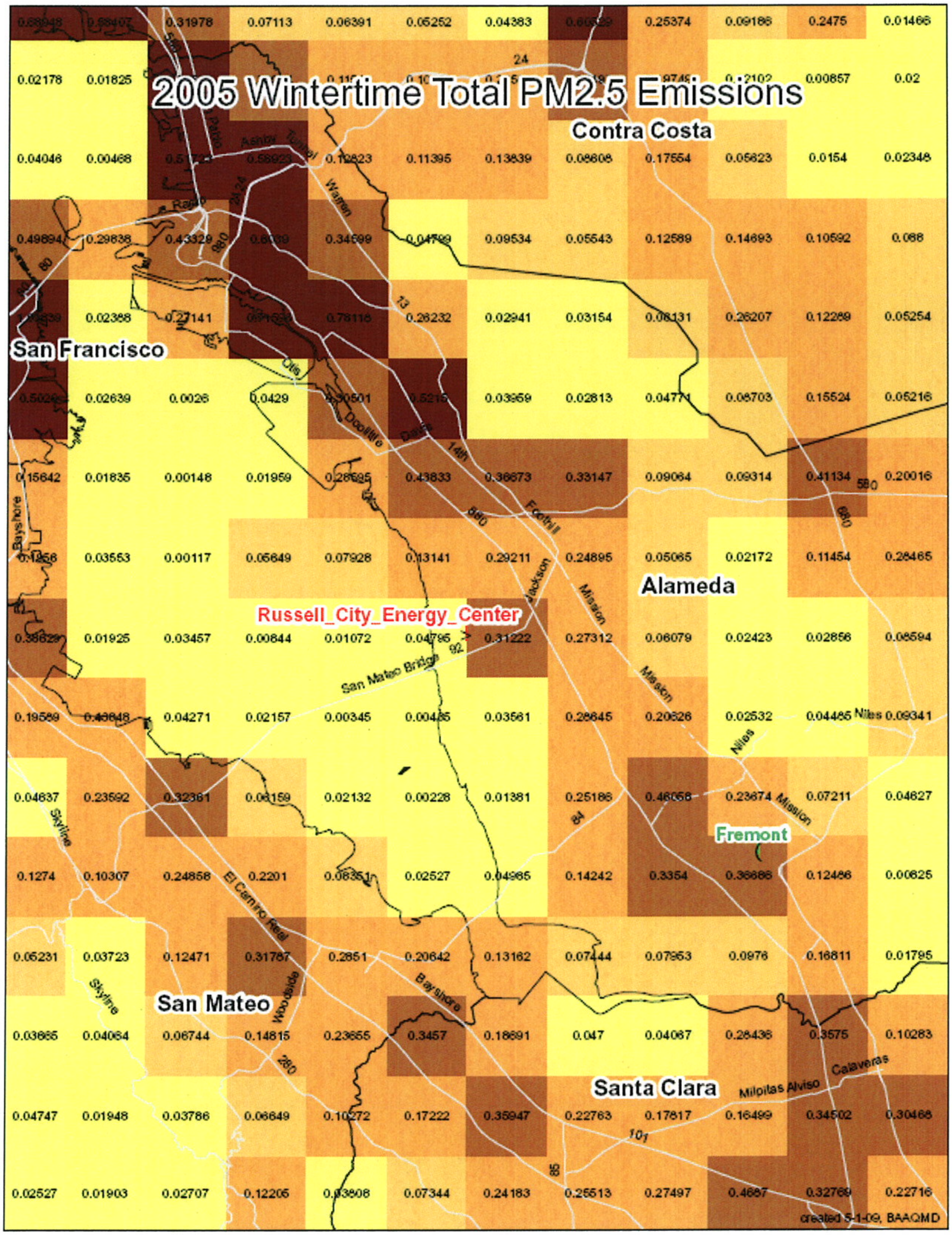

FIGURE 4. 2005 Wintertime total $PM_{2.5}$ emissions (tons/day).

(1.2 μg/m^3) at any of the post processed receptors. Thus the project will not cause or contribute to a NAAQS $PM_{2.5}$ 24-hour standard exceedance.

AERMOD was then run once more with the additional background sources to determine the annual average impact. Only those receptors where a significant impact level (0.3 μg/m^3) were predicted for the proposed project were included in this run. The combined maximum impact from the proposed project and the local sources at these receptors is 1.06 μg/m^3. The combined maximum results of these runs with the background monitoring data is 10.6 μg/m^3,which is below the Federal standard of 15 μg/m^3. Thus the project will also not cause or contribute to a NAAQS $PM_{2.5}$ annual average exceedance.

PSD Increment Consumption Analysis

In the September 2007 Proposed Rule, USEPA is considering three possible $PM_{2.5}$ PSD increments for Class I, II and III areas. No increment has yet been finalized. Without a promulgated $PM_{2.5}$ PSD increment, an increment consumption cannot be performed and an analysis is not required ("Implementation of the New Source Review Program for Particulate Matter Less than 2.5 Micrometers in Diameter ($PM_{2.5}$), Response to Comments, EPA, Office of Air Quality Policy and Standard, Air Quality Policy Division, New Source Review Group, March 2008.) However, even if the most stringent of the proposed increments were finalized and applicable at this stage, the project would not cause or contribute to an exceedance.

CLASS I AREA IMPACT ANALYSIS

In accordance with the NSR Workshop Manual, an impact analysis must be performed for any PSD source within 100 km of a Class I area which increases air pollutant concentrations by 1 μg/m^3 or more (24-hour average) inside the Class I area. Point Reyes National Seashore is located roughly 62 km northwest of the project, and is the only Class I area within 100 km of the facility. Shown in Table VI below are the results from the previous impact analysis using AERMOD presented in the "December 2008 Statement of Basis for Draft Amended Federal Prevention of Significant Deterioration Permit for RCEC" (Statement of Basis) for both PM_{10} and $PM_{2.5}$. Emissions of both PM_{10} and $PM_{2.5}$ have decreased since that analysis was performed. It was conservatively assumed that all of the PM_{10} was also in the form of $PM_{2.5}$. The table below shows that the maximum 24-hour $PM_{2.5}$ impacts within the Point Reyes National Seashore are well below the 1 μg/m^3 significance level.

TABLE VI

Class I 24-hour air quality impacts analysis for the Point Reyes National Seashore (μg/m^3)

Pollutant	AERMOD	Significance level	Significant
PM_{10} /$PM_{2.5}$	0.06	1.0	no

ADDITIONAL IMPACTS ANALYSIS

The USEPA NSR Workshop Manual states that all PSD analysis must include an additional impacts analysis. The additional impacts analysis assesses the impacts on soils, vegetation, and visibility caused by any increase in emissions of any regulated pollutant from the source and associated growth. The District included an additional impacts analysis in its initial December 88, 2008, PSD Air Quality Impact Analysis document. The District has supplemented its analysis for PM2.5 as set forth below.

Visibility Impairment Analysis

Visibility impacts were assessed using both USEPA's VISCREEN visibility screening model and the Calpuff model. Both analyses show that the proposed project will not cause any impairment of visibility at Point Reyes National Seashore, the closest Class I area.

Soils and Vegetation Analysis

The District has revised its Soils and Vegetation Analysis for the project to include additional information. The revised analysis covers potential impacts to soils and vegetation from PM2.5 emissions. As explained therein, the project is not expected to have any adverse impacts on soils and vegetation from PM2.5 or any other emissions.

Growth Analysis

The District conducted a growth analysis in its December 8, 2008, Air Quality Impact Analysis. The addition of PM2.5 to the Air Quality Impact Analysis does not alter the growth analysis.

CONCLUSIONS

The results of the air quality impact analysis indicate that the proposed project would not interfere with the attainment or maintenance of applicable AAQS for $PM_{2.5}$. The analysis was based on USEPA approved models and calculation procedures and was performed in accordance with 40 C.F.R. Section 52.21, Section 414 of the District's NSR Rule, and related guidance.

REVISED SOILS AND VEGETATION ANALYSIS FOR THE RUSSELL CITY ENERGY CENTER

July 27, 2009

The District's initial PSD Air Quality Impact Analysis of December 8, 2008, contained a Soils and Vegetation Analysis that concluded that the facility will not have any adverse impacts on soils and vegetation. The District has revised its analysis based on new information. The District has also expanded the analysis to address PM2.5 impacts since EPA is no longer requiring permitting agencies to use PM10 as a surrogate for PM2.5. The District's revised analysis is described below.

Soils and Vegetation Analysis

A detailed soil inventory found in the project and impact area was prepared (Russell City Energy Center AFC, Vol. I, May, 2001 and Russell City Energy Center AFC Amendment No. 1 (01-AFC-7), November 2006.) The project will be located on a site consisting of artificially drained soils formed from alluvium. This land is naturally high in salts, and is not designated by the California Department of Conservation as Prime Farmland or Farmland of Statewide Importance. The project is located entirely within Reyes clay drained soil type series. These soils tend to be very deep, exhibit level to nearly level topography, and are poorly to very poorly drained clays formed in tidal flats. Other soils within 2 miles of the project include Danville silty clay, Sycamore silty loam, Willows clay, Clear Lake clay and Botella silty clay. Some project area soils (Clear Lake, Danville, and Willows) are considered prime farmland soils when found in open field or agricultural areas, but none of the project facilities cross these soils in any other context than land that is zoned and used as urban, industrial land.

A detailed vegetation inventory in the project and impact area is also presented in the Russell City Energy Center AFC, Vol. I, May, 2001 and in the Russell City Energy Center AFC Amendment No. 1 (01-AFC-7), November 2006. Coastal habitats along the eastern shore of San Francisco Bay include salt marshes, brackish sloughs, coastal prairies, and coastal sage scrub communities. Biological resources located in the hills east of Hayward and San Leandro include Lake Chabot and Anthony Chabot Regional Park, and Garin Regional Park. Ecosystems occurring in these areas include those commonly encountered in the foothills of the Coast Ranges, such as oak woodland and valley/foothill grassland. Biological habitats within the project area consist primarily of coastal salt marsh, brackish/freshwater marsh, salt production facilities (evaporation ponds), ruderal areas, and urban landscapes with horticultural trees and shrubs. The dominant vegetation types are annual grassland and seasonal wetland dominated by saltgrass (Distichlis spicata), and alkalai heath (Frankenia salina). The only sensitive plant community found within the project area is the northern coastal salt marsh habitat. Representative species found in the salt marsh community include pickleweed (Salicornia virginica), salt grass (Distichlis spicata), and alkali heath (Frankenia salina). The habitat potentially affected by the proposed project can be characterized as mixed-used industrial. Most of the properties are devoid of vegetation with the exception of scattered ruderal areas. The ruderal areas are highly disturbed and characterized with non-natived grasses and forbs. The project location does not included seasonal wetlands or other potential federal-listed vernal pool branciopod habitats. Much of the historic salt marsh community within 1 mile of the site has been altered or eliminated by urban development, sewage treatment facilities, salt evaporation ponds, and the construction of dikes and levees to prevent flooding and intrusion of saltwater. Remaining salt marsh in the project impact area includes Cogswell Marsh, managed by the East Bay Regional Park District, the Hayward Area Recreation District (HARD) marsh restoration project, and several brackish/freshwater marshes. There are no economically important terrestrial wildlife species within the impact area of the proposed project. Special environmental areas within a 1-mile radius of the project site include Cogswell Marsh, managed by the East Bay Regional Park District, the HARD marsh restoration project and Shoreline Interpretive Center, and a small section of Mt. Eden Creek.

A botanical survey was originally taken of the original proposed project location in 2001. Table I lists the plant species observed at this location. The botanical survey was then updated in September 2006 at the newly proposed project relocation site, 1300 feet northwest of the previously proposed project site. Table II lists the plants inventoried during the September 2006 survey at the proposed project location,

TABLE I

Plant species observed during the 2001 botanical surveys at the original Project location

Family	Genus	Species/ subspecies/ variety	Common name
DICOTS			
Apiaceae	*Foeniculum*	*vulgare*	Fennel
Asteraceae	*Conyza*	*canadensis*	Horseweed
	Baccharis	*pilularis*	Coyote brush
	Cotula	*coronopifolia*	Brassbuttons
	Grindelia	*Stricta* var. *angustifolia*	Gumweed
	Sonchus	*oleraceus*	Common sow thistle
Brassicaceae	*Brassica*	*nigra*	Black mustard
Chenopodiaceae	*Chenopodium*	*album*	Lamb's quarters
	Salicornia	*virginica*	Pickleweed
Fabaceae	*Lathyrus*	*Sp.*	Wild pea
Frankeniaceae	*Frankenia*	*salina*	Alkali heath
Geraniaceae	*Geranium*	*molle*	Wild geranium
	Erodium	*cicutarium*	Filaree
Malvaceae	*Malva*	*nicaeensis*	Bull mallow
Myrtaceae	*Eucalyptus*	*globulus*	Blue gum
Papaveraceae	*Eschscholzia*	*californica*	California poppy
Plantaginaceae	*Plantago*	*lanceolata*	English plantain
Polygonaceae	*Rumex*	*crispus*	Curly dock
Primulaceae	*Anagallis*	*arvensis*	Scarlet pimpernell
Solanaceae	*Nicotiana*	*glauca*	Tree tobacco
Urticaceae	*Urtica*	*urens*	Dwarf nettle
MONOCOTS			
Poaceae	*Avena*	*fatua*	Wild oat
	Bromus	*diandrus*	Ripgut grass
	Cortadaria	*Sp.*	Pampas grass
	Cynodon	*dactylon*	Bermuda grass
	Distichlis	*spicata*	Saltgrass

Family	Genus	Species/ subspecies/ variety	Common name
	Elymus	*sp.*	Wild-rye
	Hordeum	*murinum* ssp. *leporium*	--
	Lolium	*multiflorum*	Italian ryegrass
	Vulpia	*microstachys*	Three-week fescue
Juncaceae	*Scirpus*	*sp.*	Rush

TABLE II

Plant species observed during the 2006 botanical surveys at the revised Project location, 1300 northwest of the original Project.

Common Name	Scientific Name
Wild oat	*Avena fatua*
Italian ryegrass	*Lolium multiflorum*
Foxtail barley	*Hordeum murinum ssp. leporinum*
Bermuda Grass	*Cynodon dactylon*
Smilo grass	*Piptatherum miliaceum*
Pampas grass	*Cortaderia sp.*
Bristly ox-tongue	*Picris echioides*
Bindweed	*Convolvulus arvensis*
Coyote brush	*Baccharis pilularis*
Wild mustard	*Brassica sp.*
Mallow	*Malva neglecta*
Curly dock	*Rurnex crispus*
Slender tarweed	*Madia gracillis*
Fennel	*Foeniculum vulgare*
Fireweed	*Epilobium sp.*
Scattered nut sedge	*Cyperus sp.*
Eucalytpus	*Eucalyptus globulus*
Himalayan blackberry	*Rubus discolor*
Cattail	*Typha sp.*
Tule	*Schoenoplectus acutus*
Bulrush	*S. robustus*

The 2001 analysis conducted for the 2001 AFC indicated that, at that time, 14 special-status plant species had the potential to occur in the project area. A new California Department of Fish and Game California Natural Diversity Data Base search conducted for the new Project location resulted in two additions to this list. In addition, 8 of the species on the 2001 list are not present on the 2006 list. Table III contains a list of the special status plants potentially occurring within the Project area.

As shown in the District's initial PSD Air Quality Impact Analysis of December 8, 2008, the project maximum one-hour average NO_2, including background, is 260 $\mu g/m^3$. This concentration is below the California one-hour average NO_2 standard of 338 $\mu g/m^3$. Nitrogen dioxide is potentially phytotoxic, but generally at exposures considerably higher than those resulting from most industrial emissions. Exposures for several weeks at concentrations of 280 to 490 $\mu g/m^3$can cause decreases in dry weight and leaf area, but 1-hour exposures of at least 18,000 $\mu g/m^3$ are required to cause leaf damage. The maximum annual RCEC NO_2 impact is 0.16 $\mu g/m^3$. The maximum annual NO_2 background at the Fremont monitoring station between 2005 and 2007 was in 2005 at 28.2 $\mu g/m^3$. The total annual NO_2 concentration (project plus background) of 28.4 $\mu g/m^3$ is far below these threshold limits (219.0 $\mu g/m^3$). In addition, the total predicted maximum 1-hour NO_2 concentrations of 260 $\mu g/m^3$ would be significantly less than the 1-hour threshold (7,500 $\mu g/m^3$ or 3,989 ppm) for 5 percent foliar injury to sensitive vegetation (USEPA 1991, "Air Quality criteria for oxides of nitrogen").

TABLE III

Special Status Plants Potentially Occurring Within the Project Area

Common Name	*Scientific Name*
Alkali milk-vetch	*Astragalus tener var. tener*
Brittlescale	*Atriplex depressa*
Big-scale balsamroot	*Balsamohriza macrolepis var. macrolepis*
Point Reyes bird's-beak	*Cordylanthus maritimus ssp. Palustris*
Hispid bird's beak	*Cordylanthus mollis ssp. Hispidus*
Fragrant fritillary	*Fritillaria liliacea*
Diablo rock rose	*Helianthella castanea*
Congdon's tarplant	*Hemizonia parryi ssp. Congdonii*
Kellog's horkelia	*Horkelia cuneata ssp. Sericea*
Contra Costa goldfields	*Lasthenia conjugens*
Delta tule pea	*Lathyrus jepsonii*
Mason's lilaeopsis	*Lilaeopsis masonii*
Hairless popcorn flower	*Plagiobothrys glaber*
California seablite	*Suaeda californica*
Robust spineflower	*Chorizanthe robusta var. robusta*
Adobe sanicle	*Sanicula maritime*

Plants metabolize and produce carbon monoxide (CO). Soil microorganisms probably act as a buffering system and sink for CO. There are no known detrimental effects on plants due to CO concentrations of 10,000 to 230,000 $\mu g/m^3$, much higher than the RCEC 1 -hour impact of 1574 $\mu g/m^3$ (USEPA 1979, "Air Quality criteria for carbon monoxide").

A variety of plant species were exposed to CO at concentrations of 115,000 $\mu g/m^3$ to 11,500,000 $\mu g/m^3$ from 4 to 23 days (Zimmerman et al.1989, "Polymorphic regions in plant genomes detected by an M13 probe", *Genome* 32: 824-828). While practically no growth retardation was noted in plants exposed at the lower level, retarded stem elongation and leaf deformation were observed at the higher concentrations. Pea and bean seedlings also exhibited abnormal leaf formation after exposure to CO at 27,000 $\mu g/m^3$ for several days (USEPA 1979, "Air Quality criteria for carbon monoxide"). Comparatively low levels of CO in the soil have been shown to inhibit nitrogen fixation. Concentrations of 113,000 $\mu g/m^3$ have been shown to reduce nitrogen fixation, while 572,000 to 1,142,000 $\mu g/m^3$ result in nearly complete inhibition (USEPA 1979, "Air Quality criteria for carbon monoxide"). The maximum 1-hour and 8-hour CO impacts from the RCEC project and are significantly lower: the 1-hour CO concentration is 1574 $\mu g/m^3$ and the 8-hour CO concentration is 321 $\mu g/m^3$.

The deposition of airborne particulates (PM_{10}) can affect vegetation through either physical or chemical mechanisms. Physical mechanisms include the blocking of stomata so that normal gas exchange is impaired, as well as potential effects on leaf adsorption and reflectance of solar radiation. Deposition rates of 365 g/m^2/year have been shown to cause damage to fir trees, but rates of 274 g/m^2/year and 400-600 g/m^2/year did not damage vegetation at other sites (Lerman, S.L. and E.F. Darley. 1975. Particulates, pp. 141-158. In: Responses of plants to air pollution, edited by J.B. Mudd and T.T. Kozlowski. Academic Press. New York.) The maximum annual predicted concentration for PM_{10} from the RCEC is 0.72 μg/m^3. Assuming a deposition velocity of 2 cm/sec (worst-case deposition velocity, as recommended by the California Air Resources Board [CARB]), this concentration converts to an annual deposition rate of 0.45 g/m^2/year, which is several orders of magnitude below that which is expected to result in injury to vegetation (i.e., 365 g/m^2/year). The addition of the maximum predicted annual particulate deposition rate for the RCEC to three-year maximum background concentration of 19.6 μg/m^3, measured at the nearest monitoring station (Fremont) yields a total estimated particulate deposition rate of 12.8 g/m^2/year, utilizing the same 2 cm/sec deposition velocity. This total is still approximately one order of magnitude less than levels expected to result in plant injury.

EPA has established a screening procedure for determining impacts to plants, soils and animals (EPA 450/2-81-078, "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals," December 1980). Table 3.1 of this EPA guidance document lists screening concentrations for various pollutants, representing minimum concentrations at which adverse growth effects or tissue injuries were reported in the scientific literature. Shown in Table IV below is a comparison of the screening concentrations from the EPA document and the impacts from RCEC.

TABLE IV

Screening Assessment of RCEC impacts on soils and vegetation

Pollutant	Screening concentration[a] (μg/m^3)	Averaging period	Max. modeled impact (μg/m^3)	3-yr max. Fremont background concentration (μg/m^3)	Maximum concentration (impact plus background) (μg/m^3)	Averaging period for comparison
NO_2	3,760	4-hour	130	130	260	1-hour
	3,760	8-hour	130	130	260	1-hour
	564	1 month	130	130	260	1-hour
	94	1 year	0.16	28.2	28.4	annual
CO	1,800,000	Week	628	2245	2,873	8-hour

[a]EPA 450/2-81-078, "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals," December 1980.

The deposition of airborne particulates ($PM_{2.5}$) can affect vegetation through either physical or chemical mechanisms. Physical mechanisms include the blocking of stomata so that normal gas exchange is impaired, as well as potential effects on leaf adsorption and reflectance of solar radiation. Deposition rates of 365 g/m^2/year have been shown to cause damage to fir trees, but rates of 274 g/m^2/year and 400-600 g/m^2/year did not damage vegetation at other sites (Lerman, S.L. and E.F. Darley. 1975. Particulates, pp. 141-158. In: Responses of plants to air pollution, edited by J.B. Mudd and T.T. Kozlowski. Academic Press. New York.) The maximum annual predicted concentration for $PM_{2.5}$ from the RCEC and the background sources is 1.06 μg/m3 (from Table VI). Assuming a maximum deposition velocity of 2 cm/sec (Sehmel, G. A., 1980:

Particle and gas dry deposition: a review. Atmos. Environ., 14, 981-1011.), this concentration converts to an annual deposition rate of 0.67 g/m^2/year, which is several orders of magnitude below that which is expected to result in injury to vegetation (i.e., 365 g/m^2/year). The addition of the maximum predicted annual particulate deposition rate for the RCEC to three-year average background concentration of 9.5 μg/m^3, measured at the Fremont-Chapel Way monitoring station yields a total estimated particulate deposition rate of 6.7 g/m^2/year, utilizing the same 2 cm/sec deposition velocity. This total is still roughly 35 times less than levels expected to result in plant injury.

Additional modeling was performed to evaluate the potential effects of nitrogen deposition from the proposed project on federally listed species or serpentine associated species that may be present in the East Bay Regional Park District (EBRPD). Attachment A – "Russell City Energy Center: Nitrogen Deposition at East Bay Regional Parks- February 24, 2009", contains a full report of the nitrogen deposition analysis for the proposed project. Serpentine-derived soils in the San Francisco Bay Area support native grassland plant communities that provide habitat for rare and endemic species that are adapted to nutrient-poor soils. Increased nitrogen levels may encourage non-native annual grasses to out-compete native species (California Energy Commission, 2007. Final Staff Assessment, City of Hayward Eastshore Energy Center Application for Certification (06-AFC-6). November.).

The USEPA models AERMOD and CALPUFF were used in the analysis. Wet and dry nitrogen species deposition rates were calculated for identified habitat areas. The identified areas were Hayward Regional Shoreline, Garin/Dry Creek Pioneer Regional Park, Redwood Regional Park, and the Lake Chabot Regional Park. The following listed or serpentine associated species are known to or could potentially occur in or near these parks: California clapper rail, salt marsh harvest mouse, western snowy plover, and California least tern at Hayward Regional Shoreline; and California red-legged frog, California tiger salamander, and serpentine associated plants, including Presidio clarkia and most beautiful jewel-flower at Garin/Dry Creek Pioneer, Redwood, and Lake Chabot Regional Parks.

Annual nitrogen deposition rates modeled for areas potentially occupied by the selected species range from 0.02 to 0.37 kg/ha/yr. No records of the selected species were found within Lake Chabot Regional Park. The highest annual nitrogen deposition rate modeled for areas within this park is approximately 0.03 kg/ha/yr. A value of 5 kg/ha/yr is often used as a screening value for comparing nitrogen deposition among plant communities although a threshold at which harmful effects from nitrogen deposition on plant communities has not been firmly established (California Energy Commission, 2007, Final Staff Assessment, City of Hayward Eastshore Energy Center Application for Certification (06-AFC-6). November)

CONCLUSIONS

Maximum project NO_2, CO, PM_{10} and $PM_{2.5}$ concentrations would be less than the threshold levels at which scientific studies have shown a potential for negative impacts on soils and vegetation. The proposed project is not expected to have any adverse soils and vegetative impacts.

PM2.5 PSD SOURCE IMPACT ANALYSIS
(Revised July 30, 2009)

For the:

Russell City Energy Center Draft Prevention of Significant Deterioration (PSD) Permit

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PM2.5 Source Impact Analysis

Localized cumulative source impacts from the Russell City Energy Center (RCEC) were assessed for particulate matter with an aerodynamic diameter of 2.5 microns or less (PM2.5). The cumulative multisource modeling analysis focused on the proposed RCEC project combined with mobile PM2.5 emissions from Highway 92, located just south of the project site, along with PM2.5 emissions from permitted sources within six (6) miles of RCEC. The analysis demonstrates that the emissions from RCEC will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) for PM2.5. If required, it would also demonstrate that the emissions from RCEC would not result in any exceedance of the lowest of EPA's proposed Class II increments for PM2.5. Further, it reviews the results of RCEC's earlier Class I impacts analysis to conclude that no impacts greater than the lowest of EPA's proposed Class I significant impact levels (SILs) are expected in either of Point Reyes National Seashore or Pinnacles National Monument.

1. ***Regulatory Context.*** This analysis was undertaken in response to the April 24, 2009 decision of the Administrator of the U.S. Environmental Protection Agency (EPA), Lisa P. Jackson, to grant a petition for reconsideration brought by EarthJustice on behalf of the Sierra Club and Natural Resources Defense Council concerning specific provisions in EPA's May 16, 2008 rule, *Implementation of New Source Review (NSR) Program for Particulate Matter Less than 2.5 Micrometers* (PM2.5), 73 Fed. Reg. 28321. In that decision, Administrator Jackson said that she intends to repeal the "grandfathering provision concerning the continued use of the PM10 Surrogacy Policy" for those federal PSD permit applicants completed prior to July 15, 2008 (as codified at 40 CFR 52.21(i)(l)(xi)) because it had been promulgated without public comment. She also stayed the effectiveness of this provision for three months pending consideration.

In its December 2008 *Statement of Basis for Draft Amended Federal Prevention of Significant Deterioration Permit for RCEC* (*Statement of Basis*), the Bay Area Air Quality Management District (Air District) relied upon the PM10 Surrogacy Policy for purposes of demonstrating compliance with the requirement to conduct an air quality impacts analysis (AQIA).[1] As a consequence of Administrator Jackson's April 24, 2009 decision, that analysis would no longer satisfy federal PSD requirements with respect to PM2.5.

2. ***PSD Source Impact Analysis.*** Under EPA's PSD regulations, an applicant must conduct a "source impact analysis", which demonstrates that "allowable emission increases from the source in conjunction with all other applicable emissions increases or reductions (including secondary emissions), would not cause or contribute to air pollution in violation of: (1) Any NAAQS in any region; or (2) Any applicable maximum allowable increase over the baseline concentration in any area." 40 CFR § 52.21(k).

Subparagraph (1) is required to assure that the source's emissions will not cause a violation of the NAAQS, which, in this case, consist of the 24-hour and annual PM2.5 standards of 35 $\mu g/m^3$ and 15 $\mu g/m^3$, respectively. Subparagraph (2) is the "increment consumption analysis", which assures that, in those locations currently meeting the federal NAAQS (*i.e.*, those deemed "attainment" or "unclassifiable"), the concentration

[1] *See* Statement of Basis, at 17-18, 86-88.

of a given pollutant cannot increase by an amount greater than the "maximum allowable increase" specified by the Clean Air Act and/or the PSD regulations for the particular pollutant.

3. ***Role of Significant Impact Levels.*** For purposes of the PSD program, EPA has traditionally applied "significant impact levels" ("SILs") as a *de minimis* value, which represents the offsite concentration predicted to result from a source's emissions that does not warrant additional analysis or mitigation.[2]

If a source's modeled impact at any offsite location exceeds the relevant SIL, the source owner must then conduct a "multi-source" (or "cumulative") air quality analysis to determine whether or not the source's emissions will cause or contribute to a violation of the relevant NAAQS or applicable PSD increment.

While EPA has not promulgated any final SILs or PSD increments for PM2.5 at this time, in 2007, EPA proposed three options for establishing PM2.5 SILs and increments. *September 21, 2007 Proposed Rule*, 72 Fed. Reg. 54112. As a conservative measure, RCEC applied the lowest (*i.e.*, most stringent) of each of the three proposals for both the Class II and Class I SILs and increments, as shown in Table 1 below.

Table 1
Lowest of Proposed PSD Ambient Significance Levels and Increments

Pollutant/ Avg. Period		Class II SIL ($\mu g/m^3$)	Class II Increment ($\mu g/m^3$)	Class I SIL ($\mu g/m^3$)	Class Increment ($\mu g/m^3$)
PM2.5	- 24-hour	1.2	9	0.07	2
	- Annual	0.3	4	0.04	1

4. ***NAAQS Compliance Demonstration.*** To demonstrate that the emissions from the proposed RCEC will not cause or contribute to a violation of the PM2.5 NAAQS, a multi-source cumulative modeling analysis was conducted in accordance with EPA

[2] *See, e.g., Prevention of Significant Deterioration (PSD) for Particulate Matter Less than 2.5 Micrometers (PM2.5) – Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC); Proposed Role,* 72 Fed. Reg. 54112, at 54138 (September 21, 2007) (hereinafter, "*September 21, 2007 Proposed Rule*") ("Based on EPA interpretations and guidance, SILs have also been widely used in the PSD program as a screening tool for determining when a new major source or major modification that wishes to locate in an attainment or unclassifiable area must conduct a more extensive air quality analysis to demonstrate that it will not cause or contribute to a violation of the NAAQS or PSD increment in the attainment or unclassifiable area."); 72 Fed. Reg. at 54139 ("The EPA considers a source whose individual impact falls below a SIL to have a *de minimis* impact on air quality concentrations. Thus, a source that demonstrates its impact does not exceed a SIL at the relevant location is not required to conduct more extensive air quality analysis or modeling to demonstrate that its emissions, in combination with the emissions of other sources in the vicinity, will not cause or contribute to a violation of the NAAQS at that location.")

requirements[3] This analysis considered both the existing background concentrations, as established by ambient monitoring data,[4] and the contribution from additional sources, which might not be reflected by the monitoring data, but could interact with the facility's potential impacts.

5. ***Preconstruction Monitoring Data.*** EPA's PSD regulations require an applicant to provide preconstruction monitoring data for purposes of use in the Source Impacts Analysis.[5] However, a source is exempt from this requirement if its modeled impact in any area is less than pollutant-specific "significant monitoring concentrations" ("SMC"), which EPA has generally established as five times the lowest detectable concentration of a pollutant that could be measured by available instrumentation.[6] In its *September 21, 2007 Proposed Rule*, EPA proposed three options for establishing PM2.5 SMCs, as shown in the following Table 1A.

TABLE 1A[7]
EPA's Proposed Significant Monitoring Concentrations for PM2.5

Option Number	Basis	Proposed Level
1	5-times lowest detectable 24-hour average concentration for PM2.5 (2.0 $\mu g/m^3$) (40 CFR Part 50, App. L, § 3)	10 $\mu g/m^3$
2	Existing PM10 SMC (10 $\mu g/m^3$), times ratio of PM2.5 to PM10 emissions (0.8)	8.0 $\mu g/m^3$
3	Existing PM10 SMC (10 $\mu g/m^3$) times ratio of PM2.5 24-hr NAAQS to PM10 24-hr NAAQS (0.233)	2.3 $\mu g/m^3$

[3] *Guideline on Air Quality Models,* 40 CFR Pt. 51, App. W, § 7.2.1.1.a.The PSD regulations require that all "estimates of ambient concentrations" must be based "on applicable air quality models, data bases, and other requirements specified in appendix W of part 51 of this chapter (*Guideline on Air Quality Models*)." 40 CFR § 52.21(l).

[4] *See Guideline on Air Quality Models,* 40 CFR Pt. 51, Appendix W (App. W), § 7.2.1.1.a. According to Appendix W, "[t]ypically, air quality data should be used to establish background concentrations in the vicinity of the source(s) under consideration". *Id.* § 8.2.1.b For comparison with the 24-hour PM2.5 NAAQS, the background concentration is based on the average of the 98th percentile 24-hour values measured over the last three years of available data. *Id.*, § 10.1.c. For the annual PM2.5 NAAQS, the background is established by the three year average of the annual averages.

[5] *See* 42 U.S.C. § 7475(e)(2); 40 CFR § 52.21(m)(1).

[6] *See September 21, 2007 Proposed Rule,* 72 Fed. Reg. at 54141. ("The EPA promulgated values that represented five times the lowest detectable concentration in ambient air that could be measured by the instruments available for monitoring pollutants... The EPA chose the factor of five after reviewing test data for various methods and considering instrument sensitivity, potential for sampling error, instrument variability, and the capability to read recorded data.")

[7] *Id.*

Even if a source's potential impacts exceeds the corresponding SMC, and the applicant must therefore provide preconstruction monitoring data as part of its Source Impact Analysis, that does not necessarily mean the applicant must install and operate a new monitor at the project site. Rather, according to EPA guidance, an applicant may satisfy the preconstruction monitoring obligation in one of two ways[8]: (i) Where existing ambient monitoring data is available from representative monitoring sites, the permitting agency may deem it acceptable for use in the Source Impacts Analysis;[9] or (ii) where existing, representative data are not available, then the applicant must obtain site-specific data.[10]

As a general matter, the permitting agency has substantial discretion "to allow representative data submissions (as opposed to conducting new monitoring) on a case-by-case basis."[11] In determining whether existing data are representative, EPA guidance has emphasized consideration of three factors: monitor location, data quality and currentness of the data.[12] The permitting agency also may approve use of data from a representative "regional" monitoring site for purposes of the NAAQS compliance demonstration.[13]

While the maximum offsite impact modeled to occur from RCEC (4.86 ug/m^3) is below two of EPA's proposed Significant Monitoring Concentrations ("SMCs"), it would exceed the lowest of the three proposed SMCs. Accordingly, RCEC has proposed existing monitoring data from nearby Fremont, CA to satisfy the preconstruction

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[8] *See Ambient Monitoring Guidelines for Prevention of Significant Deterioration, U.S. EPA Office of Air Quality Planning and Standards*, EPA-450/4-87-007, May 1987 ("*PSD Monitoring Guidelines*"), at § 2.1. ("It should be noted that the subsequent use of 'monitoring data' refers to either the use of existing representative air quality data or monitoring the existing air quality.")

[9] *New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting*, Draft 1990 ("*Draft NSR Workshop Manual*"), at C.18. ("Once a determination is made by the permitting agency that ambient monitoring data must be submitted as part of the PSD application, the requirement can be satisfied in one of two ways. First, under certain conditions, the applicant may use existing ambient data. To be acceptable, such data must be judged by the permitting agency to be representative of the air quality for the area in which the proposed project would construct and operate.")

[10] *Id.*, at C.19.

[11] *In re Kawaihae Cogeneration Project*, 7 Environmental Administrative Decisions ("E.A.B.") 107, 128 (U.S. EPA Environmental Appeals Board, April 28, 1997) (denying review of claim that permitting agency should have required site-specific monitoring for pollutants exceeding the significant monitoring concentrations based on EPA guidance and an earlier decision in *In re Hibbing Taconite Co.*, 2 E.A.D. 838, 851 (EPA Administrator 1989), cited for the proposition that "monitoring guidelines 'are very broad and leave much to the discretion of the permitting authority'").

[12] *Id.; see also PSD Monitoring Guidelines*, at § 2.4.

[13] *Draft NSR Workshop Manual*, at C.18 ("It is generally preferable to use data collected within the area of concern; however, the possibility of using measured concentrations from representative 'regional' sites may be discussed with the permitting agency.")

monitoring requirement. The BAAQMD maintains air quality and meteorological monitoring stations throughout the entire air basin with sufficient resolution to adequately determine representative background concentrations for attainment/nonattainment determinations. Unlike air toxics or certain criteria pollutants (*e.g.*, carbon monoxide), PM2.5 generally occurs as a regional pollutant in the Bay Area. In a case such as this, where the Air District maintains an extensive network of monitoring stations validated to meet the relevant federal reference methods, the applicant and permitting agency may rely upon the robust data set generated by the monitoring network for purposes of the NAAQS compliance demonstration.

In discussions with Air District personnel, RCEC has proposed the Fremont monitoring data as adequately representative of the conditions at the project site. This monitoring location has been classified as a "population oriented" monitor and designated for collection of PM2.5 data "because light winds combined with surface based-based [sic] inversions during the winter months can cause elevated particulate levels." *2008 Air Monitoring Network Plan,* To be Submitted: July 1, 2009, at 31. Similar conditions affecting PM2.5 concentrations are expected to occur within the vicinity of the project site.

In addition, the Fremont monitoring station is the closest within the Bay Area's monitoring network for which at least three years of PM2.5 monitoring data are available, as required for purposes of the NAAQS compliance demonstration: the 24-hr design value is based on the three-year average of the 98th percentile of daily average concentrations, while the annual design value is the three year average of annual averages.[14] As suggested, the Fremont monitor has collected a complete set of validated, PM2.5 data. According to the Air District's *2008 Air Monitoring Network Plan,* "[t]he national 24-hour PM2.5 standard of 35 $\mu g/m^3$ was exceeded on four days in the last 3 years." *2008 Air Monitoring Network Plan,* To be Submitted: July 1, 2009, at 31.

In contrast, the closest monitoring station in the other direction (to the north of the project site) that has collected PM2.5 monitoring data is classified as a "Special Purpose Monitor" (SPM) and has only been collecting data since November 2007. *Id.*, 97-98. As a consequence, the data set would be inadequate for the Source Impact Analysis' determination of whether or not RCEC's emissions of PM2.5 would cause or contribute to an exceedance of the PM2.5 NAAQS.

For the summer months, when RCEC's contributions are the highest, the 98th percentile of average daily concentrations recorded by the Fremont monitoring station is approximately 21 $\mu g/m^3$, as a daily (24-hour) average; for winter months, when exceedances are likely to occur throughout the Bay Area, it is approximately 29 $\mu g/m^3$. As a conservative measure, RCEC has applied the higher background concentration for all modeled periods. For the annual average, the background concentration is approximately 9.5 $\mu g/m^3$.

RCEC representatives have discussed and agreed upon the representativeness of the data set from the Fremont monitor for purposes of the Source Impacts Analysis.

[14] *See* 40 CFR Pt. 51, App. W, § 10.1.c. ("Standards for fine particulate matter (PM-2.5) are expressed in terms of both long-term (annual) and short-term (daily) averages. The long-term standard is calculated using the three year average of the annual averages while the short-term standard is calculated using the three year average of the 98th percentile of the daily average concentration.")

Further, to the extent these data may not reflect the influence of nearby sources which might interact with RCEC's impacts to cause an exceedance of the NAAQS (*e.g.*, motor vehicle traffic on State Highway 92 and 29 additional stationary sources permitted by the Air District since 2007 located within a 6-mile perimeter around the project site), RCEC has modeled additional contributions from those sources and included those contributions in its cumulative impacts analysis, as described below.

If, after adding in the background concentration, the modeled contribution from the source and any other modeled sources, the result is less than the relevant NAAQS at all locations, then no violation would occur and the cumulative impacts analysis is complete. If a violation is predicted by the model, the source may still demonstrate that it does not "cause or contribute to" a violation of the NAAQS by demonstrating that its own contribution is lower than the SIL at the particular location and time of the modeled violation.[15] This is referred to as a culpability analysis.

*6. **PSD Increment Consumption Analysis.*** As described above, EPA has not yet promulgated final PSD increments for PM2.5. Upon promulgating the final NSR implementation rule for PM2.5, EPA said that, "[a] demonstration that a source does not cause or contribute to a violation of the PM2.5 NAAQS can be conducted notwithstanding the absence of an increment for PM2.5."[16] As indicated previously, a source owner must demonstrate that its emissions would not cause or contribute "[a]ny applicable maximum allowable increase over the baseline concentration in any area" 40 CFR § 52.21(k); *see also* 42 U.S.C. § 7475(a)(3)(A). In the absence of any maximum allowable increase, no increment consumption analysis is required.

Even if such an analysis were required at this time, the modeling analysis described herein would also demonstrate that RCEC's emissions will not cause or contribute to any exceedance of EPA's proposed PM2.5 Class II increments of 9 $\mu g/m^3$ for the 24-hour standard and 4 $\mu g/m^3$ for the annual standard. The highest annual and 24-hour concentrations indicated at any offsite location were 0.529 and 4.86 $\mu g/m^3$, respectively.

When it proposed these increments in 2007, EPA proposed a number of options for establishing the "trigger date" for PM2.5, but said that its preference was to follow the example it set upon promulgating NO_2 increments in 1988 and "reset" the trigger date (hence, the baseline for purposes of the increment consumption analysis) at the time of the rule's issuance.[17] EPA said this approach would be more protective and also was

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[15] *Draft NSR Workshop Manual*, Draft October 1990, at C.52 ("The source will not be considered to cause or contribute to the violation if its own impact is not significant at any violating receptor at the time of each predicted violation.")

[16] *Implementation of the New Source Review (NSR) Program for Particulate Matter Less than 2.5 Micrometers in Diameter (PM2.5)*, Response to Comments (hereinafter, "*Implementation Rule Response to Comments*"), U.S. EPA, Office of Air Quality Policy and Standards, Air Quality Policy Division, New Source Review Group, March 2008, at 82.

[17] *See September 21, 2007 Proposed Rule*, at 54136. ("Specifically, we are proposing that the major source baseline date and trigger date, both fixed dates, will be defined as the effective date of this rule after promulgation... EPA's judgment is that starting with new baseline dates on or after the effective date of this rule would make the new PSD increments more protective. Under our

justified under the Clean Air Act because PM2.5 constitutes a "new pollutant", and not a revision of an existing criteria pollutant; as a consequence, EPA said the baseline date for purposes of PM2.5 need not be tied to the historic baseline dates for either total suspended particulate or PM10. This approach has been endorsed by many parties which commented on the proposed rule, including consortia of state and local permitting agencies.[18]

If EPA should promulgate a new "trigger date" for PM2.5, RCEC's application could be deemed the first completed PSD application received after the trigger date and would, consequently, trigger both the minor source baseline date and major source baseline date.[19] In light of this, RCEC would not need to consider any other stationary sources for purposes of its increment consumption analysis , unless such sources had increased their emissions since the date when RCEC's application was complete. Because the highest modeled concentrations from RCEC are significantly below the lowest of the proposed Class II increments, RCEC could not possibly be found to cause or contribute to an exceedance of a PSD increment.[20] However, as suggested previously, no increment consumption analysis is currently required under the PSD regulations because, at this time, no increment has been established for PM2.5.

Modeling for PM2.5

To satisfy the requirement to evaluate the potential source impacts, dispersion modeling was conducting using the AERMOD model. The detailed modeling procedures, model

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proposed approach, any emissions reductions occurring prior to the effective date of this rule would be counted toward the baseline concentration rater than expanding the PM2.5 increment.")

[18] *See* letter, Northeastern States for Coordinated Air Use Management, to Docket ID No. EPA-HQ-OAR-2006-0605, Re: *NESCAUM Comments on EPA's Proposed Rule: Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5)–Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC). 72 Federal Register 54111, September 21, 2007*, December 13, 2007; letter from National Association of Clean Air Agencies to U.S. EPA Air and Radiation Docket, Re: Docket ID: EPA-HQ-OAR-2006-0605, January 17, 2008; available at: http://www.4cleanair.org/documents/PM25Increments.pdf.

[19] According to EPA's September 21, 2007 Proposed Rule, the minor source baseline date cannot occur prior to the "trigger date":

> The trigger date, as the name implies, triggers the overall increment consumption process nationwide. Specifically, this is a fixed date, which must occur before the minor source baseline data can be established for the pollutant-specific increment in a particular attainment area. *See, e.g.*, 40 CFR 52.21(b)(14)ii).

72 Fed. Reg. at 54117. *See also supra* at note 8.

As a consequence, no increases or decreases occurring since the time when RCEC initially submitted its application, but before the EPA's selected trigger date for PM2.5, would consume increment.

[20] Note that, for the 24-hour NAAQS, Appendix W instructs that the highest, second-highest increase in estimated concentration must be less than or equal to the relevant increment. 40 CFR Pt. 51, App. W, § 10.2.3.3.a.

options, and meteorological data used in the cumulative impacts dispersion analysis were the same as those used for the proposed facility as described in the AERMOD Modeling Assessment (September 2008).

Supporting information used in the analysis included the following:

- RCEC source's respective coordinate locations and worst-case stack parameters and emissions;
- Stack parameters for sources included in the cumulative air quality impacts dispersion modeling analysis; and
- Output files for the dispersion modeling analysis.

The same stack locations and building dimensions used for the facility modeling analyses were also used to assess downwash considerations for the emissions sources at the proposed

RCEC. Worst-case source conditions defined by the screening analyses in the facility modeling analyses for RCEC were used to define stack conditions analyzed. These conditions are shown below in Table 2.

Table 2 Stack Parameters and Emission Rates for RCEC Facility*

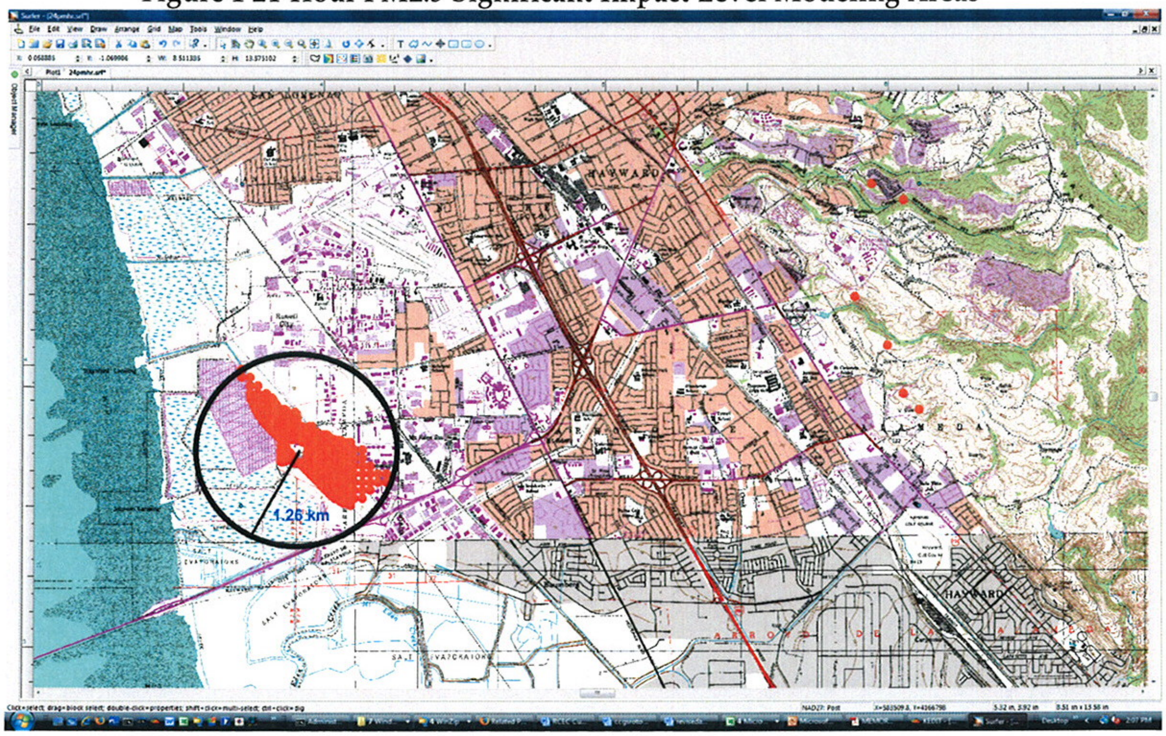
	Stack Height (meter)	Stack Diam. (meter)	Stack Temp (deg K)	Exhaust Velocity (m/s)	Emission Rates (g/s) for each turbine/HRSG and cooling tower cell PM2.5
Averaging Period: 24 hours					
Turbines/HRSGs	44.196	5.4864	350.68	14.075	0.945
Fire Pump Diesel Engine	4.572	0.1524	665.37	53.340	4.167E-4
Cooling Tower	18.288	9.7536	298.17	10.308	0.03066
Averaging Period: Annual					
Turbines/HRSGs	44.196	5.4864	356.83	21.655	0.8952
Fire Pump Diesel Engine	4.572	0.1524	665.37	53.340	5.936E-5
Cooling Tower	18.288	9.7536	300.27	10.308	0.02998

*PM2.5 emissions from the cooling tower were assumed to equal the PM10 emissions which are based on total TDS. No conversions were assumed.
deg K = degree Kelvin, g/s = grams per second, m/s = meters per second

RCEC 24-hour PM2.5 Significant Impact Level Modeling Results

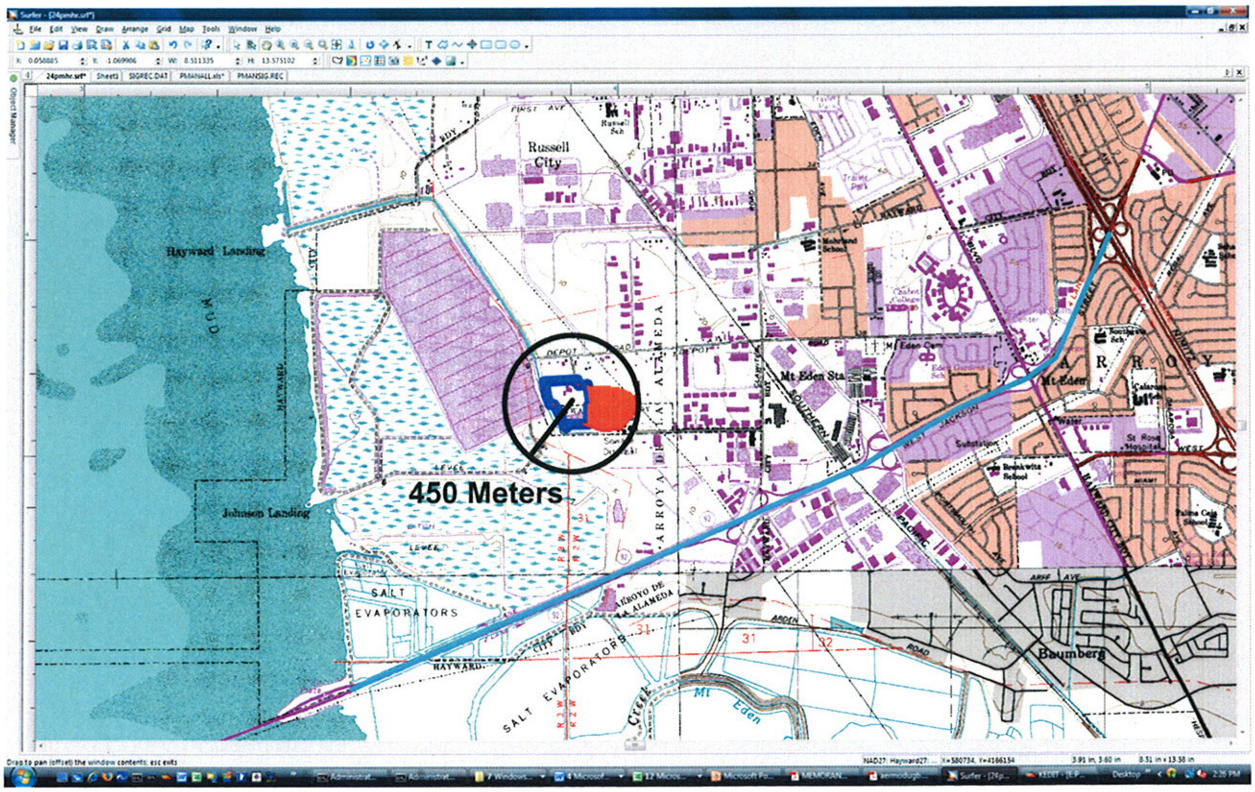
Emissions from the proposed project were modeled to determine the areal extent of the PM2.5 significance area for both the 24-hour and annual NAAQS. For purposes of these analyses, all total dissolved solids in the cooling tower were assumed to form PM2.5, which is a highly conservative assumption. Additionally, the emissions of PM2.5 from the turbine were based upon to the proposed emissions limit of 7.5 lb/hr PM10/ PM2.5 per gas turbine/HRSG train. The operation of the turbines and cooling tower were modeled with the assumption of 24-hours per day of emissions. The results of the SIL modeling analysis for locations that are greater than or equal to the 1.2 $\mu g/m^3$ SIL are presented in Figure 1 and 1a.

Figure 1 24-Hour PM2.5 Significant Impact Level Modeling Areas



A/73106494.1

Figure 1a Annual PM2.5 Significant Impact Level Modeling Area



1. ***Identification of Significant Impact Area and Nearby Sources for Consideration in Cumulative Impacts Analysis.*** EPA guidance prescribes use of the significant impact levels (SILs) to establish the "impact area", which is used to identify the appropriate geographic area in which a cumulative impacts analysis should be conducted according to EPA guidance, the "impact area" is identified by drawing a circle around the site with a radius equal to the distance to the farthest location where an exceedance of the SIL is modeled to occur.[21] This impact area is also used in a multi-source cumulative impacts

[21] According to EPA's Draft NSR Workshop Manual, the "impact area" is defined by taking farthest location of a modeled exceedance of the SIL and drawing a circle to that point, with the source located at the center:

> 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. This area includes all locations where the significant increase in the potential emissions of a pollutant from a new source, or significant net emissions increase from a modification, will cause a significant ambient impact (i.e., equal or exceed the applicable significant ambient impact level as shown in *Table C-4*). The highest modeled pollutant concentration for each averaging time is used to determine whether the source will have a significant ambient impact for that pollutant.

analysis to "guide the identification of other sources to be included in the modeling analyses."[22]

As illustrated by Figure 1, a majority of the significant impacts locations occurred within the immediate area of the project site. Most of these impacts were due to the cooling tower emissions and are based in part on the conservative assumptions used to calculate PM2.5 emissions from the cooling tower, *i.e.*, that all total dissolved solids in the cooling tower convert to PM2.5. The six (6) receptor locations in terrain eastward of the project site were due primarily to the turbines/HRSGs. According to EPA guidance, the impact area was established by taking the distance from the project site to the farthest of these locations and then drawing a circle with that distance as its radius. For the 24-hour PM2.5 standard, the impact area was determined to be approximately 8.1 kilometers in radius from the project site. For the annual PM2.5 standard, the impact area radius is 450 meters, as all significant impacts were immediately next to the project site.

Per EPA guidance, the larger impact area was then surveyed to identify other "nearby sources", which also should be included in the cumulative impacts analysis. Both Appendix W and the *Draft NSR Workshop Manual* require that the cumulative impacts analysis include "nearby sources", which includes "[a]ll sources expected to cause a significant concentration gradient in the vicinity of the source or sources under consideration." 40 CFR Pt. 51, App. W, §§ 8.2.3.b; 8.2.1.c; *Draft NSR Workshop Manual,* at C.32. Appendix W further instructs that the "impact of nearby sources should be examined at locations where interactions between the plume of the point source under consideration and those of nearby sources (plus natural background) can occur". 40 CFR Pt. 51, App. W, § 8.2.3.e. Emphasizing that "[t]he number of sources is expected to be small except in unusual situations", Appendix W leaves identification of nearby sources to the "professional judgment" of the permitting agency. *Id.*[23]

Based on the location of significant impacts illustrated by Figures 1 and 1a, RCEC, in consultation with BAAQMD representatives, considered the potential that other background sources within the impact area might produce a significant concentration gradient in the same location where RCEC's modeled impacts were at or above the SIL. As discussed above, a majority of these locations occur in the immediate vicinity of the

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> 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.

"*Draft NSR Workshop Manual,* at C.26 (emphasis in original).

[22] *Id.*, at C.31.

[23] The *Draft NSR Workshop Manual* further underscores the "flexibility" and "judgment" required to identify "nearby sources", as follows:

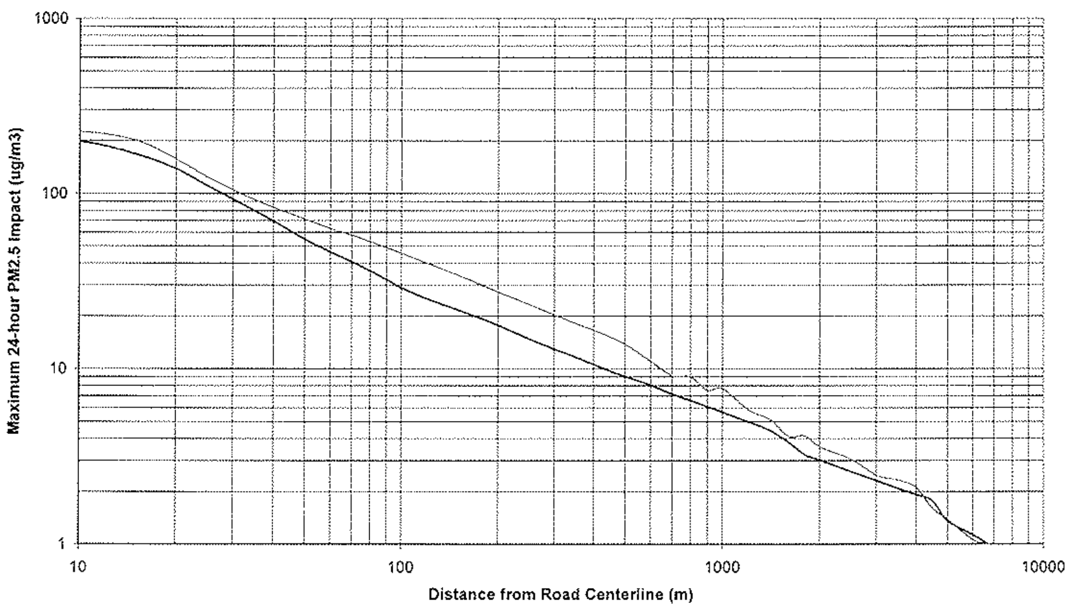
> In determining which existing point sources constitute nearby sources, the <u>Modeling Guideline</u> necessarily provides flexibility and requires judgment to be exercised by the permitting agency. Moreover, the screening method for identifying a <u>nearby</u> source may vary from one permitting agency to another. To identify the appropriate method, the applicant should confer with the permitting agency prior to actually modeling any existing sources.

Draft NSR Workshop Manual., at C.32 (emphasis in original).

project site. Given the proximity of Highway 92 to these modeled exceedances of the SIL, the BAAQMD identified traffic on certain lengths of Highway 92 as nearby sources, *i.e.*, sources whose emissions might cause a significant concentration gradient in the vicinity of the project's impacts.

To determine the potential of Highway 92 to produce a concentration gradient, receptors were placed at equidistant locations along the highway, near Clawiter and extended outwards from the highway up to 10,000 meters. AERMOD was then used to determine the concentration gradient, which is shown in Figure 2.

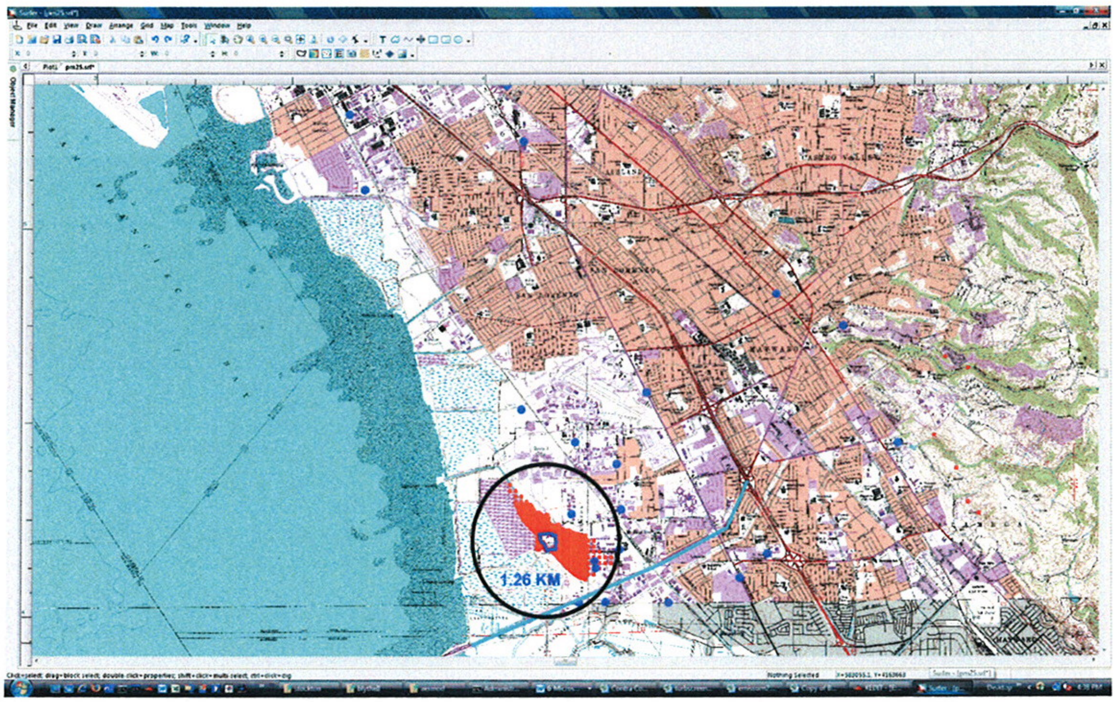
Figure 2
PM2.5 Sensitivity Analysis
Impact vs. Distance from Road for Middle Route 92 Segment (Clawiter->Industrial)



Based on the graphical results in Figure 2, a significant concentration gradient exists from the center of the highway outwards to distances up to 1000 meters from the source. Using the results of the significance modeling and the demonstration of the Highway 92 concentration gradient, the Air District provided emissions and highway length segment recommendations for use in the PM2.5 NAAQS modeling assessment. Figures 1a and 3 display the portions of Highway 92 that were included in the cumulative modeling assessment, which are outlined in light blue.

For the six (6) locations in elevated terrain to the east of the project site where RCEC's impacts were modeled above the 24 hour SIL, no additional sources were identified that would cause a significant concentration gradient in the vicinity of these impacts. The BAAQMD also provided a list of additional permitted sources from the beginning of 2007 to present. Although none of these additional sources was expected to cause a significant concentration gradient in the same location as RCEC's significant impacts, they were also included in the cumulative modeling analysis because, while already permitted, they may not yet be operational and thus, not reflected by the background monitoring data for PM2.5. The location of these additional sources is shown on Figure 3 by the violet dots. Together, with the area sources included from Highway 92 traffic (the length of which are shown on Figure 3 in light blue), these additional sources were added to the contribution from RCEC and the background monitored concentration to determine compliance with the NAAQS.

Figure 3 Additional Background Sources Included in the 24-hour and Annual NAAQS Modeling Assessment



NAAQS Dispersion Modeling Inputs

The Air District provided the emissions of PM2.5 from mobile sources based on model year 2007 car/truck vehicle mix and emission factor data, specific to Alameda County. Additionally, traffic count data based on average daily east and westbound traffic were provided for the following segments:

- San Ramon Road Interchange
- Palomares/Eden Canyon Road Interchange
- Crow Canyon Road/Center Street
- Redwood Road
- Strobridge Avenue
- Junction Route 238

The PM2.5 emission factors for Alameda county on-road motor vehicle fleet for calendar year 2007 in grams/mile are:

Exhaust:	0.039
Tire Wear:	0.002
Brake Wear:	0.006
Road Dust:	0.060
Total:	**0.107**

The typical traffic speed for the modeled sources was assumed to be 60 miles per hour and is only used in estimating the exhaust emission factor. These emissions were based on EMFAC2007 version 2.3. It should be noted that the road dust emission factor provided by the BAAQMD was for all roadway types, and not just freeways. Using the road dust factor for freeways reduces this emission rate to 0.040 grams/mile for a new total of 0.087 grams/mile. However, the modeling assessment used the higher emission factor. Highway 92 was modeled as six (6) area sources corresponding to the traffic count data provided by the Air District. Table 3 presents the area source parameters used in the cumulative NAAQS modeling.

Table 3 Stack Parameters and Emission Rates for Highway 92

	Location X (meters)	Location Y (meters)	Base Elevation (meters)	Release Height (meters)	Emission Rates (g/s/meter^2) for area sources PM2.5
Source ID					
ROAD11	575174.9	4163661.0	1.8	0.50	0.40890E-05
ROAD21	577656.1	4164753.0	6.0	0.50	0.44410E-05
ROAD22	578328.9	4165042.0	6.0	0.50	0.44410E-05
ROAD31	578602.1	4165209.5	9.0	0.50	0.43090E-05
ROAD41	579490.1	4165658.8	12.0	0.50	0.47930E-05
ROAD42	579684.1	4165837.2	15.8	0.50	0.47930E-05

Initial vertical dispersion, Sigma Z, was set to 0.0

In addition, the BAAQMD provided a list of 29 additional sources that were within six (6) miles of the RCEC project. These sources were permitted for construction and operation between January 2007 to present and therefore may not be adequately represented by the background PM2.5 monitoring data. Based upon this possibility, the 29 background sources were included in the NAAQS modeling analysis and are presented in Table 4.

Table 4 Stack Parameters and Emission Rates for BAAQMD Source Inventory

BAAQMD Source #s	Stack Height (meter)	Stack Diam. (meter)	Stack Temp (deg K)	Exhaust Velocity (m/s)	Emission Rates (g/s) for each source PM2.5
Averaging Period: 24 hours and Annual					
00167	9.144	0.761	377.59	4.15	4.488E-2
00698	2.134	0.152	750.37	46.94	5.753E-5
01009	3.658	0.215	752.59	211.02	2.877E-3
02099	2.591	0.089	768.71	95.23	5.753E-5
03576	7.010	0.555	588.71	3.13	1.395E-2
03933	3.170	0.203	772.59	35.82	1.151E-4
04784	9.144	0.761	377.59	4.15	2.129E-2
07215	4.267	0.101	761.48	187.67	2.877E-4
07688	9.144	0.761	377.59	4.15	5.638E-3
13930	2.134	0.127	799.26	49.68	5.753E-5
15959	4.267	0.203	755.93	52.77	5.753E-5
16441	3.511	0.168	761.48	68.31	2.301E-4

Table 4 Stack Parameters and Emission Rates for BAAQMD Source Inventory					
BAAQMD Source #s	Stack Height (meter)	Stack Diam. (meter)	Stack Temp (deg K)	Exhaust Velocity (m/s)	Emission Rates (g/s) for each source
					PM2.5
16451	2.591	0.076	740.37	56.29	2.301E-5
16947	3.353	0.203	779.82	42.14	9.493E-5
17548	6.096	0.510	422.04	4.96	1.070E-2
17553	7.925	0.356	1033.15	6.42	2.273E-3
17621	11.582	0.406	733.15	47.03	4.027E-4
17952	4.267	0.089	866.48	77.26	2.589E-5
18189	2.134	0.152	710.37	27.19	2.877E-5
18210	7.010	0.555	672.04	5.57	1.726E-3
18421	3.261	0.152	817.04	60.78	4.315E-5
18548	10.000	0.100	0.00	0.10	1.346E-2
18676	3.048	0.101	761.48	187.67	4.315E-5
18683	2.515	0.076	703.15	72.78	2.301E-5
19014	1.829	0.076	724.26	76.30	2.877E-5
19164	4.267	0.101	795.37	85.89	4.027E-5
19173	2.134	0.152	710.37	27.19	4.315E-5
19244	7.010	1.067	0.00*	11.09	1.640E-3
19583	3.511	0.168	761.48	4.15	5.753E-5

*Temperature set to ambient.
deg K = degree Kelvin, g/s = grams per second, m/s = meters per second

In addition to modeling the proposed project's impacts, along with the impacts from traffic on the identified sections of Highway 92 and the BAAQMD supplied source inventory, the 98th percentile background concentration of PM2.5 recorded by the Fremont, California monitoring station was also included for the 24-hour analysis. As suggested previously, Air District personnel agreed upon the representativeness of the Fremont monitoring data for purposes of this analysis. For the years 2006 through 2008, the 24-hour background is 29.0 μg/m^3. The annual background concentration was 9.5 μg/m3. These concentrations were then added to the modeling results, as described in the following section.

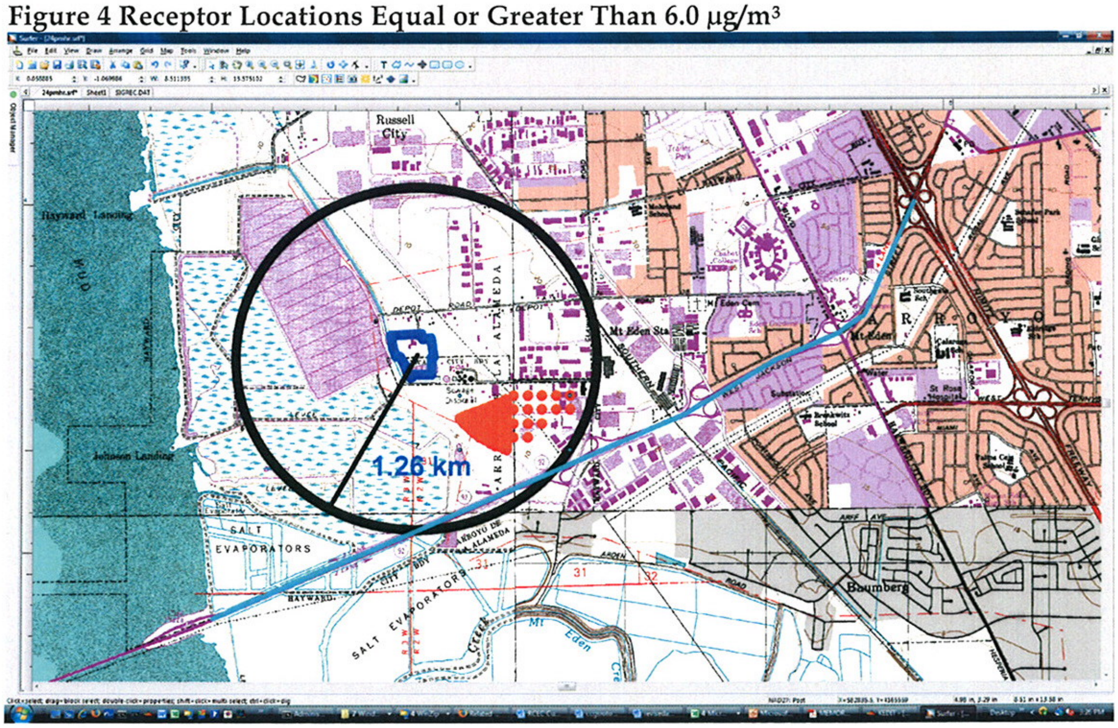
NAAQS Dispersion Modeling Results

1. 24-Hour Standard. To asses whether RCEC causes or contributes to a violation of the 24-hour (daily) PM2.5 NAAQS, AERMOD was run for only those receptors where the RCEC "first high" impacts (*i.e.*, the maximum predicted concentration) exceeded 1.2 μg/m^3 on a 24-hour basis. This is because, according to EPA guidance, a "source will not be considered to cause or contribute to the violation if its own impact is not significant at any violating receptor at the time of each predicted violation." *Draft NSR Workshop Manual*, Draft October 1990, at C.52. Accordingly, even if violations of the NAAQS were modeled at other receptor locations, RCEC could not be found to cause or contribute to any such violation because its maximum modeled concentration at that receptor location would be below the SIL. Thus, the modeling receptor grid of 31,000 receptors was reduced to 6,019 receptors.

To evaluate whether cumulative multisource impacts would exceed the 24-hour NAAQS at those receptor locations, the emissions from the proposed project were then modeled along with the emissions from the BAAQMD-supplied inventory and Highway 92 sources. For comparison with the NAAQS, the 98th percentile 24-hour concentrations were then considered.[24] The highest 98th percentile concentration from this modeling run was 11.27 μg/m³, which, upon the addition of background, would result in an exceedance of the NAAQS. This modeled exceedance was due almost entirely to Highway 92. Moreover, on the particular date of the modeled NAAQS violation, RCEC's contribution was only 0.0013 μg/m³; thus the project's emissions would not "cause or contribute to" this violation and RCEC can nevertheless make the required PSD demonstration.

To reduce the volume of output from the model when the EVENT post processing option was used, AERMOD was instructed to generate a plot file identifying instances where the 98th percentile total impact from all modeled sources equaled or exceeded 6 μg/m³. This concentration was chosen because the existing background applied for all modeled periods is 29.0 μg/m³; thus, any modeled concentration equal to or greater than 6 μg/m³ could produce a violation of the PM2.5 NAAQS standard of 35 μg/m³. Figure 4 displays the locations of all receptors where the 98th percentile modeled concentrations equaled or exceeded 6 μg/m³.

Figure 4 Receptor Locations Equal or Greater Than 6.0 μg/m³



This group of receptors coincides in location with some of the locations where RCEC's impacts were modeled at concentrations exceeding the lowest of EPA's proposed PM2.5 SIL. However, further review of the model output indicates that RCEC's projected exceedances of the SIL never coincide in both time and location with total modeled

24 40 CFR Pt. 51, App. W, § 10.1.c.

concentrations above 6 μg/m³. In other words, when the wind direction is from the northwest, RCEC's impacts sometimes exceeded the SIL at these receptor locations, but the amount contributed from all background sources was too small to result in a total impact that would exceed 6 μg/m³ (*i.e.*, an exceedance of the NAAQS).

Similarly, when the wind direction is from the south-southeast, Highway 92 sometimes impacts these receptor locations at concentrations that, when combined with RCEC's contribution, would exceed 6 μg/m³; but, in all such instances, RCEC's contribution was always less than the SIL for those occurrences. Further, the additional 29 stationary sources located within 6 miles of the project site permitted by the Air District since 2007 did not significantly affect the total modeled concentrations; the maximum 98th percentile 24-hour impact within the model domain from these additional sources was 0.186 μg/m³. Thus, although these sources are already likely accounted for by existing background monitoring data, their contribution was modeled anyway and included in the NAAQS compliance determination as a conservative measure.

This analysis was conducted using the AERMOD EVENT postprocessor. The EVENT postprocessor provides source-by-source contributions at selected receptors during specific events. In this case, the postprocessor identified any event wherein the 98th percentile concentration from RCEC, Highway 92 and the additional sources exceeded 6 μg/m³ and the "first high" concentration from RCEC equaled or exceeded 1.2 μg/m³. Three EVENT input files were generated by AERMOD for post processing. Review of the EVENT processor output confirms that the RCEC project does not contribute above the SIL for any receptor where the model calculates an exceedance of the PM2.5 NAAQS. Table 5 presents the EVENT output for the maximum 24-hour PM2.5 impact. Although other periods were modeled wherein the maximum concentration, after adding the emissions from RCEC, Highway 92 and the 29 additional sources to the identified background concentration of 29 μg/m³, would exceed the 24-hr standard of 35 μg/m³, the results of the post processor confirmed that the contribution of RCEC to all such exceedances is less than the relevant significance threshold (1.2 μg/m³).

Table 5 24-hour Cumulative Impacts Modeling Results (μg/m³)

PM2.5	Maximum Multisource Concentration (μg/m³)	RCEC Contribution (μg/m³)	Modeled Background Contribution (μg/m³)	Monitored Background (μg/m³)	Total Impact (μg/m³)	Federal Standard (μg/m³)
24-hour	11.302	0.00137	11.3007	29.0	40.302	35
Modeled and Background PM25 24-hour averages, for comparison to the federal standard, are the maximum 3-year average of the annual 98th percentile 24-hour concentrations (i.e., for modeled impacts equal to the 8th highest concentration at each receptor). RCEC modeled impacts at each receptor is the first high concentration for comparison to the SIL.						

Included under separate attachment are the AERMOD input/output files on DVD in addition to the EVENT post processing files. The maximum modeled impact from Highway 92 is due primarily to the conservative assumptions used to generate the emissions data as well as the conservative nature of area sources within AERMOD. Additional modeling of Highway 92 using the aforementioned revised road dust emission rate as well as taking into account rain events would certainly reduce the overall impacts from Highway 92.

2. ***Annual Standard.*** A multi-source analysis was also conducted to determine whether the emissions from RCEC would cause or contribute to a violation of the annual PM2.5 NAAQS. According to the modeling analysis, the emissions from RCEC would exceed

the lowest of EPA's proposed SILs of 0.3 μg/m³ at a number of offsite receptor locations, as shown by Figure 1a. To determine whether these impacts from RCEC, when added to the background concentrations of approximately 9.5 μg/m³, plus the contribution from any nearby sources with a significant concentration gradient would exceed the relevant NAAQS (15 μg/m³, annual average), the same sources from the 24-hour analysis were modeled using traffic data from Highway 92 and emissions factors, as provided above in addition to the BAAQMD provided source inventory. The results of the analysis demonstrate that the maximum modeled concentration at all receptors above significance are below the annual NAAQS, as summarized in Table 6.

Table 6 Annual Cumulative Impacts Modeling Results (μg/m³)

PM2.5	Maximum Multisource Concentration (μg/m³)	RCEC Contribution (μg/m³)	Modeled Background Contribution (μg/m³)	Monitored Background (μg/m³)	Total Impact (μg/m³)	Federal Standard (μg/m³)
Annual	1.06	0.513	0.544	9.5	10.56	15

Conclusion

The maximum ambient concentrations predicted as a result of this cumulative source modeling exercise would, when added to the background concentration assumed for the area, exceed the applicable 24-hour PM2.5 NAAQS. This is primarily due to the conservative assumptions and methods used to model contributions from Highway 92. It is also because the background concentrations are already very close to the relevant NAAQS. Indeed, on December 22, 2008, EPA designated the Bay Area as "nonattainment" for the 24-hour PM2.5 NAAQS. As a consequence, the Bay Area will imminently be designated "nonattainment", at which time PM2.5 will no longer be subject to review under the federal PSD rules. [25] Regardless, the foregoing modeling analysis demonstrates that, for all time periods and locations where the model predicted a violation of the standard, RCEC's contribution would be less than the lowest of EPA's proposed Class II SILs and, accordingly, is considered insignificant. Additionally, the annual PM2.5 NAAQS modeling analysis demonstrates compliance with the NAAQS at all receptors which equal or exceed the annual significance level.

Class I Area Impacts Analysis

According to EPA's *Draft NSR Workshop Manual,* an impact analysis must be performed for any PSD source which "may affect" a Class I area *Draft NSR Workshop Manual,* E.16. This includes any PSD source located within 100 km of a Class I area. *Id.* According to the Air District's analysis presented in the December 2008 *Statement of Basis,* the potential impacts of RCEC's emissions of PM10 at Point Reyes National Seashore were only 0.06 μg/m³ (24-hr average), which the Air District found to be below a significance

[25] According to EPA's PSD rules, "[t]he requirements of paragraphs (j) through (r) of this section shall not apply to a major stationary source or major modification with respect to a particular pollutant if the owner or operator demonstrates that, as to that pollutant, the source or modification is located in an area designated as non-attainment under section 107 of the Act." 40 CFR § 52.21(i)(2). The referenced paragraphs (j) through (r) contain the sum and substance of the PSD program.

level of 1 μg/m³. (*Statement of Basis,* at 90.) According to the *Draft NSR Workshop Manual,* EPA's policy requires, at a minimum, an analysis of the source's impacts on "air quality related values" whenever a source's predicted impact in the Class I area would exceed 1 μg/m³. *Draft NSR Workshop Manual,* E.16.

RCEC previously submitted a Class I Area Impacts Analysis that relied upon the PM10 Surrogacy Policy to support its conclusion that the emissions from RCEC would not cause any impacts above the corresponding SILs in any Class I area. This analysis considered potential impacts at the nearest Class I areas, Point Reyes National Seashore (70 kilometers from the project site) and Pinnacles National Monument (145 kilometers from the project site), using the CALPUFF long-range transport model. Additional details regarding the Class I Impacts Analysis can be found in the earlier submittal, dated February 2007.

As described by the *Statement of Basis,* the Air District's modeling indicated maximum 24-hour potential impacts at Point Reyes National Seashore of 0.06 μg/m³, which was found to be below the corresponding Class I SIL for PM10 of 0.3 μg/m³. RCEC's earlier Class I area impacts analysis also demonstrated maximum annual impacts at Point Reyes National Seashore of 0.008 μg/m³, which is significantly below the corresponding Class I SIL for PM10 of 0.2 μg/m³. RCEC's analysis also reported modeled PM10 impacts at Pinnacles National Monument of 0.05 μg/m³ (24-hr avg) and 0.004 μg/m³ (annual avg), which are also below the corresponding Class I SILs for PM10 (0.3 and 0.2 μg/m³, respectively).

For purposes of the Class I impacts analysis for PM2.5, RCEC has compared its earlier analysis' modeled impacts for PM10 with the lowest of EPA's proposed Class 1 SILs for PM2.5. This comparison is shown in the following Table 7.

TABLE 7
PM10 and PM2.5 Class I SILs and Increments

Pollutant	Averaging Interval	Modeled Impact Pinnacle (μg/m³)	Modeled Impact Point Reyes (μg/m³)	Class I Significant Impact Level (μg/m³)	Class I PSD Increment (μg/m³)
PM10	24-Hour	0.05	0.06	0.3	10
	Annual	0.004	0.008	0.2	5
PM2.5	24-Hour	0.05	0.06	0.07	2
	Annual	0.004	0.008	0.04	1

Assuming that RCEC's PM2.5 impacts are the same as the earlier analysis of PM10 impacts results in a conservative over-prediction of potential PM2.5 impacts upon Point Reyes National Seashore and Pinnacles National Monument. This is because the PM10 impacts modeled by the earlier analysis were based upon higher emissions limits than now proposed by RCEC. It also is because, as described previously herein, in is based upon the assumptions that all PM10 is PM2.5 and, for the cooling tower, that all total dissolved solids, is emitted as PM2.5.

As shown by Table 5, if we assume that RCEC's PM2.5 impacts are the same as its previously modeled PM10 impacts, then the potential impacts of PM2.5 on both Point

Reyes National Seashore and Pinnacles National Monument are less than the lowest of EPA's proposed Class I SILs for PM2.5, which are 0.07 and 0.04 $\mu g/m^3$ (as a 24-hour and annual average concentration, respectively).

EPA said that its decision to set the Class I SILs at 4 percent of the proposed Class I increments was based on its belief that, "where a proposed source contributes less than 4 percent to the Class I increment, concentrations are sufficiently low so as not to warrant a detailed analysis of the combined effects of the proposed source and all other increment-consuming emissions." *See* 72 Fed. Reg. at 54140. *Id.* In conclusion, the foregoing analysis demonstrates that no significant impacts on Class I areas are expected as a result of RCEC.