

Exhibit A
EAB filings
08-01

1
received
Via email 1/2/08



"Grandview Realty"
<GrandviewRealty@comcast.net>

To Eurika Durr/DC/USEPA/US@EPA

cc

01/02/2008 01:51 PM

bcc

Subject RE: The BAAQMD permits for Russell City Energy Center were issued in error.docx

BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C.

Re: Bay Area Air Quality Management District
Russell City Energy Center

On November 1, 2007 the Bay Area Air Quality Management District BAAQMD issued an authority to construct, PSD permit and Emission Reduction Credits ERC for the Russell City Energy Center. A 600MW fossil fuel fired facility adjacent to endangered species and protected habitats. Petitioner has another interest in the permit issuance in that I live at the location of the maximum CO impact. Petitioner brings this appeal to revoke the authority to construct PSD permit and ERC for the Russell City Energy Center BAAQMD does not have the authority to issue federal actions in this case. The Authority Issued by the EPA in the January 24, 2006 re-Delegation agreement was for another facility with the same name as "The new" Russell city Energy Center. The authority extends only to the previous facility, and "minor revisions." The prior authority included the requisite for a formal biological opinion from the USFWS.

<http://www.epa.gov/region09/air/permit/pdf/ba-psd-re-delegation-jan06-signed.pdf>

The new Russell City Energy center (RCEC) has a different, non- contiguous location. It is a new permit. The equipment and associated emissions have changed. Many mitigations have been removed. The condition of a Formal Opinion from USFWS has been removed. The operation has changed from a baseload facility to a peaker plant as well as other changes. There is new ownership. It is clearly beyond "minor changes"

The BAAQMD did not follow its rules or those of the clean air act in approving RCEC. The one public notice prior to issuance of the permit was incomplete and ineffective. Petitioner also requests a copy of the amended PDOC which was never provided or noticed to the public and petitioner may have additional issues after review of the document.

1. Public Notice

The BAAQMD failed to notice the issuance and provide a public comment period for the amended PDOC for the RCEC as required by District Regulation 2-2-405. The amended PDOC is only reflected in the Energy Commission Docket Log.

(http://www.energy.ca.gov/dockets/docket_redesign.php?docketNo=01-AFC-7C.htm)

1) The amended PDOC is not even listed on the BAAQMD public noticing page nor was it noticed in any newspapers for public comment as required by district regulation 2-2-405.

2. BACT:

The projects PSD analysis indicates that the project will violate the new California NO2 standard of 332 ug/m3 when combined with background NO2 levels (FDOC table 9). Best Available control Technology is available and achieved in practice which would limit large quantities of NO2 emissions during start-up and prevent violations of the new standard. This technology, the fast start technology OpFlex from General Electric was recommended by the CEC but not required for the project in the FDOC by BAAQMD. This technology has been demonstrated in practice at the Palomar

Project in Escondido and is therefore required under regulation 2-2-206 of the districts rules and regulations as it has been demonstrated in practice and will prevent a significant impact to air quality in the BAAQMD. These emissions would also be considered a public nuisance under the BAAQMD Regulation 1, Section 301: Public Nuisance and the California Health and Safety Code.

3. ERC Deficit

The FDOC identified that the RCEC will surrender ERC's in the amounts of 103 TPY of NOx and 80 TPY of POC to offset new emissions of 134 TPY of NOx and 28.5 TPY of POC. The project has the potential to emit up to 2,213 lbs of NOx per day while the FDOC provides only 844 lbs per day from the issuance of the ERC's. The ERC's mitigate only 38 percent of the projects NOx emissions on any given day.

4. Emission Reduction Credit Exchange

The FDOC also changes the emission reduction package that was presented in the PDOC for the project which is a major alteration of the permit without appropriate opportunity for the public to comment on the projects offset package. The FDOC for the RCEC allows swapping ERC's with an already approved project the East Altamont Energy Center. The East Altamont energy Center's offset package was designed to mitigate significant impacts under CEQA in the Energy Commission siting process and public review and comment is required.

BAAQMD participated in the California Energy Commission (CEC) process and incorporated aspects of it into its decision. The public reasonably thought that concerns expressed to BAAQMD staff at the CEC Hearing would constitute "participation." BAAQMD subsequently opened and closed its public comment period with one notice in the English newspaper. Instructions were not offered in the notice about how to request a hearing, a telephone number, the amount of PSD increment consumed, or the amount of Emission Reduction Credits issued. Public Comments from the CEC hearing were not incorporated into its decision. Other Agencies were not informed including the affected county (Alameda) and city (Hayward) and the San Francisco Bay Conservation and Development Commission, with jurisdiction over the adjacent shoreline. The California Department of fish and Game was not notified. East Bay Regional Park Department was not notified. No outreach to the majority, low income and non-English speaking community adjacent to the site occurred. The nearby hospitals were not notified. The current participants and the participants from the previous approval were not noticed.

The CEC approved the project. The CEC physical measurements for notice and environmental Justice Issues were from the middle of the project. Under this logic a 2 mile wide facility would need to consider and notice no one. This act reduced the apparent population impact, probably by a factor of five and about 440 acres.

Appeals to the CEC decision are pending in the Supreme Court of California. Parties include the County of Alameda, Chabot College and other groups. Air Quality is the major concern followed by Failure to provide proper notice. BAAQMD issued its Final notice of action despite these actions without notifying any of the parties.

The Final notice of Action includes all of the above. Also, it does not have the address of the facility. The notice states that it is effective on November 1st. It is dated November 30th and Posted December 6th. It was not posted until after numerous comments from me. BAAQMD has resisted my attempts for clarification and participation. We feel at a distinct disadvantage receiving a notice after the fact.

The site is a non-attainment area. The conclusions of the determination of compliance do not include a determination of public benefit.

The EPA relied on incorrect information when it made its request for an informal opinion from USFWS. The impacts of air, noise, light and water

pollution were not considered. The measurement for noise impacts was to the Cogswell footbridge at the opposite end of the end of the protected habitat. The impact in the actual habitat could be 70db. The site is surrounded on at least 180 degrees by wetlands.

Better technology was recommended by the CEC but not supported by BAAQMD. Determinations were made based upon outdated information. No measure of greenhouse gas emissions was demonstrated. The cumulative effects; of this project, the Nearby Eastshore Energy Center proposal, and the 2 freeways near both sites was not considered. The Greenhouse gas emissions dwarf the goals of the Districts \$3,000,000 greenhouse gas reduction grant program. A virtual repeat of the above is now occurring with the Eastshore Energy Center licensing process. BAAQMD received over 1000 public comments and did not elect to have a hearing, consider their concerns or notify the commenter's of further action.

BAAQMD Toxic Air Contaminant (TAC) health risk screening does not including Acrolein, and, at least for Eastshore, their emission factors are much lower than the EPA's HAPs (Hazardous Air Pollutants).

I ask for reasonable fees for participation/intervention in BAAQMD actions including, legal and expert opinions. Should the board not summarily agree to my above requests I ask for time to secure legal counsel and expert testimony for an oral hearing. I also request a waiver of any fees. As a member of the public with no direct financial motive any fees would create a hardship.

Rob Simpson 510-909 1800
27126 Grandview Avenue Hayward California 94542

While my primary means of communication with relevant agencies has been verbal. The following is a record of relevant email communications.

Page 6-8 Emanuelle Ropicavoli/R9/USEPA/US@EPA

Pages 9-18 BAAQMD

Pages 9-23 USEFWS

Page 24-25 argument for BACT

Hi Rob,

I did contact BAAQMD and they did verify that they published a public notice in the Oakland Tribune on April 12, 2007 announcing the proposed permit. They issued the permit on November 1st, 2007. The permit became effective one month later and was noticed at that time again in the Oakland Tribune on December 3rd, 2007.

Because we have delegated the issuance of this permit to the BAAQMD, they are responsible for the public notice requirements of this permit.

To view our delegation agreement to the BAAQMD, visit:

<http://www.epa.gov/region09/air/permit/pdf/ba-psd-re-delegation-jan06-signed.pdf>

To appeal the PSD portion of the permit, you can send your written appeal to the Environmental Appeals Board. At this point, EPA region 9 can not opine on these appeals, it is up to the EAB to review your case. Information on how to appeal can be found here:

<http://www.epa.gov/eab/>

NOTICE: All filings delivered to the Board by hand or courier, including Federal Express, UPS, and U.S. Postal Express Mail, MUST be delivered to the following address:

Colorado Building

1341 G Street, NW
Suite 600
Washington, D.C. 20005

All documents that are sent through the U.S. Postal Service (except by Express Mail) MUST be addressed to the EAB's mailing address, which is:

U.S. Environmental Protection Agency
Clerk of the Board, Environmental Appeals Board (MC 1103B)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460-0001

I hope that is helpful,
Emanuelle Rapicavoli/R9/USEPA/US@EPA 12/12/2007 03:46

Emanuelle,

Any luck finding out if there is a PSD permit and if the procedures are in compliance?
Rob

-----Original Message-----

From: Rapicavoli.Emmanuelle@epamail.epa.gov
[mailto:Rapicavoli.Emmanuelle@epamail.epa.gov]
Sent: Monday, December 10, 2007 6:31 PM
To: Grandview Realty
Subject: Re: FW: Russell City Energy Center

Hi Rob,

I am still looking into this with the BAAQMD. I'll try to get you a response by Wed. Thanks for your patience,

Emmanuelle 12/07/2007 10:04 FW: Russell City Energy Center

Hi Emmanuelle,

Have you had any luck obtaining public notices from BAAQMD that comply with 124.10. Can you tell me the date of issuance of the PSD permit.

The other section that I questioned is also from 124.10. oops I said 124.11 below I think that it is all in 124.10
(vii) For PSD permits only, affected State and local air pollution control agencies, the chief executives of the city and county where the major stationary source or major modification would be located, any comprehensive regional land use planning agency and any State, Federal Land Manager, or Indian Governing Body whose lands may be affected by emissions from the regulated activity;

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Wednesday, December 05, 2007 12:54 PM
To: 'rapicavoli.emmanuelle@epa.gov'
Subject: Russell City Energy Center

Hi Emmanuelle,

I did find one of the sections I referenced. Sorry I'll try to be more organized. Can you tell me if this section applies?
Thank You

Rob Simpson
Hayward Area Planning Association
510-909-1800

124.11 page 280-281

(d) Contents (applicable to State programs, see §§ 123.25 (NPDES), 145.11 (UIC), 233.26 (404), and 271.14 (RCRA))—
(1) All public notices. All public notices issued under this part shall contain the following minimum information:
(i) Name and address of the office processing the permit action for which notice is being given;
(ii) Name and address of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit, except in the case of NPDES and 404 draft general permits under §§ 122.28 and 233.37;
(iii) A brief description of the business conducted at the facility or activity described in the permit application or the draft permit, for NPDES or 404 general permits when there is no application.
(iv) Name, address and telephone number of a person from whom interested persons may obtain further information, including copies of the draft permit or draft general permit, as the case may be, statement of basis or fact sheet, and the application; and
(v) A brief description of the comment procedures required by §§ 124.11 and 124.12 and the time and place of any hearing that will be held, including a statement of procedures to request a hearing (unless a hearing has already been scheduled) and other procedures by which the public may participate in the final permit decision.

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Version: 7.5.503 / Virus Database: 269.16.14/1172 - Release Date:
12/5/2007 8:41 AM

Mr. Bateman,
Thank you for your answers. If you would be more comfortable with you attorney answering my questions I can understand that. I think that they are reasonable questions regarding the public permitting process. While I do not believe that I threatened litigation against BAAQMD I did reference existing Supreme Court litigation. I would think that all actions of BAAQMD are inherently under threat of litigation. I will forward my correspondence with your staff to you so you can see if you think my comments constitute a particular threat.
My questions are basically the same as they have been. I would like to know the dates of all actions. I believe that my confusion is understandable given the new notice of final action posted on your website Dec. 6, dated

Nov. 30 effective Nov. 1

I would like to know if the code sections below pertain to this action and if so how they have been satisfied because I cannot find any satisfaction of the requirements and they certainly appear to apply. My fourth question below meant to ask if the original authority to construct had expired.

Again, I would like to request a public hearing.

Thank You,
Rob Simpson
12/06/07

Hayward Area Planning Association

Mr. Simpson:

Our Legal Council has informed me that you have threatened litigation against the BAAQMD over the issuance of our permit for the Russell City facility. Accordingly, we have been advised to not discuss detailed issues regarding permit issuance with you. Of course, you are entitled to review public records in our possession -- I believe that you have indicated that you have already made such a Public Records Request.

Here are brief responses to the five numbered questions in your e-mail.

- 1 has the authority to construct been issued
Yes.
- 2 has the ERC banking been approved
If you are referring to the ERCs provided by the applicant for this project, yes.
- 3 has the PSD permit been issued
Yes (the Authority to Construct also serves as the PSD permit).
- 4 did the original application expire?
No, the disposition of the original application was the issuance of an Authority to Construct.
- 5 Is this considered a new application or an amendment to the original app?
It is considered a new application that is an amendment to the original proposed project.

Brian Bateman
Director of Engineering
Bay Area Air Quality Management District
(415) 749-4653

-----Original Message-----

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Thursday, December 06, 2007 5:29 PM
To: Brian Bateman
Subject: FW: russell city energy center

Mr. Bateman,

Thank you for any effort to answer the following questions.

Rob Simpson

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Thursday, December 06, 2007 10:34 AM
To: 'Weyman Lee'

Subject: FW: russell city energy center

Weyman,

I am trying to determine the sequence of events and present status of the project.

- 1 has the authority to construct been issued
 - 2 has the ERC banking been approved
 - 3 has the PSD permit been issued
 - 4 did the original application expire?
 - 5 Is this considered a new application or an amendment to the original app?
- If any of these events has happened can you tell me the dates and direct me to any notices.

My other questions pertain to the following sections. Can you tell me if

they apply to the Russell city project and if so how they have been satisfied. Particularly the Highlighted portions. Again I would like to request a public hearing.

Thank You

Rob Simpson

2-4-405 Publication, Public Comment and Inspection: Before approving the banking of any emission reduction in excess of 40 tons per year of any pollutant or before declaring a moratorium on further banking of emission reductions, the APCO shall cause to be published in at least one newspaper of general circulation within the District, and be sent to any individual submitting a written request to the APCO for notification, a notice stating the preliminary decision of the APCO to approve the banking of emission reductions or to declare a moratorium on further banking of emission reductions and inviting written public comment. The APCO shall make available for public inspection at District headquarters the information submitted by

2-2-405 Publication and Public Comment: If the application is for a new major facility or a major modification of an existing major facility, or requires a PSD analysis, or is subject to the MACT requirement, the APCO shall within 10 days of the notification of the applicant, cause to have published in at least one newspaper of general circulation within the District, a prominent notice stating the preliminary decision of the APCO, the location of the information available pursuant to Section 2-2-406, and inviting written public comment for a 30 day period following the date of publication. Written notice of the preliminary decision shall be sent to the ARB, the regional office of the EPA and adjacent districts. A copy of this notice shall be provided to any person who requests such specific notification in writing. During this period, which may be extended by the APCO, the APCO may elect to hold a public meeting to receive verbal comment from the public. The written notice shall contain the degree of PSD increment consumed.

2-3-404 Public Notice, Comment and Public Inspection: The preliminary decision made pursuant to Section 2-3-403 shall be subject to the public notice, public comment and public inspection requirements contained in Section 2-2-406 and 407 of Rule 2.

40cfr51q) Public participation. The plan shall provide that-

(1) The reviewing authority shall notify all applicants within a specified time period as to the completeness of the application or any deficiency in the application or information submitted. In the event of such a deficiency, the date of receipt of the application shall be the date on which the reviewing authority received all required information.

(2) Within one year after receipt of a complete application, the reviewing authority shall:

(i) Make a preliminary determination whether construction should be approved, approved with conditions, or disapproved.

(ii) Make available in at least one location in each region in which the proposed source would be constructed a copy of all materials the applicant submitted, a copy of the preliminary determination, and a copy or summary of other materials, if any, considered in making the preliminary determination.

(iii) Notify the public, by advertisement in a newspaper of general circulation in each region in which the proposed source would be constructed, of the application, the preliminary determination, the degree of increment consumption that is expected from the source or modification, and of the opportunity for comment at a public hearing as well as written public comment.

(iv) Send a copy of the notice of public comment to the applicant, the Administrator and to officials and agencies having cognizance over the location where the proposed construction would occur as follows: Any other State or local air pollution control agencies, the chief executives of the city and county where the source would be located; any comprehensive regional land use planning agency, and any State, Federal Land Manager, or Indian Governing body whose lands may be affected by emissions from the source or modification.

40cfr124.10

(v) Provide opportunity for a public hearing for interested persons to appear and submit written or oral comments on the air quality impact of the source, alternatives to it, the control technology required, and other appropriate considerations.

(vi) Consider all written comments submitted within a time specified in the notice of public comment and all comments received at any public hearing(s) in making a final decision on the approvability of the application. The reviewing authority shall make all comments available for public inspection in the same locations where the reviewing authority made available preconstruction information relating to the proposed source or modification.

(vii) Make a final determination whether construction should be approved, approved with conditions, or disapproved

(vii) For PSD permits only, affected State and local air pollution control agencies, the chief executives of the city and county where the major stationary source or major modification would be located, any comprehensive regional land use planning agency and any State, Federal Land Manager, or Indian Governing Body whose lands may be affected by emissions from the regulated activity;

(d) Contents (applicable to State programs, see §§123.25 (NPDES), 145.11 (UIC), 233.26 (404), and 271.14 (RCRA)) --(1) All public notices. All public notices issued under this part shall contain the following minimum information:

(i) Name and address of the office processing the permit action for which notice is being given;

(ii) Name and address of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit, except in the case of NPDES and 404 draft general permits under §§122.28 and 233.37;

(iii) A brief description of the business conducted at the facility or activity described in the permit application or the draft permit, for NPDES or 404 general permits when there is no application.

(iv) Name, address and telephone number of a person from whom interested persons may obtain further information, including copies of the draft permit or draft general permit, as the case may be, statement of basis or fact sheet, and the application; and

(v) A brief description of the comment procedures required by §§124.11 and 124.12 and the time and place of any hearing that will be held, including a statement of procedures to request a hearing (unless a hearing has already been scheduled) and other procedures by which the public may participate in the final permit decision.

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Version: 7.5.503 / Virus Database: 269.16.13/1170 - Release Date: 12/4/2007
10:52 AM

From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]
Sent: Tuesday, December 04, 2007 1:34 PM
To: Grandview Realty
Subject: RE: Russell City

I gave you my answer when we talked before. The District can demonstrate that it complied with the applicable state and federal requirements with respect to this project. I know you may disagree with that, but I think you are incorrect. As I also stated, anywhere where the District did not properly follow a requirement, we will fix any deficiencies. We already did so by publishing a notice of the permit issuance in the newspaper. I do not see any other deficiencies. I also note that many of the regulatory provisions that you've cited do not even apply to PSD permits or District authority to construct permits. I'm really not interested in spending any more time trying to go through each one with you to explain why it does or does not apply.

Sandy Crockett

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Tuesday, December 04, 2007 1:17 PM
To: Alexander Crockett
Subject: RE: Russell City

Is that what you thought was criticism? Again I apologize that was not meant to be a criticism. I considered it one of the admiral functions of the legal profession. I just wanted to get you to argue for truth and justice. So if we can set the personalities aside. This issue is not going to go away. As you know there are several supreme court actions regarding this issue. I think that we both know that BAAQMD actions will not survive scrutiny. So please answer my question of your intended course of action. I am not trying to argue with you I am just trying to get a straight answer to a direct question.

I'll ask it again. If you are not in a position to answer just say so. Can you demonstrate compliance with the state and federal laws that I cited or are you going to reopen the procedure or do you have another course of action?

Thanks

From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]
Sent: Tuesday, December 04, 2007 12:56 PM
To: Grandview Realty
Subject: RE: Russell City

I find it ironic that you criticized me for having a "vocation to argue".

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Tuesday, December 04, 2007 12:48 PM
To: Alexander Crockett
Subject: RE: Russell City

I am afraid that I do not understand your position. Can you demonstrate compliance with the state and federal laws that I cited or are you going to reopen the procedure or do you have another course of action?

Rob Simpson

From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]
Sent: Tuesday, December 04, 2007 12:39 PM
To: Grandview Realty
Subject: RE: Russell City

As we have discussed, we each have our respective positions on the propriety of the notice that was given for these proceedings, and there would be little use in spending more time going around and around debating them further.

Sandy Crockett

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Tuesday, December 04, 2007 12:32 PM

To: Alexander Crockett

Subject: RE: Russell City

You are very welcome. Will you be holding a public hearing and legally noticing the proceedings?

Rob

From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]

Sent: Tuesday, December 04, 2007 12:23 PM

To: Grandview Realty

Subject: Russell City

Mr. Simpson:

I got your voice mail message regarding the Russell City project. Yes, I received your emails. Thanks for your input.

Sandy Crockett

Alexander G. Crockett, Esq.

Assistant Counsel

Bay Area Air Quality Management District

939 Ellis Street

San Francisco, CA 94109

Phone: (415) 749-4732

Fax: (415) 749-5103

www.baaqmd.gov

I think we've already thoroughly discussed the issues of substance in our phone conversations last week. As you know, the District and the Energy Commission did consider the fast-start technology and determined that it was not appropriate for this proposed facility. The cumulative impacts of this and other projects were also evaluated in great detail. And the public and interested entities were given notice of the permitting action and an opportunity to comment. You have a right to your opinion on these points, but I don't think it would be a good use of our time for us to continue to restate our respective positions.

As for your personal insinuations, I do not intend to dignify them with a response.

Sandy Crockett

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Monday, December 03, 2007 1:25 PM

To: Alexander Crockett

Cc: Public Records; Weyman Lee

Subject: RE: PSD Permit Appeals

Thank you,

Will you be responding to the other issues, that I addressed below, at this time?

Rob

From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]

Sent: Monday, December 03, 2007 1:16 PM

To: Grandview Realty

Cc: Public Records; Weyman Lee

Subject: RE: PSD Permit Appeals

To review documents related to the Russell City project, you will need to schedule a time with our public records coordinator. Please send her a public records request using the link on our homepage - it's at the top in the middle of the page. Specify the category of documents you want to look at, and then you can set up a time with her to do so. I'm also cc'ing her on this email so she'll know to expect your request.

To have you included on a mailing list for information about the project, I am also forwarding your email to Weyman Lee, the permit engineer for the project.

Sandy Crockett

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Monday, December 03, 2007 12:04 PM

To: Alexander Crockett

Subject: RE: PSD Permit Appeals

Dear Sandy,

I would like to schedule a time to review the entire Russell City file. Please also add me to your interested parties list for All Hayward air quality issues including Russell City And Eastshore Energy Center.

I realize that it is your vocation to argue. I hope that you will take the opportunity to argue for the environment and the bay area air quality and not become a tool of major polluters. The BAAQMD process did not work in this instance. You can argue that it did or help to fix the problem. This thing is heading for the Supreme court. Thousands of people have contested the process in writing and verbal testimony, many regarding air quality issues. Your representative participated in some of the hearings. This gave people the impression that BAAQMD was considering their expressed positions in its process. If these hearings did not constitute hearings for your purposes it certainly gave ample notice of public interest for you to hold your own hearings. Your notice list should at the very least include the CEC notice list.

Notice and hearing requirements of the issuance of FDOC, Authority to construct, ERC banking as well as the federal requirements of the PSD permit were not completed. Comments received through the CEC hearings were not properly logged. The cumulative effects of this and the Eastshore facility were not considered. Outdated data was used to form inadequate conclusions. The CEC staff recommended "fast start Technology" that would eliminate 70,000 pounds of NO2 emissions per year as well as other benefits had BAAQMD supported the recommendation.

A piecemeal repair of this process is not possible. Please suspend the determination of compliance, reopen the public review process and hold appropriate public hearings on this matter.

Fight the polluters not the individuals, environmental groups and government agencies that support air quality. We should be on the same side here. Be the steward of air quality that you must have planned to be. Fight the good fight.

Rob Simpson

510-909-1800

27126 Grandview Avenue

Hayward CA 94542 From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]

Sent: Friday, November 30, 2007 12:31 PM To: Grandview Realty

Subject: PSD Permit Appeals Here is another document you may be interested in. This is a layperson's guide to appealing the issuance of federal permits at the Environmental Appeals Board in Washington, DC. Page 5 discusses PSD permits and the EAB's authority as the appellate body for these permits. Pages 23-24 discuss the requirement that someone participate in the PSD permitting process - by submitting written comments on the proposed PSD permit - in order to be able to pursue an appeal. Someone who did not participate by submitting comments has not right to appeal the permit.

Sandy Crockett

[http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/8f612ee7fc725edd852570760071cb8e/8183679c852918fb8525732200729b96/\\$FILE/CitizensGuide%2011-13-06.pdf](http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/8f612ee7fc725edd852570760071cb8e/8183679c852918fb8525732200729b96/$FILE/CitizensGuide%2011-13-06.pdf)

Alexander G. Crockett, Esq.

Assistant Counsel

Bay Area Air Quality Management District

939 Ellis Street

San Francisco, CA 94109

Phone: (415) 749-4732

I'm not sure that you have the correct regulatory requirement here, but the substance is correct - our agency is required to give adequate public notice and an opportunity to comment before taking permit actions like issuing a

PSD permit. We did that here - we gave notice of the proposed issuance of a PSD permit for this facility to the public and to EPA and other agencies, and we invited comment on the proposed permit. We satisfied all applicable procedural requirements for issuance of this permit.

Sandy Crockett

Alexander G. Crockett, Esq.
Assistant Counsel
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
Phone: (415) 749-4732
Fax: (415) 749-5103

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Friday, November 30, 2007 11:04 AM To: Alexander Crockett

Subject: notice required

This section only speaks to public notice, notice to affected agencies is also a concern.

Rob

http://a257.g.akamaitech.net/7/257/2422/12feb20041500/edocket.access.gpo.gov/cfr_2004/julqtr/pdf/40cfr70.7.pdf

(h) Public participation. Except for modifications qualifying for minor permit

modification procedures, all permit proceedings, including initial permit issuance, significant modifications, and renewals, shall provide adequate procedures for public notice including offering an opportunity for public comment and a hearing on the Sfmt 8010 Y:\SGML\203153T.XXX 203153T 235

Environmental Protection Agency § 70.8

draft permit. These procedures shall include the following:

(1) Notice shall be given: by publication in a newspaper of general circulation

in the area where the source is located or in a State publication designed to give general public notice; to persons on a mailing list developed by the permitting authority, including those who request in writing to be on the list; and by other means if necessary to assure adequate notice to the affected public;

<<40cfr124.15.url>> Mr. Simpson:

I found the EPA regulatory requirement for notice of the final issuance of a federal permit (which the PSD permit is). It is in 40 C.F.R. section 124.15(a), a PDF copy of which can be found at the link below. As you will see, notice of the final issuance needs to be sent to the applicant and anyone who submitted comments on the proposed permit. There is no requirement for general public notice such as publication in a newspaper, on a website, or to the CEC's service list.

http://a257.g.akamaitech.net/7/257/2422/03jul20071500/edocket.access.gpo.gov/cfr_2007/julqtr/pdf/40cfr124.15.pdf

Sandy Crockett

Alexander G. Crockett, Esq.
Assistant Counsel
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
Phone: (415) 749-4732
Fax: (415) 749-5103

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Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.16.11/1161 - Release Date: 11/30/2007
12:12 PM

---Original Message-----

From: Weyman Lee [mailto:Weyman@baaqmd.gov]
Sent: Thursday, December 06, 2007 9:46 AM
To: grandviewrealty@comcast.net
Cc: Bob Nishimura
Subject: RE: Russell City

The analyses were submitted by Calpine in their Application for Certification (AFC). You should also read the evaluation of the issues by the CEC in the staff assessment (PSA and FSA). These documents are available at the CEC website.

Weyman

-----Original Message-----

From: Bob Nishimura
Sent: Wednesday, December 05, 2007 2:11 PM
To: Weyman Lee
Subject: FW: Russell City

Weyman,

Do you want to answer Mr. Simpson statement?

Bob

-----Original Message-----

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Wednesday, December 05, 2007 1:23 PM
To: Bob Nishimura
Subject: Russell City

Can you also direct me to the following analysis

2-2-401 Application: In addition to the requirements of Regulation
2-1-402, applications for

authorities to construct facilities subject to Rule 2 shall include all
of the following:

401.1 For new facilities, which will emit, and for a modification which
will increase

emissions more than 100 tons per year of carbon monoxide or 40 tons per
year of either precursor organic compounds or nitrogen oxides, an
analysis

of alternative sites, sizes, production processes, and environmental
control

techniques for such proposed source which demonstrate that benefits of
the

proposed source significantly outweigh the environmental and social
costs

imposed as a result of its location, construction or modification.

No virus found in this outgoing message.
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Version: 7.5.503 / Virus Database: 269.16.14/1172 - Release Date:
12/5/2007 8:41 AM

Dear Mr. Olah,

I have read with great concern the letter from the EPA to you regarding the Russell City Energy Center in the City of Hayward.
http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-06-11_REQUEST_FOR_INFORMAL_CONSULTATION.PDF

The letter incorrectly identifies the project. It states that "the nearest tidal marshes are 1400 feet to the south and separated from the project by distribution warehouses. In its new location Russell City would avoid impacts to seasonal wetlands and the protected species mentioned above."

The CEC staff report more correctly identifies the location as follows;

(see LAND USE Figure 1). It is immediately adjacent to salt ponds and levees, designated as Baylands in the City of Hayward General Plan, and the City of Hayward flood control channel. All areas to the north, east, and south of the project area are utilized for mixed industrial and commercial purposes. Baylands west of the project site have been set aside by the City of Hayward as Open Space and are included in the wetlands, marsh, and protected upland areas being restored under direction of the Hayward Area Shoreline Planning Agency (HASPA).

JUNE 2007 4.5-7 LAND USE
<http://www.energy.ca.gov/2007publications/CEC-700-2007-005/CEC-700-2007-005-FSA.PDF>

The attachment to the letter to you includes excerpts from Calpine's application. The area map incorrectly identifies the Eden Landing Preserve as "salt ponds"

The Calpine application identifies the elimination of mitigation Bio-10 but does not address the big issues identified in the final decision, elimination of the condition requiring consultation and a biological opinion from you, the Army Corp. of Engineers, and the San Francisco Bay Water Control board. They have also omitted Fish and Game SFBCDC and anyone else who may be contrary to licensing a thermal power plant adjacent to sensitive wetlands. They have also eliminated many of the air quality mitigations.

This project will have direct negative unmitigated effects upon endangered wildlife

This decision of the CEC is being appealed by multiple parties including the county of Alameda, California pilots association, Chabot College and numerous environmental groups.
The Hearing is tomorrow at 10 AM at the CEC. Please attend to reopen the evidentiary hearing.

The following sections have been deleted from the final decision apparently without notice or regard for you.

BIO-6 through BIO-10, Deleted.

USFWS BIOLOGICAL OPINION

BIO-6 Formal consultation between the USFWS and USEPA shall be completed, and the project owner shall implement all terms and conditions of the resulting Biological Opinion.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner must provide the Energy Commission CPM with a copy of the USFWS Biological Opinion. All terms and conditions of the Biological

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Opinion will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

U. S. ARMY CORPS OF ENGINEERS SECTION 404 PERMIT

BIO-7 The project owner shall acquire and implement the terms and conditions of the USACE Section 404 permit.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner shall submit to the CPM a copy of the permit required to fill on-site wetlands. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD CERTIFICATION

BIO-8 The project owner will acquire and implement the terms and conditions of a San Francisco Bay Regional Water Quality Control Board Section 401 State Clean Water Act certification.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner will provide the CPM with a copy of the final Regional Water Quality Control Board certification. The terms and conditions of the certification will be incorporated into the project's Biological Resources Mitigation Implementation and Monitoring Plan.

STORM WATER MANAGEMENT PLAN

BIO-9 The project owner shall develop a RCEC Storm Water Management Plan in consultation with the U.S. Fish and Wildlife Service, East Bay Regional Parks District, Hayward Area Parks and Recreation District, San Francisco Bay Regional Water Quality Control Board, City of Hayward Public Works Department, Alameda County Flood Control District and Staff.

Verification: The project owner will submit to the CPM a Storm Water Management Plan at least 60 (sixty) days prior to the start of any site mobilization activities (See Soil and Water Resources, Condition of Certification Soil & Water-3). The final approved plan will also be contained in the RCEC Biological Resources Mitigation Implementation and Monitoring Plan.

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HABITAT COMPENSATION

BIO-10 The project owner shall provide 26.19 acres of habitat to compensate for the loss of upland, freshwater seasonal wetlands. To mitigate the permanent and temporary loss of habitat, the project owner shall:

1. Purchase 26.19 acres of habitat adjacent to the proposed RCEC site;
2. Donate the 26.19 acres of habitat to the East Bay Regional Park District ("EBRPD");
3. Assist in arranging a long-term lease to the EBRPD for 30 acres of salt marsh habitat owned by the City of Hayward;
4. Provide a suitable endowment fund to the EBRPD to manage the proposed habitat compensation and the City of Hayward property in perpetuity;
5. Implement the terms of the Agreement between EBRPD and the Russell City Energy Center

LLC, to the extent such terms are consistent with the terms and conditions of this decision; and 6. Record, with the deed to the 26.19 acres of habitat compensation, an appropriate instrument containing such covenants as will benefit EBRPD and restrict use of the land as an enhanced wetland consistent with the terms and conditions of this decision. Such restriction shall be for the duration of the enhancement and monitoring activities specified in Section 1.2 of the Agreement between EBRPD and the Russell City Energy Center LLC.

Verification:

1. No less than 30 days prior to any site mobilization activities, the project owner shall provide written verification to the CPM that the required habitat compensation has been purchased and the restricting covenants recorded.
2. No more than 90 days after completion of the enhancement actions specified in Section 1.2 of the Agreement between the Russell City Energy Center LLC and the EBRPD, and their approval by the regulatory agencies, the project owner must provide written verification to the CPM that the Applicant has provided to the EBRPD a fee simple deed to the 26.19 acre parcel.
3. No less than 30 days prior to the start of construction of permanent structures, the project owner shall provide written verification to the CPM that the Applicant has paid to the EBRPD the first payment of \$300,000. Thereafter, as each subsequent payment is made to the

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EBRPD in accordance with the terms of the Agreement between RCEC and EBRPD, the project owner shall provide written verification to the CPM within 30 days after each payment is made.

4. BIO-10 is independent of, and is not intended to change, the contractual rights and obligations of the Agreement between RCEC and EBRPD.

http://www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12_COMMIS_SION_DECIS.PDF

Rob Simpson, Real Estate Broker

Grandview Realty 11/2/2007 11:04 AM

Application Number 15487 Facility ID # B3161.

One basis for the appeal relates to violations of District rules and Regulations in the analysis and issuance of the Authority to Construct. Specifically the petitioner alleges that the District violated section 2-2-301 by failing to require Best Available Control Technology for the project. Outdated information was used in determination The EPA models SCREEN3 and ISCST3 were used in the air quality impacts analysis based upon 1990-1994 ozone and meteorological data. Reference is made to NO2 concentrations for the last five years, 1996-2000. The BACT determination stems from a 1999 report from Onsite Sycom for GE turbines not the approved Westinghouse turbines. It fails to provide proven present technology that would limit the facilities potential high NOx emissions that occur during the power plants startup and shutdown cycles. The hourly emissions during startup and shutdown are much greater than during normal operation since the plants SCR and ammonia injection system are not operating at optimal conditions. The resulting emissions could have a significant effect on ozone and air quality in the Bay Area air basin. The projects emissions combined with background NO2 levels also has the potential to violate the new ARB NO2 standard promulgated on February 23, 2007. If this project was needed it should have been required to utilize fast start technology which can lower the projects startup time from six hours to one hour and lessen the projects proposed cold start NOx emissions from 480 pounds to 22 pounds and the warm start emission from 240 to 28 pounds per event. This technology has been utilized in practice at the Palomer Power Project in Escondido and is approved for The El Segundo facility. The technology is

cost effective and utilized in practice. The CEC staff recommended this technology. District Staff was informed on the merits of the fast start technology but failed to include it in the BACT analysis or require it for the project.

Petitioners also allege that the Health Risk assessment is inadequate since the assessment fails to analyze the impacts of some of the toxic air contaminants. There is also significant opportunity for bio-sequestration of emissions in the area.

-----Original Message-----

From: Durr.Eurika@epamail.epa.gov [mailto:Durr.Eurika@epamail.epa.gov]
Sent: Wednesday, January 02, 2008 10:30 AM
To: Grandview Realty
Subject: Re: The BAAQMD permits for Russell City Energy Center were issued in error.docx

Can not open the document. Can you email it in PDF?
Thanks

Eurika Durr
Clerk of the Board
Environmental Appeals Board
U.S. Environmental Protection Agency
Phone: 202-233-0110
Fax: 202-233-0121

"Grandview
Realty"
<GrandviewRealty
@comcast.net>

Eurika Durr/DC/USEPA/US@EPA
To
cc

01/02/2008 01:22
PM

Subject
The BAAQMD permits for Russell
City Energy Center were issued in
error.docx

<<...>>

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Version: 7.5.516 / Virus Database: 269.17.13/1207 - Release Date:
1/2/2008 11:29 AM

(See attached file: The BAAQMD permits for Russell City Energy Center were issued in error.docx)

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Version: 7.5.516 / Virus Database: 269.17.13/1207 - Release Date: 1/2/2008
11:29 AM

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Version: 7.5.516 / Virus Database: 269.17.13/1207 - Release Date: 1/2/2008
11:29 AM

2

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C.**

RECEIVED
U.S. E.P.A.
Soil
27 JAN -4 AM 9:31

ENVIR. APPEALS BOARD

Re: Bay Area Air Quality Management District

Russell City Energy Center

On November 1, 2007 the Bay Area Air Quality Management District

BAAQMD issued an authority to construct, PSD permit and Emission Reduction Credits ERC for the Russell City Energy Center. A 600MW fossil fuel fired facility adjacent to endangered species and protected habitats. Petitioner has another interest in the permit issuance in that I live at the location of the maximum CO impact. Petitioner brings this appeal to revoke the authority to construct PSD permit and ERC for the Russell City Energy Center

BAAQMD does not have the authority to issue federal actions in this case. The Authority Issued by the EPA in the January 24, 2006 re-Delegation agreement was for another facility with the same name as "The new" Russell city Energy Center. The authority extends only to the previous facility, and "minor revisions." The prior authority included the requisite for a formal biological opinion from the USFWS.

The new Russell City Energy center (RCEC) has a different, non- contiguous location. It is a new permit. The equipment and associated emissions have changed. Many mitigations have been removed. The condition of a Formal Opinion from USFWS has been removed. The operation has changed from a baseload facility to a peaker plant as well as other changes. There is new ownership. It is clearly beyond "minor changes"

The BAAQMD did not follow its rules or those of the clean air act in approving RCEC. The one public notice prior to issuance of the permit was incomplete and ineffective. Petitioner also requests a copy of the amended PDOC which was never provided or noticed to the public and petitioner may have additional issues after review of the document.

1. Public Notice

The BAAQMD failed to notice the issuance and provide a public comment period for the amended PDOC for the RCEC as required by District Regulation 2-2-405. The amended PDOC is only reflected in the Energy Commission Docket Log.

(http://www.energy.ca.gov/dockets/docket_redesign.php?docketNo=01-AFC-7C.html) The amended PDOC is not even listed on the BAAQMD public noticing page nor was it noticed in any newspapers for public comment as required by district regulation 2-2-405.

2. BACT:

The projects PSD analysis indicates that the project will violate the new California NO2 standard of 332 ug/m3 when combined with background NO2 levels (FDOC table 9). Best Available control Technology is available and achieved in practice which would limit large quantities of NO2 emissions during start-up and prevent violations of the new standard. This technology, the fast start technology OpFlex from General Electric was recommended by the CEC but not required for the project in the FDOC by BAAQMD. . This technology has been demonstrated in practice at the Palomar Project in Escondido and is therefore required under regulation 2-2-206 of the districts rules and regulations as it has been demonstrated in practice and will prevent a significant impact to air quality in the BAAQMD. These emissions would also be considered a public nuisance under the BAAQMD Regulation 1, Section 301: Public Nuisance and the California Health and Safety Code.

3. ERC Deficit

The FDOC identified that the RCEc will surrender ERC's in the amounts of 103 TPY of NOx and 80 TPY of POC to offset new emissions of 134 TPY of NOx and 28.5 TPY of POC. The project has the potential to emit up to 2,213 lbs of NOx per day while the FDOC provides only 844 lbs per day from the issuance of the ERC's. The ERC's mitigate only 38 percent of the projects NOx emissions on any given day.

4. Emission Reduction Credit Exchange

The FDOC also changes the emission reduction package that was presented in the PDOC for the project which is a major alteration of the permit without appropriate opportunity for the public to comment on the projects offset package. The FDOC for the RCEC allows swapping ERC's with an already approved project the East Altamont Energy Center. The East Altamont energy Center's offset package was designed to mitigate significant impacts under CEQA in the Energy Commission siting process and public review and comment is required.

BAAQMD participated in the California Energy Commission (CEC) process and incorporated aspects of it into its decision. The public reasonably thought that concerns expressed to BAAQMD staff at the CEC Hearing would constitute "participation." BAAQMD subsequently opened and closed its public comment period with one notice in the English newspaper. Instructions were not offered in the notice about how to request a hearing, a telephone number, the amount of PSD increment consumed, or the amount of Emission Reduction Credits issued. Public Comments from the CEC hearing were not incorporated into its decision. Other Agencies were not informed including the affected county (Alameda) and city (Hayward) and the San Francisco Bay Conservation and Development Commission,

with jurisdiction over the adjacent shoreline. The California Department of fish and Game was not notified. East Bay Regional Park Department was not notified. No outreach to the majority, low income and non-English speaking community adjacent to the site occurred. The nearby hospitals were not notified. The current participants and the participants from the previous approval were not noticed.

The CEC approved the project. The CEC physical measurements for notice and environmental Justice issues were from the middle of the project. Under this logic a 2 mile wide facility would need to consider and notice no one. This act reduced the apparent population impact, probably by a factor of five and about 440 acres.

Appeals to the CEC decision are pending in the Supreme Court of California. Parties include the County of Alameda, Chabot College and other groups. Air Quality is the major concern followed by Failure to provide proper notice. BAAQMD issued its Final notice of action despite these actions without notifying any of the parties.

The Final notice of Action includes all of the above. Also, it does not have the address of the facility. The notice states that it is effective on November 1st. It is dated November 30th and Posted December 6th. It was not posted until after numerous comments from me. BAAQMD has resisted my attempts for clarification and participation. We feel at a distinct disadvantage receiving a notice after the fact.

The site is a non-attainment area. The conclusions of the determination of compliance do not include a determination of public benefit.

The EPA relied on incorrect information when it made its request for an informal opinion from USFWS. The impacts of air, noise, light and water pollution were not considered. The measurement for noise impacts was to the Cogswell footbridge at the opposite end of the end of the protected habitat.

The impact in the actual habitat could be 70db. The site is surrounded on at least 180 degrees by wetlands.

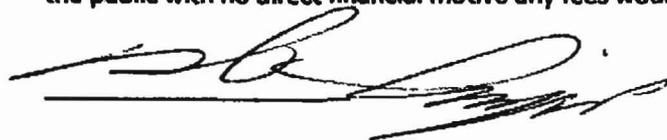
Better technology was recommended by the CEC but not supported by BAAQMD. Determinations were made based upon outdated information. No measure of greenhouse gas emissions was demonstrated.

The cumulative effects; of this project, the Nearby Eastshore Energy Center proposal, and the 2 freeways near both sites was not considered. The Greenhouse gas emissions dwarf the goals of the Districts \$3,000,000 greenhouse gas reduction grant program.

A virtual repeat of the above is now occurring with the Eastshore Energy Center licensing process. BAAQMD received over 1000 public comments and did not elect to have a hearing, consider their concerns or notify the commenter's of further action.

BAAQMD Toxic Air Contaminant (TAC) health risk screening does not including Acrolein, and, at least for Eastshore, their emission factors are much lower than the EPA's HAPs (Hazardous Air Pollutants).

I ask for reasonable fees for participation/intervention in BAAQMD actions including, legal and expert opinions. Should the board not summarily agree to my above requests I ask for time to secure legal counsel and expert testimony for an oral hearing. I also request a waiver of any fees. As a member of the public with no direct financial motive any fees would create a hardship.



Rob Simpson 510-909 1800

27126 Grandview Avenue Hayward California 94542

While my primary means of communication with relevant agencies has been verbal. The following is a record of relevant email communications.

Page 6-8 Emanuelle Rapicavoli/R9/USEPA/US@EPA

Pages 9-18 BAAQMD

Pages 9-23 USFWS

Page 24-25 argument for BACT

Hi Rob,

I did contact BAAQMD and they did verify that they published a public notice in the Oakland Tribune on April 12, 2007 announcing the proposed permit. They issued the permit on November 1st, 2007. The permit became effective one month later and was noticed at that time again in the Oakland Tribune on December 3rd, 2007.

Because we have delegated the issuance of this permit to the BAAQMD, they are responsible for the public notice requirements of this permit. To view our delegation agreement to the BAAQMD, visit:

To appeal the PSD portion of the permit, you can send your written appeal to the Environmental Appeals Board. At this point, EPA region 9 can not opine on these appeals, it is up to the EAB to review your case. Information on how to appeal can be found here:

NOTICE: All filings delivered to the Board by hand or courier, including Federal Express, UPS, and U.S. Postal Express Mail, **MUST** be delivered to the following address:

Colorado Building
1341 G Street, NW
Suite 600
Washington, D.C. 20005

All documents that are sent through the U.S. Postal Service (except by Express Mail) MUST be addressed to the EAB's mailing address, which is:

U.S. Environmental Protection Agency
Clerk of the Board, Environmental Appeals Board (MC 1103B)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460-0001

I hope that is helpful,
Emanuelle Rapicavoli/R9/USEPA/US@EPA 12/12/2007 03:46

Emanuelle,

Any luck finding out if there is a PSD permit and if the procedures are in compliance?

Rob

-----Original Message-----

From: Rapicavoli.Emanuelle@epamail.epa.gov
[mailto:Rapicavoli.Emanuelle@epamail.epa.gov]
Sent: Monday, December 10, 2007 6:31 PM
To: Grandview Realty
Subject: Re: FW: Russell City Energy Center

Hi Rob,

I am still looking into this with the BAAQMD. I'll try to get you a response by Wed. Thanks for your patience,

Emanuelle 12/07/2007 10:04 FW: Russell City Energy Center

Hi Emanuelle,

Have you had any luck obtaining public notices from BAAQMD that comply with 124.10. Can you tell me the date of issuance of the PSD permit.

The other section that I questioned is also from 124.10. oops I said 124.11 below I think that it is all in 124.10
(vii) For PSD permits only, affected State and local air pollution control agencies, the chief executives of the city and county where the major stationary source or major modification would be located, any comprehensive regional land use planning agency and any State, Federal Land Manager, or Indian Governing Body whose lands may be affected by emissions from the regulated activity;

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Wednesday, December 05, 2007 12:54 PM
To: 'rapicavoli.emmanuelle@epa.gov'
Subject: Russell City Energy Center

Hi Emmanuelle,

I did find one of the sections I referenced. Sorry I'll try to be more organized.
Can you tell me if this section applies?
Thank You

Rob Simpson
Hayward Area Planning Association
510-909-1800

124.11 page 280-281

(d) Contents (applicable to State programs, see §§ 123.25 (NPDES), 145.11 (UIC), 233.26 (404), and 271.14 (RCRA))—

(1) All public notices. All public notices issued under this part shall contain the following minimum information:

(i) Name and address of the office processing the permit action for which notice is being given;

(ii) Name and address of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit, except in the case of NPDES and 404 draft general permits under §§ 122.28 and 233.37;

(iii) A brief description of the business conducted at the facility or activity described in the permit application or the draft permit, for NPDES or 404 general permits when there is no application.

(iv) Name, address and telephone number of a person from whom interested persons may obtain further information, including copies of the draft permit or draft general permit, as the case may be, statement of basis or fact sheet, and the application; and

(v) A brief description of the comment procedures required by §§ 124.11 and 124.12 and the time and place of any hearing that will be held, including a statement of procedures to request a hearing (unless a hearing has already been scheduled) and other procedures by which the public may participate in the final permit decision.

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Version: 7.5.503 / Virus Database: 269.16.14/1172 - Release Date:

—Original Message—

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Thursday, December 06, 2007 5:29 PM

To: Brian Bateman

Subject: FW: russell city energy center

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Thursday, December 06, 2007 10:34 AM

To: 'Weyman Lee'

Subject: FW: russell city energy center

2-4-406 Publication, Public Comment and Inspection: **Before** approving the banking of any emission reduction in excess of 40 tons per year of any pollutant or before declaring a moratorium on further banking of emission reductions, the APCO shall cause to be published in at least one newspaper of general circulation within the District, and be sent to any individual submitting a written request to the APCO for notification, **a notice stating the preliminary decision of the APCO to approve the banking of emission reductions** or to declare a moratorium on further banking of emission reductions and inviting written public comment. The APCO shall make available for public inspection at District headquarters the information submitted by

2-2-406 Publication and Public Comment: If the application is for a new major facility or a major modification of an existing major facility, or requires a PSD analysis, or is subject to the MACT requirement, the APCO shall within 10 days of the notification of the applicant, cause to have published in at least one newspaper of general circulation within the District, a prominent notice stating the preliminary decision of the APCO, the location of the information available pursuant to Section 2-2-406, and inviting written public comment for a 30 day period following the date of publication. Written notice of the preliminary decision shall be sent to the ARB, the regional office of the EPA and adjacent districts. A copy of this notice shall be provided to any

person who requests such specific notification in writing. During this period, which may be extended by the APCO, the APCO may elect to hold a public meeting to receive verbal comment from the public. **The written notice shall contain the degree of PSD increment consumed.**

2-3-404 Public Notice, Comment and Public Inspection: The preliminary decision made pursuant to Section 2-3-403 shall be subject to the public notice, public comment and public inspection requirements contained in Section 2-2-406 and 407 of Rule 2.

40cfr51q) *Public participation.* The plan shall provide that—

(1) The reviewing authority shall notify all applicants within a specified time period as to the completeness of the application or any deficiency in the application or information submitted. In the event of such a deficiency, the date of receipt of the application shall be the date on which the reviewing authority received all required information.

(2) Within one year after receipt of a complete application, the reviewing authority shall:

(i) Make a preliminary determination whether construction should be approved, approved with conditions, or disapproved.

(ii) Make available in at least one location in each region in which the proposed source would be constructed a copy of all materials the applicant submitted, a copy of the preliminary determination, and a copy or summary of other materials, if any, considered in making the preliminary determination.

(iii) Notify the public, by advertisement in a newspaper of general circulation in each region in which the proposed source would be constructed, of the application, the preliminary determination, **the degree of increment consumption that is expected from the source or modification, and of the opportunity for comment at a public hearing as well as written public comment.**

(iv) **Send a copy of the notice of public comment to the applicant, the Administrator and to officials and agencies having cognizance over the location where the proposed construction would occur as follows: Any other State or local air pollution control agencies, the chief executives of the city and county where the source would be located; any comprehensive regional land use planning agency, and any State, Federal Land Manager, or Indian Governing body whose lands may be affected by emissions from the source or modification.**

(v) **Provide opportunity for a public hearing** for interested persons to appear and submit written or oral comments on the air quality impact of the source, alternatives to it, the control technology required, and other appropriate considerations.

(vi) Consider all written comments submitted within a time specified in the notice of public comment and all comments received at any public hearing(s) in making a final decision on the approvability of the application. The reviewing authority shall make all comments available for public inspection in the same locations where the reviewing authority made available preconstruction information relating to the proposed source or modification.

(vii) Make a final determination whether construction should be approved, approved with conditions, or disapproved

(vii) **For PSD permits only**, affected State and local air pollution control agencies, the **chief executives of the city and county** where the major stationary source or major modification would be located, any **comprehensive regional land use planning agency** and any **State, Federal Land Manager**, or Indian Governing Body whose lands may be affected by emissions from the regulated activity;

(d) *Contents (applicable to State programs, see §§123.25 (NPDES), 145.11 (UIC), 233.26 (404), and 271.14 (RCRA))* —(1) *All public notices.* All public notices issued under this part shall contain the following minimum information:

(i) Name and address of the office processing the permit action for which notice is being given;

(ii) Name and **address** of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit, except in the case of NPDES and 404 draft general permits under §§122.28 and 233.37;

(iii) A brief description of the business conducted at the facility or activity described in the permit application or the draft permit, for NPDES or 404 general permits when there is no application.

(iv) Name, address and **telephone number** of a person from whom interested persons may obtain further information, including copies of the draft permit or draft general permit, as the case may be, statement of basis or fact sheet, and the application; and

(v) A brief description of the comment procedures required by §§124.11 and 124.12 and the time and place of any hearing that will be held, **including a statement of procedures to request a hearing** (unless a hearing has already been scheduled) and other procedures by which the public may participate in the final permit decision.

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Version: 7.5.503 / Virus Database: 269.16.13/1170 - Release Date: 12/4/2007 10:52 AM

From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]

Sent: Tuesday, December 04, 2007 1:34 PM

To: Grandview Realty
Subject: RE: Russell City

I gave you my answer when we talked before. The District can demonstrate that it complied with the applicable state and federal requirements with respect to this project. I know you may disagree with that, but I think you are incorrect. As I also stated, anywhere where the District did not properly follow a requirement, we will fix any deficiencies. We already did so by publishing a notice of the permit issuance in the newspaper. I do not see any other deficiencies. I also note that many of the regulatory provisions that you've cited do not even apply to PSD permits or District authority to construct permits. I'm really not interested in spending any more time trying to go through each one with you to explain why it does or does not apply.

Sandy Crockett

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Tuesday, December 04, 2007 1:17 PM
To: Alexander Crockett
Subject: RE: Russell City

From: Alexander Crockett [mailto:ACrockett@baaqrmd.gov]
Sent: Tuesday, December 04, 2007 12:56 PM
To: Grandview Realty
Subject: RE: Russell City

I find it ironic that you criticized me for having a "vocation to argue"

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Tuesday, December 04, 2007 12:48 PM
To: Alexander Crockett
Subject: RE: Russell City

From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]
Sent: Tuesday, December 04, 2007 12:39 PM
To: Grandview Realty
Subject: RE: Russell City

As we have discussed, we each have our respective positions on the propriety of the notice that was given for these proceedings, and there would be little use in spending more time going around and around debating them further.

Sandy Crockett

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Tuesday, December 04, 2007 12:32 PM
To: Alexander Crockett
Subject: RE: Russell City

From: Alexander Crockett [mailto:ACrockett@baaqmd.gov]
Sent: Tuesday, December 04, 2007 12:23 PM
To: Grandview Realty
Subject: Russell City

Mr. Simpson:

I got your voice mail message regarding the Russell City project. Yes, I received your emails. Thanks for your input.

Sandy Crockett _____

Alexander G. Crockett, Esq.

Assistant Counsel

Bay Area Air Quality Management District

939 Ellis Street

San Francisco, CA 94109

Phone: (415) 749-4732

Fax: (415) 749-5103

I think we've already thoroughly discussed the issues of substance in our phone conversations last week. As you know, the District and the Energy Commission did consider the fast-start technology and determined that it was not appropriate for this proposed facility. The cumulative impacts of this and other projects were also evaluated in great detail. And the public and interested entities were given notice of the permitting action and an opportunity to comment. You have a right to your opinion on these points, but I don't think it would be a good use of our time for us to continue to restate our respective positions.

As for your personal insinuations, I do not intend to dignify them with a response.

Sandy Crockett

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Monday, December 03, 2007 1:25 PM
To: Alexander Crockett
Cc: Public Records; Weyman Lee
Subject: RE: PSD Permit Appeals

From: Alexander Crockett [mailto:ACrockett@baaomd.gov]
Sent: Monday, December 03, 2007 1:16 PM
To: Grandview Realty
Cc: Public Records; Weyman Lee
Subject: RE: PSD Permit Appeals

To review documents related to the Russell City project, you will need to schedule a time with our public records coordinator. Please send her a public records request using the link on our homepage -- it's at the top in the middle of the page. Specify the category of documents you want to look at, and then you can set up a time with her to do so. I'm also cc'ing her on this email so she'll know to expect your request.

To have you included on a mailing list for information about the project, I am also forwarding your email to Weyman Lee, the permit engineer for the project.

Sandy Crockett

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Monday, December 03, 2007 12:04 PM
To: Alexander Crockett
Subject: RE: PSD Permit Appeals

[Faint, mostly illegible text, likely a body of an email or a document page.]

From: Alexander Crockett [mailto:ACrockett@baaomd.gov]

Sent: Friday, November 30, 2007 12:31 PM **To:** Grandview Realty

Subject: PSD Permit Appeals Here is another document you may be interested in. This is a layperson's guide to appealing the issuance of federal permits at the Environmental Appeals Board in Washington, DC. Page 5 discusses PSD permits and the EAB's authority as the appellate body for these permits. Pages 23-24 discuss the requirement that someone participate in the PSD permitting process – by submitting written comments on the proposed PSD permit – in order to be able to pursue an appeal. Someone who did not participate by submitting comments has not right to appeal the permit.

Sandy Crockett

Alexander G. Crockett, Esq.

Assistant Counsel

Bay Area Air Quality Management District

939 Ellis Street

San Francisco, CA 94109

Phone: (415) 749-4732

I'm not sure that you have the correct regulatory requirement here, but the substance is correct –our agency is required to give adequate public notice and an opportunity to comment before taking permit actions like issuing a PSD permit. We did that here – we gave notice of the proposed issuance of a PSD permit for this facility to the public and to EPA and other agencies, and we invited comment on the proposed permit. We satisfied all applicable procedural requirements for issuance of this permit.

Sandy Crockett

Alexander G. Crockett, Esq.

Assistant Counsel

Bay Area Air Quality Management District

939 Ellis Street

San Francisco, CA 94109

Phone: (415) 749-4732

Fax: (415) 749-5103

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Friday, November 30, 2007 11:04 AM**To:** Alexander Crockett

Subject: notice required

This section only speaks to public notice, notice to affected agencies is also a concern.

Rob

(h) *Public participation.* Except for modifications qualifying for minor permit modification procedures, all permit proceedings, including initial permit issuance, significant modifications, and renewals, shall provide adequate procedures for public notice including offering an opportunity for public comment and a hearing on the

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Environmental Protection Agency § 70.8

draft permit. These procedures shall include the following:

(1) Notice shall be given: by publication in a newspaper of general circulation in the area where the source is located or in a State publication designed to give general public notice; to persons on a mailing list developed by the permitting authority, including those who request in writing to be on the list; and by other means if necessary to assure adequate notice to the affected public;

<<40cfr124.15.url>> Mr. Simpson:

I found the EPA regulatory requirement for notice of the final issuance of a federal permit (which the PSD permit is). It is in 40 C.F.R. section 124.15(a), a PDF copy of which can be found at the link below. As you will see, notice of the final issuance needs to be sent to the applicant and anyone who submitted comments on the proposed permit. There is no requirement for general public notice such as publication in a newspaper, on a website, or to the CEC's service list.

.gov/cfr_

2007/julqtr/pdf/40cfr124.15.pdf

Sandy Crockett

Alexander G. Crockett, Esq.
Assistant Counsel
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
Phone: (415) 749-4732
Fax: (415) 749-5103

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.16.11/1161 - Release Date: 11/30/2007

12:12 PM

---Original Message-----

From: Weyman Lee [mailto:Weyman@baaqmd.gov]

Sent: Thursday, December 06, 2007 9:46 AM

To: grandviewrealty@comcast.net

Cc: Bob Nishimura

Subject: RE: Russell City

The analyses were submitted by Calpine in their Application for Certification (AFC). You should also read the evaluation of the issues by the CEC in the staff assessment (PSA and FSA). These documents are available at the CEC website.

Weyman

-----Original Message-----

From: Bob Nishimura

Sent: Wednesday, December 05, 2007 2:11 PM

To: Weyman Lee

Subject: FW: Russell City

Weyman,

Do you want to answer Mr. Simpson statement?

Bob

-----Original Message-----

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]

Sent: Wednesday, December 05, 2007 1:23 PM

To: Bob Nishimura

Subject: Russell City

Can you also direct me to the following analysis

2-2-401 Application: In addition to the requirements of Regulation
2-1-402, applications for

authorities to construct facilities subject to Rule 2 shall include all
of the following:

401.1 For new facilities, which will emit, and for a modification which
will increase

emissions more than 100 tons per year of carbon monoxide or 40 tons per

year of either precursor organic compounds or nitrogen oxides, an
analysis

of alternative sites, sizes, production processes, and environmental
control

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techniques for such proposed source which demonstrate that benefits of the

proposed source significantly outweigh the environmental and social costs

imposed as a result of its location, construction or modification.

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.503 / Virus Database: 269.16.14/1172 - Release Date:

12/5/2007 8:41 AM

Dear Mr. Olah,

I have read with great concern the letter from the EPA to you regarding the Russell City Energy Center in the City of Hayward.

The letter incorrectly identifies the project. It states that "the nearest tidal marshes are 1400 feet to the south and separated from the project by distribution warehouses. In its new location Russell City would avoid impacts to seasonal wetlands and the protected species mentioned above."

The CEC staff report more correctly identifies the location as follows;

(see LAND USE Figure 1). It is immediately adjacent to salt ponds and levees, designated as Baylands in the City of Hayward General Plan, and the City of Hayward flood control channel. All areas to the north, east, and south of the project area are utilized for mixed industrial and commercial purposes. Baylands west of the project site have been set aside by the City of Hayward as Open Space and are included in the wetlands, marsh, and protected upland areas being restored under direction of the Hayward Area Shoreline Planning Agency (HASPA).

JUNE 2007 4.5-7 LAND USE

The attachment to the letter to you includes excerpts from Calpine's application. The area map incorrectly identifies the Eden Landing Preserve as "salt ponds"

The Calpine application identifies the elimination of mitigation Bio-10 but does not address the big issues identified in the final decision, elimination of the condition requiring consultation and a biological opinion from you, the Army Corp. of Engineers, and the San Francisco Bay Water Control board. They have also omitted Fish and Game SFBCDC and anyone else who may be contrary to licensing a

thermal power plant adjacent to sensitive wetlands. They have also eliminated many of the air quality mitigations.

This project will have direct negative unmitigated effects upon endangered wildlife

This decision of the CEC is being appealed by multiple parties including the county of Alameda, California pilots association, Chabot College and numerous environmental groups.

The Hearing is tomorrow at 10 AM at the CEC. Please attend to reopen the evidentiary hearing.

The following sections have been deleted from the final decision apparently without notice or regard for you.

BIO-6 through BIO-10, Deleted.

USFWS BIOLOGICAL OPINION

BIO-6 Formal consultation between the USFWS and USEPA shall be completed, and the project owner shall implement all terms and conditions of the resulting Biological Opinion.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner must provide the Energy Commission CPM with a copy of the USFWS Biological Opinion. All terms and conditions of the Biological
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Opinion will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

U. S. ARMY CORPS OF ENGINEERS SECTION 404 PERMIT

BIO-7 The project owner shall acquire and implement the terms and conditions of the USACE Section 404 permit.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner shall submit to the CPM a copy of the permit required to fill on-site wetlands. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD CERTIFICATION

BIO-8 The project owner will acquire and implement the terms and conditions of a San Francisco Bay Regional Water Quality Control Board Section 401 State Clean Water Act certification.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner will provide the CPM with a copy of the final Regional Water Quality Control Board certification. The terms and conditions of the certification will be incorporated into the project's Biological Resources Mitigation Implementation and Monitoring Plan.

STORM WATER MANAGEMENT PLAN

BIO-9 The project owner shall develop a RCEC Storm Water Management Plan in consultation with the U.S. Fish and Wildlife Service, East Bay Regional Parks District, Hayward Area Parks and Recreation District, San Francisco Bay Regional Water Quality Control Board, City of Hayward Public Works Department, Alameda County Flood Control District and Staff.

Verification: The project owner will submit to the CPM a Storm Water Management Plan at least 60 (sixty) days prior to the start of any site mobilization activities (See Soil and Water Resources, Condition of Certification Soil & Water-3). The final approved plan will also be contained in the RCEC Biological Resources Mitigation Implementation and Monitoring Plan.

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HABITAT COMPENSATION

BIO-10 The project owner shall provide 26.19 acres of habitat to compensate for the loss of upland, freshwater seasonal wetlands. To mitigate the permanent and temporary loss of habitat, the project owner shall:

1. Purchase 26.19 acres of habitat adjacent to the proposed RCEC site; 2. Donate the 26.19 acres of habitat to the East Bay Regional Park District ("EBRPD"); 3. Assist in arranging a long-term lease to the EBRPD for 30 acres of salt marsh habitat owned by the City of Hayward; 4. Provide a suitable endowment fund to the EBRPD to manage the proposed habitat compensation and the City of Hayward property in perpetuity; 5. Implement the terms of the Agreement between EBRPD and the Russell City Energy Center LLC, to the extent such terms are consistent with the terms and conditions of this decision; and 6. Record, with the deed to the 26.19 acres of habitat compensation, an appropriate instrument containing such covenants as will benefit EBRPD and restrict use of the land as an enhanced wetland consistent with the terms and conditions of this decision. Such restriction shall be for the duration of the enhancement and monitoring activities specified in Section 1.2 of the Agreement between EBRPD and the Russell City Energy Center LLC.

Verification:

1. No less than 30 days prior to any site mobilization activities, the project owner shall provide written verification to the CPM that the required habitat compensation has been purchased and the restricting covenants recorded.
2. No more than 90 days after completion of the enhancement actions specified in Section 1.2 of the Agreement between the Russell City Energy Center LLC and the EBRPD, and their approval by the regulatory agencies, the project owner must provide written verification to the CPM that the Applicant has provided to the EBRPD a fee simple deed to the 26.19 acre parcel.
3. No less than 30 days prior to the start of construction of permanent structures, the project owner shall provide written verification to the CPM that the Applicant has paid to the EBRPD the first payment of \$300,000. Thereafter, as each subsequent payment is made to the

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EBRPD in accordance with the terms of the Agreement between RCEC and EBRPD, the project owner shall provide written verification to the CPM within 30 days after each payment is made.

4. BIO-10 is independent of, and is not intended to change, the contractual rights and obligations of the Agreement between RCEC and EBRPD.

Rob Simpson, Real Estate Broker

Grandview Realty 11/2/2007 11:04 AM

Application Number 15487 Facility ID # B3161.

One basis for the appeal relates to violations of District rules and Regulations in the analysis and issuance of the Authority to Construct. Specifically the petitioner alleges that the District violated section 2-2-301 by failing to require Best Available Control Technology for the project. Outdated information was used in determination The EPA models SCREEN3 and ISCST3 were used in the air quality impacts analysis based upon 1990-1994 ozone and meteorological data. Reference is made to NO2 concentrations for the last five years, 1996-2000. The BACT determination stems from a 1999 report from Onsite Sycom for GE turbines not the approved Westinghouse turbines. It fails to provide proven present technology that would limit the facilities potential high NOx emissions that occur during the power plants startup and shutdown cycles. The hourly emissions during startup and shutdown are much greater than during normal operation since the plants SCR and ammonia injection system are not operating at optimal conditions. The resulting emissions could have a significant effect on ozone and air quality in the Bay Area air basin. The projects emissions combined with background NO2 levels also has the potential to violate the new ARB NO2 standard promulgated on February 23, 2007. If this project was needed it should have been required to utilize fast start technology which can lower the projects startup time from six hours to one hour and lessen the projects proposed cold start NOx emissions from 480 pounds to 22 pounds and the warm start emission from 240 to 28 pounds per event. This technology has been utilized in practice at the Palomer Power Project in Escondido and is approved for The El Segundo facility. The technology is cost effective and utilized in practice. The CEC staff recommended this technology. District Staff was informed on the merits of the fast start technology but failed to include it in the BACT analysis or require it for the project.

Petitioners also allege that the Health Risk assessment is inadequate since the assessment fails to analyze the impacts of some of the toxic air contaminants.

There is also significant opportunity for bio-sequestration of emissions in the area.

**BEFORE THE HEARING BOARD
OF THE
BAY AREA AIR QUALITY MANAGEMENT DISTRICT
STATE OF CALIFORNIA**

APPEAL

In the Matter of the Appeal of

DOCKET NO.

Russell City Energy Center

Authority to construct

Application Number 15487

Facility ID # B3161

VISUAL RESOURCES - FIGURE 16

Russell City Energy Center Project - Existing View from Cogswell Marsh Footbridge

JUNE 2007



VISUAL RESOURCES

Exhibit list

Notices dated April 2, 2007, November 20, 2001 and November 30, 2007(Exhibit 1).

by Sandy Crockett on May 8, 2007. (Exhibit 2).

Public comments, district response and emails (Exhibit 3)

posted for viewing CEC May 3, 2007. (Exhibit 4)

the County of Alameda filed a petition to reopen the CEC proceedings (Exhibit 5)

District has compliance violations that are documented in its 2001 Calpine file (Exhibit 6)

Permit and Check to the District for \$249,300 was from Calpine (Exhibit 7).

Air Quality tables (exhibit 8)

publication, the District's website (Exhibit 9)

Tim Eichenberg Chief counsel San Francisco Bay Conservation And Development Commission BCDC (Exhibit 10)

re-delegation agreement. (Exhibit 11)

endangered species maped (exhibit 12)

Weyman lee summarizing in writing my comments. (Exhibit 13)

AIR QUALITY CEC Twan Ngo 4.1-22 (Exhibit 14).

Mr. Monasmith's Emails (exhibit 15)

The docket log, from the original proceedings and service list (exhibit 16)

letter for the air district's Board of Directors (Exhibit 17)

The El Segundo facility (exhibit 18)

the CEC to the Air district, dated May 29, 2007 (Exhibit 19)

The letter from The EPA to USFWS and response from USFWS (Exhibit 20)

Exhibit list

AFC biological and land use sections (Exhibit 21)

The 2007 CEC staff report noise and vibration section (Exhibit 22)

**IMPACTS OF NITROGEN DEPOSITION ON CALIFORNIA
ECOSYSTEMS AND BIODIVERSITY (Exhibit 23)**

**Testimony of Sandra Witt DrPH Director of Planning, policy and Health
Equity for the Alameda County Public Health Department (Exhibit 24)**

**California Regional Water Quality Control Board letter Dated December 20,
2006 (Exhibit 25)**

**2002 SUMMARY OF AIR QUALITY IMPACTS ANALYSIS and the 2007
version (Exhibit 26)**

The applicable standard of review by the Board in matters concerning procedural error by an agency is whether the responsible agency's action was arbitrary and capricious. My argument that the notice of the draft PSD permit was inadequate invokes this arbitrary and capricious standard of review. *Kern County Farm Bureau v. Allen*, 450 F.3d 1072, 1076 (9th Cir. 2006); *see also* "[A] decision made without adequate notice and comment is arbitrary or an abuse of discretion." *Natural Res. Def. Council v. EPA*, 279 F.3d 1180, 1186 (9th Cir. 2002) (*citing* 5 U.S.C. § 706(2)(A))(holding that EPA failed to provide adequate notice and opportunity for comment prior to issuing final NPDES permit). Significantly, the adequacy of the agency's notice and comment procedure is determined without deferring to an agency's own opinion of the opportunities it provided. *Kern County Farm Bureau*, 450 F.3d at 1076; *Natural Res. Def. Council*, 279 F.3d at 1186.

I. The District's Failure to Provide Notice of the Draft Permit Is a Violation of Federal Notice Requirements and Prejudicially Harmed Me Because It Prevented My Participation in the Permitting Process

a. The District failed to comply with the requirements of 40 C.F.R. 124.10.

I have placed myself in a position to be made aware of any notice issued relating to RCEC due to my extensive involvement in organizations that meet the standards outlined in 40 C.F.R. 124.10 as meriting notice. Had the District complied with the requirements of Part 124, I would have received notice. It is disingenuous of the District to violate public notice requirements and then argue my appeal is precluded as a result.

Pursuant to the Re-Delegation Agreement between the Environmental Protection Agency ("EPA") and the District, the District must comply with the notice requirements of both its own Regulation 2, Rule 2, as well the requirements of 40 CFR 124.¹ Section 124.10, which governs the public notice of permit actions and public comment period, requires that public notice be given when a draft permit has been prepared. Furthermore section 124.10 details how the notice

¹ Section III, ¶ 2 of the Re-Delegation Agreement states: "The District shall issue PSD permits under this Agreement in accordance with the PSD elements of the District's Regulation 2, Rule 2 Elements of Regulation 2, Rule 2 relating to state law requirements inconsistent with . . . 40 CFR 52.21 and 124. . . shall not apply to PSD permits under this Agreement." The requirements for publication are not inconsistent and therefore Regulation 2, Rule 2 applies to the PSD permit.

is to be provided, to whom it will be provided and how the District will generate the list of people to inform. The section states in relevant part:

“(c) Methods. Public notice of activities . . . shall be given by the following methods: (1)

By mailing a copy of a notice to the following persons;

(vii) For PSD permits only, affected State and local air pollution control agencies, the chief executives of the city and county where the major stationary source of major modification would be located, any comprehensive regional land use planning agency. . .

(ix) Persons on a mailing list developed by:

(B) Soliciting persons for “area lists” from participants in past permit proceedings in that area; and (C) Notifying the public of the opportunity to be put on the mailing list through periodic publication in the public press . . .” (40 CFR 124.10).

I serve on the board of directors for the Hayward Area Planning Association (“HAPA”) and have been appointed to act on its behalf in these proceedings. (Simpson Decl. ¶) It is a comprehensive regional land use planning agency serving the Hayward Area. (Simpson Decl. ¶) Consequently, HAPA should have received notice pursuant to 40 C.F.R. 124.10(vii). I have participated in CEC hearings through our HAPA attorney Jewell Hargleroad.

My environmental efforts have also earned me an appointment by the Mayor and City council of Hayward to the City of Hayward’s Keep Hayward Clean and Green task force where I serve as the Chairman of the Sustainability Committee. We passed a resolution against the facility. Had the City of Hayward been informed of the District’s actions the Committee would have likely commented during the public comment period. The District did not even provide notice of the draft permit to the Board of Supervisors of Alameda County, Decl. of Gail Steele in violation of 40 C.F.R. 124.10(c)(1)(vii). Furthermore, many people and groups participated in the 2002 permitting proceeding for RCEC before the District, including Communities for a Better Environment. The District, however, did not solicit persons for “area lists” from these past permit proceedings in the area. The District did not even notice interested parties from the original application like Communities for a Better Environment (decl. Shana Lazerow) and parties clearly interested in Hayward proceedings like Mike Toth as identified by Sandy Crockett

on May 8, 2007 (Exhibit 2). It is notable that Mr. Crockett's actions demonstrated in the above exhibit are not an attempt at community outreach. They are more akin to counterintelligence.

Decl. Toth

The District received 605 public comments regarding Calpine's project and The Eastshore Energy Center. They placed them all in the Eastshore file. They responded to them on 10/24/07 one week before the permitting action, about five months after the comments were made, referencing Russell City Energy Center 5 times in the letter. They gave no notice of the permitting action to occur in one week and offered no opportunities to be on a mailing list. Public comments, district response and emails (Exhibit 3) decl. Decl. Finn, Watters, Chavez, Silva, LePell, Pacheco, Forsyth, Kramer. All commenters deserve notice of the permitting action. I would like the opportunity to provide a brief on the merits of this letter.

the District created no mailing list and did not notify the public of the opportunity to be put on such a list. The District's disregard for these statutory requirements resulted in harm to myself and the public because we were unaware of the draft permit and any comment period or of the ability to ask for a public hearing.

b. The District cannot satisfy the requirements of Part 124 by providing notice of the draft permit to the CEC and failing to provide evidence that CEC distributed the notice.

Rather than complying with section 124 as the District is required to, the District says that it gave sufficient notice to the public because it sent a notice to the CEC.² The District seems to contend that it delegated its authority, for purposes of service of notice at least, to the CEC.

No evidence that the CEC actually provided the Preliminary Determination of Compliance ("PDOC") or Final Determination of Compliance ("FDOC") to any of the interested parties was offered beyond the declaration of Weyman Lee: "The letter to the California Energy Commission also caused a copy of the PDOC/PSD Permit to be mailed to each of the interested parties on the Energy Commission's service list for the Project, *I am informed and believe*, as it is the practice of the staff . . . to mail copies of all written materials." (Lee Decl., ¶ 2) (emphasis

² The District was required to give notice to the CEC as an agency pursuant to 40 C.F.R. 124.10 (b)(ii). That section merely identifies agencies requiring notice, it does not indicate that the District's responsibility terminates there.

added). The CEC may not have served anyone. Therefore, the District cannot argue that its distribution to the CEC resulted in distribution to the public.

Furthermore, the notice and PDOC provided to the CEC on April 2, 2007 was not posted for viewing until May 3, 2007. (Exhibit 4) page 4 Arguably, even the CEC was unaware of the comment period because its comments on May 29 were “late comments” according to the District.

Significantly, the County of Alameda filed a petition to reopen the CEC proceedings (Exhibit 5) based largely on the failure of the CEC to provide notice to the County of its action. The District issued the permit prior to the CEC’s decision not to reopen the proceedings. Consequently, the County appealed to the Supreme Court of California. Considering the level of controversy surrounding this facility the only explanation for the dearth of public comment on the draft permit is that the notice was defective.

II. The Untimely Notice the District Provided Was Substantially Deficient Because It Did Not Promote Participation.

Significantly, the District failed to include either notice in the 205 pages of its response and declarations. I have provided copies of both the draft and final notices (Exhibit 1).

The numerous deficiencies in these notices were not harmless error. The District is tasked with providing accurate information to the public so that it may participate in a meaningful manner. The regulations governing notice are meant to safeguard this process and ensure open government. The notices provided by the District thwarted this goal.

a. The true identity of the applicant was not revealed in the notice.

Federal regulation 40 C.F.R. 124.10(d)(1)(ii) provides that all public notices must contain the “[n]ame and address of the permittee or permit applicant, and if different, of the facility or activity regulated by the permit. . . .” Importantly, the notice does not identify the applicant as Calpine Corporation and fails to provide Calpine’s address. The notice references the “Russell City Energy Center,” and gives the address of the proposed facility. It is significant that the regulation explicitly requires that if the name of the facility would not reflect the true identity of who will be in charge of the facility, such identifying information must be provided. It was not

in this case. This omission is harmful because Calpine was in bankruptcy and has incurred multimillion dollar fines by the state Attorney General's office for manipulating the energy market. Other enforcement actions were also not disclosed. Furthermore, the District has compliance violations that are documented in its 2001 Calpine file (Exhibit 6). The District may argue that the applicant is Russell City Energy Center but they sent the permit to Calpine at Calpine's otherwise undisclosed address and the Check to the District for \$249,300 was from Calpine (Exhibit 7). These deficiencies resulted in prejudice because there is not sufficient evidence that the public was aware of Calpine's involvement.³

b The location of the facility was not adequately identified in the notices.

In bold on the notices is Russell City Energy Center. The "final notice" does not contain an address for the facility. The name Russell City is patently deceptive. There is no city named Russell in the Bay Area. These deficiencies resulted in prejudice because there was not sufficient evidence that the public was aware of the location.

c. The notice of the draft permit was insufficient to inform the public of other procedures by which it could participate in the final permit decision.

The District's notice of the draft permit is deficient under section 124.10. Subsection (d)(1)(v) of this section requires that the notice provide a "brief description of the comment procedures required by §§ 124.11 and 124.12 and the time and place of any hearing that will be held, including a statement of procedures to request a hearing . . . and any other procedures by which the public may participate in the final permit decision." Sections 124.11 and 124.12 detail that in order to request a hearing it must be in writing, barring that, the election to hold a hearing is at the discretion of the District. The notice provides no statement of procedures to request a hearing.

This resulted in harm because those of us who participated in the CEC proceedings were under the impression that they were joint proceedings with the District as part of the coordinated and streamlined permitting process. This extensive oral participation, however, did not register

³ The District may argue that the applicant is Russell City Energy Center, but they sent the permit to Calpine at Calpine's otherwise undisclosed address, which is different from the project address (Exh. 4). The check for \$249,300 to the District was from Calpine (Exh. 5).

as “a significant degree of public interest in” the permit, *See* 40 C.F.R. 124.12(a)(1), simply because we did not know to *write* to the District of our expectation of a public hearing. This blatant disregard of a mandate to provide information to the public is not harmless error.

The federal regulations further mandate that all public notice include the “[n]ame, address and telephone number of a person from whom interested persons may obtain further information. . . .” 40 C.F.R. 124.10(d)(1)(iv). A phone number to obtain further information was not disclosed. This requirement is meant to facilitate the dissemination of information to the community, however, the District’s notice eliminates one of the ways a community member without access to the internet may have pursued information regarding the facility.

The notice also violated the District’s Regulation 2-2-405 because it did not include the degree of PSD increment consumed. A PSD increment is the measurement of “maximum allowable increase[s] in the concentration of a particular contaminant.”⁴ This information is important in the notice of the draft permit because it details the degree of impact the facility will have. The CEC completed this analysis in Air Quality table 3, notable is the use of the old Federal pm2.5 standard. Use of the new standard would demonstrate existing non-attainment increased to a level of 121 percent of standard. The proposed Eastshore Energy Center CEC proceedings disclose the current standard and demonstrate a cumulative impact of 175% of standard. Disclosure of this information would be of paramount information to the public and affected agencies. Air Quality tables (exhibit 8)

The notice does not identify a “draft PSD permit”

Finally, the notice of the draft permit merely invited written public comment and did not detail the procedure for a public hearing. The notice failed to mention public hearings and it did not state that District Regulation 2-2-405 would explain to the public in detail the District’s procedure for a public hearing. Consequently, the notice was deficient under District Regulation 2-2-405 and the effect of the numerous deficiencies was to prevent meaningful public participation.

⁴ David Wooley and Elizabeth Morss, *Clean Air Act Handbook*, Section 1:119

d. Publication of the notices in the Oakland Tribune violated the District's regulations requiring notice.

The newspaper in which the notice was published – the Oakland Tribune – is not a newspaper of general circulation “within the District.” The Oakland Tribune is a newspaper of general circulation “within the City of Oakland” and “within the County of Alameda,” as the District acknowledges. It is not a newspaper of general circulation “within the District,” which is comprised of seven counties and portions of two additional counties. Cal. Health & Safety Code § 40200.

The District regulations requiring notice in a newspaper of general circulation within the District must be interpreted to mean newspapers of general circulation covering the District. Otherwise, any notice regarding PSD permits, which by their very nature affect regional air quality within the District, would not reach the District residents who may be interested in commenting on the facility.

Tellingly, the notice in the Oakland Tribune was even insufficient to inform Hayward residents as it was not published in the Daily Review, the adjudicated newspaper of general circulation for the city of Hayward where the facility is proposed.

Because the District failed to comply with its own regulations regarding notice of the final permit, the 30-day appeal period has not begun to run.

III. The 30-Day Appeal Period Has Not Begun to Run and, Even if the Newspaper Notice Sufficed as Public Notice, My Appeal to the Board Was Timely Filed on January 3, 2008 Since the Newspaper Notice Ran on December 6, 2007.

The District's attempt to prevent this appeal on the grounds of timeliness must fail because the 30-day period has not begun to run. First, the 30-day period has not begun to run because the notice of the District's action on the final permit was defective. The notice of the final permit was defective because the list of those who are required to receive notice of the final permit is determined by those who comment on the draft permit. 40 C.F.R. § 124.15. As I argued earlier, because the District failed to provide notice of the draft permit – and since the commenters to the draft permit deserve notice of the final permit under 40 C.F.R. § 124.15 – the

District's failure to provide notice of the draft permit fundamentally affected the identity of the persons who should have received notice of the final permit. Thus, the District's notice of the final permit was defective and the appeal period has not yet run. Second, the District's newspaper notice was also defective within the meaning of the District's rule, and therefore the 30 days have not begun to run. Lastly, I filed my appeal within 30 days of December 6, 2007, when the District published the notice of the final permit in the Oakland Tribune. Therefore, if the 30 days did begin to run, I filed my appeal on time by filing before January 7, 2008.

a. The District's notice of the final permit did not comply with section 124.

Under 40 C.F.R. 124.19(a), the 30-day period within which a person may request review of a PSD permit "begins with the service of notice of the Regional Administrator's action unless a later date is specified in that notice." Since the District issued the PSD permit under its delegated authority, the "Regional Administrator" means the chief administrative officer of the delegate agency. 40 C.F.R. 124.41. Notice of the final permit decision must be provided to "the applicant and each person who has submitted written comments or requested notice of the final permit decision." *Id.* § 124.15(a).

Because the District failed to notice the draft permit properly (see my earlier argument), members of the public, including me, were unable to submit comments to the draft. Thus, any attempt on the District's part to give notice of the final permit failed to comply with section 124.

Furthermore, 40 C.F.R. 124.15(a) requires the District to provide a reference to the procedures for appealing the final decision. The purported notice does not contain any such information (defeating the purpose of providing the notice arguably). In addition, my personal attempts to acquire such information from the District were unsuccessful. Counsel for the District assumed an adversarial position and informed me that he could not tell me what the procedures to appeal were, nor did he provide proper citation to the relevant federal regulations in complete contravention of 40 C.F.R. 124.15(a). (Simpson Decl. ¶) The district received over 600 public comments regarding Eastshore and Calpine's project that they only filed in the Eastshore Energy proceeding. They responded to the comments nearly 5 months later on October 24 1 week before the Final permit was issued without noticing them of the action.

Because the District failed to give notice in the manner section 124 requires, the 30-day period has not begun to run.

b. Because I filed my appeal on January 2, 2008, before 30 days from December 6, 2007, when the District published its newspaper notice, my appeal is timely.

As the District acknowledges, the notice in the Oakland Tribune was not published until December 6, 2007. (Resp't Brf. p.7) (In addition, consistent with that date of newspaper publication, the District's website (Exhibit 9) indicates that notice of the permit was provided on December 6, 2007.) Thus, even if the notice in the Tribune sufficed as notice under section 124, any appeal filed before January 7 (January 5 and 6 being weekend days) should be considered timely. Since my appeal was filed on January 2, 2008, my appeal is timely.

c. The District's argument that the 30-day period began to run on November 1 or November 29 does not have any merit.

The District argues that November 1, 2007 is the commencement of the time for my appeal because the District mailed the notice to the applicant on that day. Mailing the notice to the applicant does not constitute public notice under Regulation 2, Rule 2. If the Board were to accept the District's argument, the 30-day period would run regardless of whether anyone other than the applicant received notice. The purpose of the public notice requirement, however, is to let persons other than the applicant know about the permit to enable public participation.

The Board should similarly dismiss any arguments that the 30-day appeal period ran they claim that I received a fax from the District on November 29, 2007. I received no such fax. (See Simpson Decl.)

The District has no one but itself to blame for December 6th being the commencement of the appeal period because it tried to prevent anyone but the applicant from being able to appeal 30 days from the November 1, 2007 service of notice. An appeal period must be a uniform period of time and the District cannot manipulate this uniformity to time people out of their right to appeal.

Newspaper publication does not satisfy the requirements of 40cfr124.10 as it does not serve the USFWS for concurrence with the Endangered Species Act, The San Francisco Bay Conservation and Development Commission For Concurrence with the Coastal Zone Management Act or The Chief executives of the City or County or any state or Federal land managers as would be consistent with the Clean Air Act. email correspondence with Coastal zone manager Tim Eichenberg Chief counsel San Francisco Bay Conservation And Development Commission BCDC (Exhibit 10) confirming lack of notice.

Permitting history

The District states; "The Permitting History of the Russell City Energy Center The District and CEC followed these procedures in this case. The facility was initially licensed in 2002, but before construction the site was relocated and so the facility had to be re-licensed and re-permitted."

The facility was never licensed or permitted by the EPA in 2002. No conforming public notice was made at that time by the district, and no PSD permit was issued at that time. This is confirmed in the re-delegation agreement. (Exhibit 11)The permit was not issued due to the necessity of a USFWS formal biological opinion which never occurred. This opinion was necessary pursuant to the Endangered Species Act and acknowledgment that the project could have a significant negative impact on adjacent endangered species and habitats.

While the relocation is the only stated reason for the re-license and re-permit, the CEC record indicates extensive information of even greater significance than the relocation including equipment changes, the emission profile, operating procedure, removal of mitigations, etc. The plant went from a Base-load facility to one that is licensed to start and stop on a daily basis. The new site is closer to a protected habitat and has a greater impact upon endangered species mapped (exhibit 12)

Contemporaneous Emission Reduction Credits .

The notice states that "The emission increases of nitrogen oxides and precursor organic compounds associated with this project will comply with the emission offset requirements of District Regulation 2-2-302." It provides no detail of the credits. They were not contemporaneous as defined by the district. "2-2-242 Contemporaneous: The five year period of time immediately prior to the date of application for an authority to construct or permit to operate." Page 18 and 19 of the Amended FDOC disclose credits from 1984, 1985, 1987, 1996, 1999, and the closest to contemporaneous being from the year 2000. This information could certainly have raised concern in the community and affected agencies. The EPA has expressed concerns with older Emission credits as have many other who subscribe to logic as they provide no present relief. The following excerpt is from the CEC proceedings Staff received an oral comment from Mr. Mike Sweeney, the Mayor of the City of Hayward, regarding the project. Mr.

Sweeney, at the December 15, 2006 Informational Hearing, expressed concerns over the impacts of the project's emissions and net air quality benefits of the emission mitigations on the local air quality.

Substantial Changes between the PDOC and the FDOC

The District claims that there were no substantial changes between the PDOC and the FDOC and minimizes the effects of the change in the credits. The final permit provided substantial changes to the draft permit including ERC exchanges between an already certified project the East Altamont Energy Center and Calpine's Hayward plan without noticing by the district of the ERC swap between the two projects. The location of the ERC's in the East Altamont Energy Center was a disputed topic since the project sat on the border of the San Joaquin valley district and the District. Both the mitigation agreement between Calpine and the San Joaquin Valley Air Pollution Control District and the CEC's CEQA type evaluation revolved around the location and the timing of the ERC's offered for the East Altamont Center.

Another major change in the FDOC which should have triggered public notice is the substitution of POC Emission Reduction credits for NOx Emission Reduction Credits. The overreliance on POC credits fails to mitigate the Nitrogen deposition on sensitive habitats and also increases the formation of secondary particulate due to the reactivity of NOx emissions with particulate precursors in the atmosphere.

| | PDOC | FDOC |
|-----|------|------|
| NOx | 57% | 26% |
| POC | 43% | 74% |

()

The district changed the ERC package for the East Altamont Energy Center in the FDOC without notification of the parties to the EAEC project and the San Joaquin Valley Pollution Control District who also had a separate mitigation agreement which required governing board approval with Calpine based on the ERC package in the EAEC Final Determination of Compliance.

"The District and CEC followed these procedures in this case."

I offer the handwritten notes of Weyman lee summarizing in writing my comments. (Exhibit 13) One of which 11/1 states "Notification Adequate?" referencing my concerns about receiving legal notification. My BACT concerns are also summarized. Perhaps in response to my concerns 11/3/07 notes summarize Mr. Lee's conversation with Twan Ngo CEC **"in hindsight, should have made provision in condition for alternative plan."** This refers to the CEC recommended and approved plan. AQ-SC10 AIR QUALITY CEC Twan Ngo 4.1-22 (Exhibit 14). The CEC gave the applicant the choice of using the cleaner technology or not. The Air district did not give them the choice to use the cleaner technology. Mr. Lee spoke with me for hours in the month of November never informing me of the permit until I asked the right question on 11/29. My Constructive notice of appeal was on November 1, 2007 It should be noted that Mr. Lee's notes 11/3/07 # 2 also substantiate my concerns about the ineffectiveness of the fireplace retrofit program

The district acknowledges that the CEC did hold extensive hearings and received a number of letters from the public on Air Quality issues. Prior to review of the CEC proceedings the Air district and the public did not have the information available to properly consider the Air Districts actions. It is capricious and an abuse of discretion to make Final determinations of compliance prior to completion of the CEC hearings in this "coordinated permit review process". This has led to incorrect conclusions on the part of the district.

Response to Declaration of Mike Monasmith

I have participated in CEC hearings through our HAPA attorney Jewell Hargleroad. I believe that Mr. Monasmith would be aware of this since he knows who I am through our conversations, personal introductions and seeing me sitting next to our attorney interacting as a client would at the front table in hearings (Eastshore). Mr. Monasmith's Emails (exhibit 15) provide a review of his communications with me and demonstrate evidence of my participation. I have never received responses to my inquiries with Mr. Monasmith. The CEC has not sent copies of all written materials that are filed in the docket. They have only sent materials that are accompanied by a service list. Monasmith contends that they received "several comment letters....addressing

air quality. The last 2 pages of Monasmith's Exhibit A disclose many opposition letters without a docket date. The entire docket was not provided. The docket log, from the original proceedings and service list (exhibit 16) provide extensive evidence of additional public air quality concerns and inadequacy of the service list for satisfaction of 124.10 Please take administrative notice of the entire proceeding. I request subpoena of all items identified in Exhibit A Monasmith Decl. prior to a decision on this matter.

PSD REQUIREMENTS

The district alleged that "that no PSD requirements are cited in the Petition, only District regulations and provisions of state law" Reading the petition can reveal numerous references to PSD requirements including code and section references. Also The Failure to consider CO2 emissions is not just a violation of state law SB 32 and AB 1368 it is a violation of Federal ruling Massachusetts vs. EPA 2007 and is currently in review by the EAB. Deseret Power Electric Cooperative (Bonanza) In the Event that the Sierra Club does not prevail in the above action, California's unique Carbon Dioxide concerns are best expressed by the Attorney General of California in State of California vs. EPA 2007 I ask that administrative notice be taken of these cases. The San Francisco Bay Area is a non-attainment area for Ozone and for PM2.5.

The following excerpt is from the FDOC

The EPA models SCREEN3 and ISCST3 were used in the air quality impacts analysis. A land use analysis showed that the rural dispersion coefficients were required for the analysis. The models were run using five years of meteorological data (1990 through 1994) collected approximately 6.6 km southeast of the project at the BAAQMD's Union City meteorological monitoring station. Because the exhaust stacks are less than Good Engineering Practice (GEP) stack height, ambient impacts due to building downwash were evaluated. Using 1990-1994 San Leandro ozone monitoring data, page 60 amended FDOC

In addition to using air data from 14-18 years ago the test method is also outdated pursuant to the following information from the EPA

promulgation package which establishes _____ as the preferred air dispersion model in the Agency's "Guideline on Air Quality Models" (_____) in place of the ISC3 air dispersion model was signed by the Administrator of the US EPA on October 21. The package was then submitted to the Federal Register office and was published November 9, 2005.

This rule becomes effective December 9, 2005. Beginning one year after this date, the new model - _____ - should be used for appropriate application as replacement for ISC3. During this one-year

period, protocols for modeling analyses based on ISC3 which are submitted in a timely manner may be approved at the discretion of the appropriate Reviewing Authority. Applicants are therefore encouraged to consult with the Reviewing Authority as soon as possible to assure acceptance during this period.

The shoreline fumigation impact was not correctly modeled. The site is neither rural nor inland. Please note the following excerpt:

SCREEN3 Model User's Guide

2.4.7 Fumigation Option

Once the distance-dependent calculations are completed, SCREEN will give the user the option of estimating maximum concentrations and distance to the maximum associated with inversion break-up fumigation, and shoreline fumigation. The option for fumigation calculations is applicable only for rural inland sites with stack heights greater than or equal to 10 meters (within 3,000m onshore from a large body of water.) The fumigation algorithm also ignores any potential effects of elevated terrain.

**The New Source Review provisions of 40CFR51.165
BACT**

The equipment licensed by the district is outdated and no longer manufactured. Calpine may install used equipment from another facility earning Emission Reduction Credits of over \$40,000,000. I provided the following letter for the air district's Board of Directors (Exhibit 17) but the staff did not provide it to them. A simple comparison of the emission potential for the Calpine facility and another similar sized California facility reveals a stark difference. El Segundo application compared to Calpine's demonstrates NO2 emissions reduced from 134.6 tons to 91 tons, CO emissions reduced from 389.3 tons to 194.1 tons, Pm reduced from 86.8 tons to 51.8 tons. The El Segundo facility (exhibit 18) was referenced in the CEC air quality testimony of Twan Ngo 4.1-9

The letter, referenced by the district, from the CEC to the Air district, dated May 29, 2007 (Exhibit 19) and the CEC staffs assessment explain the disparity. The following air district rules and associated federal statutes are violated by approval of this facility.

2-2-101 Description: This Rule shall apply to all new and modified sources which are subject to the requirements of Regulation 2-1-301. The purpose of this Rule is to provide for the review of new and modified sources and provide mechanisms, including the use of Best Available Control Technology (BACT), Best Available Control Technology for Toxics (TBACT), and emission offsets, by which authorities to construct such

sources may be granted. This rule implements the no net increase requirements of Section 40919 (a)(2) of the Health and Safety Code as demonstrated by the requirements of Section 2-2-316. The New Source Review provisions of 40 CFR 51.165 and the Prevention of Significant Deterioration provisions of 40 CFR 51.166 are hereby incorporated by reference.

2-2-218 Federally Enforceable: All limitations and conditions that are enforceable by the Administrator of the U. S. EPA, including requirements developed pursuant to 40CFR Parts 60 (NSPS), 61 (NESHAPS), 63 (HAP), 70 (State Operating Permit Programs) and 72 (Permits Regulation, Acid Rain), requirements contained in the State Implementation Plan (SIP) that are applicable to the District, any District permit requirements established pursuant to 40 CFR 52.21 (PSD) or District regulations approved pursuant to 40 CFR Part 51, Subpart I (NSR), and any operating permits issued under an EPA-approved program that is a part of the SIP and expressly requires adherence to any permit issued under such program

2-2-314 Federal New Source Review Applicability: The requirements of 40 CFR 51.165 are incorporated, by reference, as part of this rule.

ENDANGERED SPECIES AND PROTECTED HABITATS

The letter from The EPA to USFWS and response from USFWS (Exhibit 20) requesting an informal consultation contains errors of fact and incomplete analysis. The letter states "The nearest tidal marshes are approximately 1400 feet to the south and separated from the project by distribution warehouses In its new location, Russell city would avoid impacts to seasonal wetlands and protected species mentioned above" The project in its new location is surrounded an at least 180 degrees with protected habitats and endangered species (Exhibit 12) There is a tidal channel within 50 feet of the project. There are no Warehouses between the project and most of the biological impact areas. It should be noted that a 30 foot high warehouse offers little respite from 145 foot tall smoke stacks. Sensitive habitats are located less than 500 feet due west of the project.

The request for informal consultation agreement discloses that a formal consultation was in process in 2002 and Calpine withdrew its plan in spring of 2003 halting the consultation. Jim Browning from the USFWS confirmed on the telephone with me that he did not consult the original file prior to agreement with the EPA request. His letter also does not say that he reviewed the prior evidence. I request subpoena authority to review the USFWS file regarding this project prior to a decision by the EAB.

The Original Application For Certification AFC biological and land use sections (Exhibit 21) provide a reasonable assessment of the conditions at that time.

Considerations of noise impacts were studied in the original 2002 CEC staff assessment Excerpts are as follows:

“Numerous waterfowl and shorebird species inhabit the proposed project region, and some studies indicate ducks, geese, long distance migrants and colonial nesting birds are particularly susceptible to noise disturbances (Burger 1981; Markham and Brechtel 1979). RECON (1989) concluded that noise levels above 60 dBA affected the territorial behavior of a state and federally listed bird species not known from the RCEC project region. A report on noise criteria for the protection of endangered perching birds concluded that the 60 dBA criterion derived from the RECON (1989) study, while not suitable for all species and situations, did come from the available scientific data and was a reasonable departure point (TNCC 1997). The 60 dBA criterion has been used by the USFWS as a reference point for evaluating noise impacts to wildlife (Buford 2001)....

Staff is concerned that construction impacts, particularly noise, could directly impact sensitive species breeding areas and wildlife using the surrounding areas. The USFWS has also raised this concern. Applicant estimates noise levels from pile-driving and steam blow activities will range from 106 decibels (dBA) @ 50 feet to 65 dBA @ 1.02 miles (Calpine/Bechtel 2001). Sensitive nesting species within a one-mile radius of the proposed project site could be exposed to noise levels above 60 dBA. A general rule for estimating noise levels at increasing distances is to decrease the noise level by 6 dBA as the distance is doubled (Birdsell 2001). Applying this to the pile-driving and steam blow activities provides estimated noise levels of 100 dBA @ 100 feet, 76 dBA @ 1,600 feet (> ¼ mile) and 70 dBA @ 3,200 feet (> ½ mile) respectively.

Staff was particularly concerned with potentially adverse operational noise impacts to the upland area adjacent to the southwest border of the proposed project site. Because this upland area is considered salt-marsh harvest mouse refugia, staff was concerned that noise from proposed project operation would increase background noise levels, making it more difficult for the salt-marsh harvest mouse, and other wildlife, to detect predators.

Noise disturbances from construction activities during the mating and nesting season may have an adverse effect on formation of pair bonds and/or reproductive success of sensitive species in the project area; furthermore, construction related disturbances could discourage habitat use by wildlife. Information obtained from the EBRPD documents the presence of several breeding/nesting species under federal/state protection within a one-mile radius of the project footprint (Taylor 2001). These include: federally and state endangered -salt marsh harvest mouse, federally threatened, state species of concern-Western snowy plover, federally and state endangered-California clapper rail, state species of concern, black skimmer and the state and federally endangered-California least tern. Joe Didonato, Wildlife Program Manager for the East Bay Regional Parks District, indicated the presence of snowy egret (*Egretta thula*) and black-crowned night heron (*Nycticorax nycticorax*) rookeries within one-quarter mile of the proposed project site (Didonato2001). These rookeries are listed as sensitive by CDFG....”

The 2007 CEC staff report noise and vibration section (Exhibit 22) which addresses the noise impact for people but ignores the impact on endangered species and migratory birds. It measures the noise impact on the San Francisco Bay trail on the Cogswell marsh bridge at the opposite end of the protected habitat and demonstrates a noise impact of 44 db which is slightly less than the existing noise level from the sound of the water of 44.5 db. The noise contour map in the above exhibit demonstrates 65db next to the habitat but the map cuts off just before the habitat. Ostensibly the habitat impact will be from 65 to 44 db going towards the bridge (exhibit 12). This is presently an extremely quiet area away from the noise of the waves and restricted from human access for preservation. This noise is a direct negative impact to endangered species.

IMPACTS OF NITROGEN DEPOSITION ON CALIFORNIA ECOSYSTEMS AND BIODIVERSITY (Exhibit 23)

The impacts described in the above referenced report demonstrate a potentially significant impact to the environment including the vernal pools described in the following CEC staff assessment excerpt;

Wetlands and Habitat Compensation

Although Energy Commission staff agrees with the project owner's conclusion that the project site would not cause a direct loss of wetlands (RCEC 2006), thereby eliminating

the requirement for a Wetlands Mitigation Plan originally required in Biological Resources Condition of Certification **BIO-15**, there is a vernal pool on the Eastshore Substation site that must be protected when the new transmission line is brought into the substation. Because the project owner has conducted recent field surveys, identified this sensitive resource, and the transmission line alignment generally avoids the vernal pool (RCEC 2007), Energy Commission staff believes it can be protected by implementation of relatively simple impact avoidance measures that would be described in the project BRMIMP.

The following regulations may also be violated;

Clean Water Act of 1977

Title 33, United States Code, sections 1251-1376, and Code of Federal Regulations, part 30, section 330.5(a)(26).

• **Endangered Species Act of 1973**

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

• **Migratory Bird Treaty Act**

Title 16, United States Code, sections 703-712, prohibit the take of migratory birds.

Coastal Zone Management act

The effects of Global warming and sea level rise associated with projects like this are projected to inundate the entire area by the end of this century.

PUBLIC BENEFIT OR CONVENIENCE?

These requirements were removed from the CEC licensing process when the California energy market was deregulated. This has led to a proliferation of licenses and an overbuilt market. These plants are not a response to market demand or a replacement of older technologies. They will serve to undermine the renewable energy market in the San Francisco area. When Customers make the choice of renewable energy, as many in the Bay area are doing, Pacific Gas and Electric PGE still receives a surcharge based upon its capacity to produce. The requirement for these findings was not removed from the districts responsibility.

ENVIRONMENTAL INJUSTICE

The first sentence of the districts "Background" reads "The Russell City Energy Center is a 600 MW natural-gas fired power plant in the city of Hayward." This is not true. There are no power plants in Hayward at this time. There are plans for 2 power plants. While I believe that the EAB understands this is not an existing facility as stated, the "Notice of Final Action makes the same sort of mis-statement which misleads the public. Many of us do not even know the definition of MW. It is unjust to make abbreviations in a notice without definition. Most people in the affected

area have a limited command of the English Language if they speak it at all. The notice should have also been in Spanish if it were to reach the majority.

Testimony of Sandra Witt DrPH Director of Planning, policy and Health Equity for the Alameda County Public Health Department (Exhibit 24) originally used in the Eastshore Energy Center proceedings. Socioeconomics maps and isopleths graphs for both projects is also included demonstrating their relationship It is important to take administrative notice of the Eastshore Energy Center because they are concurrent plans affecting the same community and referenced on the same letter to the community from the Air District (Exhibit 3)

The Eastshore Energy Center docket 06-afc-6 proceedings also offer extensive evidence of public and government interest when actions are discovered.

NPDES

California Regional Water Quality Control Board letter Dated December 20, 2006 (Exhibit 25) addresses the projects failure to failure to comply with NPDES. Flood plain map and FEMA flood Zone map(s) (Exhibit 25) also demonstrates potential violations of the following:

Executive Order 11988, Floodplain Management

The purpose of this Executive Order, signed May 24, 1977, is to prevent Federal agencies from contributing to the adverse impacts associated with occupancy and modification of floodplains. In the course of fulfilling their respective authorities, Federal agencies shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served

The districts authority to issue a PSD permit.

The re- delegation agreement page 4 # 7 references (Russell City #13161) a project located at 3590 Enterprise avenue (2001 notice) district application 2896 (2001 PDOC)

The permit Dated November 1, 2007. application 15487 is for plant 18136 at Depot Rd and Cabot Blvd. The permit does not contain an address but it is known on the notice dated April 2, 2007 as 3806 Depot Road. Map of both locations (exhibit 25)

Incredible disparity occurs between the 2002 SUMMARY OF AIR QUALITY IMPACTS ANALYSIS and the 2007 version (Exhibit 26) Shoreline fumigation impact increased from 34.6 to 62.4, maximum commissioning impact for carbon monoxide increased from 69.8 to 1977 Class 1 24- hour air quality impacts analysis for the Point Reyes National Seashore increased

from .16 to .21 In a decade of great advances in pollution control this facility was redesigned to increase emissions. This facility only resembles the original in Name and ownership. Pursuant to page 6 number 4 of the re-delegation agreement, the agreement should be revoked.

Notice Inviting Written Public Comment

Notice is hereby given that the Executive Officer/Air Pollution Control Officer (EO/APCO) of the Bay Area Air Quality Management District has issued an amended Preliminary Determination of Compliance (PDOC) and a proposed PSD permit under application number 15487 for a proposed new power plant. The proposed **Russell City Energy Center (RCEC)** would be located at 3806 Depot Road in the City of Hayward, Alameda County, in an area zoned for industrial uses. The project was previously certified by the California Energy Commission on September, 2002. An amendment is required because the site is relocated approximately 1,500 feet to the north from the original location. The proposed facility would be a nominal 600-MW, natural-gas fired, combined-cycle merchant power plant consisting of two natural gas fired combustion turbine generators, one steam turbine generator and associated equipment, two fired heat recovery steam generators, a 9-cell wet cooling tower, and a 300 hp diesel fired pump engine. The PDOC documents the Air Pollution Control Officer's preliminary decision to issue an Authority to Construct for the proposed RCEC.

The proposed power plant would be permitted to emit the following maximum quantities of regulated air pollutants:

| | |
|--|---------------------|
| Nitrogen Oxides | 134.6 tons per year |
| Carbon Monoxide | 389.3 tons per year |
| Particulate Matter (PM ₁₀) | 86.8 tons per year |
| Precursor Organic Compounds | 28.5 tons per year |
| Sulfur Dioxide | 12.2 tons per year |

The emissions of nitrogen oxides (as NO₂), carbon monoxide, particulate matter (PM₁₀), and precursor organic compounds associated with this project will meet the Best Available Control Technology (BACT) requirement of District Regulation 2-2-301.1. The emission increases of nitrogen oxides and precursor organic compounds associated with this project will comply with the emission offset requirements of District Regulation 2-2-302.

Pursuant to District Regulation 2-2-405, the Air Pollution Control Officer invites written public comment on the Preliminary Determination of Compliance and its intended action.

The Preliminary Determination of Compliance is available for public inspection at the Outreach and Incentives Division Office located on the 5th floor of District headquarters at 939 Ellis Street, San Francisco CA, 94109. The PDOC may also be viewed on the District website at www.baaqmd.gov. Written comments should be directed to Weyman Lee of the District Engineering Division by May 12, 2007.

Dated at San Francisco, the 2nd day of April, 2007.

Signed by Brian Bunger for Jack P. Broadbent
Jack P. Broadbent
Executive Officer/APCO
Bay Area Air Quality Management District

Oakland Tribune

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PROOF OF PUBLICATION FILE NO.

In the matter of

RUSSELL CITY ENERGY CENTER

The undersigned deposes that he/she is the Public Notice Advertising Clerk of the OAKLAND TRIBUNE, a newspaper of general circulation as defined by Government Code Section 26000, adjudicated as such by the Superior Court of the State of California, County of Alameda (Order No. 237798, on December 4, 1951), which is published and circulated daily in said county and state, seven days a week.

The PUBLIC NOTICE

was published in every issue of the OAKLAND TRIBUNE on the following date(s):

11/20/01

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.


Public Notice Advertising Clerk

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P.O. 13658

Notice Inviting Written Public Comment

Notice is hereby given that the Air Pollution Control Officer of the Bay Area Air Quality Management District has issued a preliminary Determination of Compliance and a proposed PSD permit for application number 2896 for the Russell City Energy Center, a natural gas fired power plant to be located at 3636 & 3590 Enterprise Avenue in the City of Hayward.

The proposed power plant is projected to emit the following maximum quantities of regulated air pollutants:

| | |
|-----------------------------|---------------------|
| Nitrogen Oxides | 134.6 tons per year |
| Carbon Monoxide | 584.2 tons per year |
| Particulate Matter (PM10) | 86.4 tons per year |
| Precursor Organic Compounds | 28.5 tons per year |
| Sulfur Dioxide | 12.2 tons per year |

The emissions of nitrogen oxides, carbon monoxide, particulate matter (PM10), precursor organic compounds, and sulfur dioxide associated with this project trigger the Best Available Control Technology (BACT) requirement of District Regulation 2-2-301.1. The emissions of nitrogen oxides and precursor organic compounds associated with this project trigger the emission-offset requirements of District Regulation 2-2-302.

Pursuant to District Regulation 2-2-405, the Air Pollution Control Officer invites written public comment on the preliminary Determination of Compliance and its intended action.

The preliminary Determination of Compliance is available for public inspection at BAAQMD, Public Information Office, 5th floor, 939 Ellis Street, San Francisco, CA 94109. The document is also available on the District website at www.baaqmd.gov. Go to Russell City Energy Center in the index. Written comments should be directed to the District Permit Services Division by December 20, 2001.

Dated at San Francisco,
the 14th day of November 2001.

Ellen Garvey
Executive Officer/Air Pollution
Control Officer
Bay Area Air Quality
Management District

The Oakland Tribune, #26071
November 20, 2001

Notice of Final Action

Notice is hereby given that the Air Pollution Control Officer (APCO) of the Bay Area Air Quality Management District has issued an Authority to Construct pursuant to Application Number 15487 for the **Russell City Energy Center**, located at Depot Road and Cabot Blvd, Hayward, California effective November 1, 2007.

The project is a 600 MW combined-cycle power plant consisting of two natural gas fired combustion turbine generators (CTGs), one steam turbine generator (STG) and associated equipment, two supplementally fired heat recovery steam generators (HRSGs), a 9-cell wet cooling tower, and a 300-hp diesel fire pump engine.

The equipment is subject to the Prevention of Significant Deterioration (PSD) analysis requirement.

The final engineering evaluation document for the APCO's decision to issue the Authority to Construct is available for public inspection at the Public Information and Education Office located on the 5th floor of District headquarters at 939 Ellis Street, San Francisco California, 94109.

The proposed project is projected to emit the following maximum quantities of regulated air pollutants:

| | |
|--|---------------------|
| Nitrogen Oxides | 134.6 tons per year |
| Carbon Monoxide | 389.3 tons per year |
| Particulate Matter (PM ₁₀) | 86.8 tons per year |
| Sulfur Dioxide | 12.2 tons per year |
| Precursor Organic Compounds | 28.5 tons per year |

Dated at San Francisco, the 30th day of November, 2007.

Barry G. Young
Manager, Permit Evaluation
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Brian Lusher

From: Alexander Crockett

Sent: Tuesday, May 08, 2007 3:24 PM

To: Brian Lusher

Brian:

I was looking around on the web for press on the Eastshore Energy Center and I found a website maintained by Michael Toth. (In case you haven't seen it, it's at <http://edengardens.wordpress.com/>) He lays out a list of arguments against the facility, which I expect will be reflected in his comments.

One statement he made caught my eye. He states that "According to Tierra, in its application to the CEC, this plant will cause an impact of **50** micrograms per cubic meter 24-hour average concentration of PM2.5, where the National Ambient Air Quality Standard, a Federal regulation, is **35** micrograms per cubic meter, a point about which the CEC has expressed concern." Do you know what he means by this? Is he correct that the PM2.5 emission, *by themselves*, will cause a violation of the PM2.5 NAAQS, before even taking into account all of the other sources of PM2.5 that could contribute to ambient concentrations? Is he correct in this, or is this perhaps a concentration at the emission point which will be diluted before it becomes a true "ambient" concentration? If you have any thoughts on this point, I'd be interested to hear them. We may hear this same argument on June 1.

Sandy

5/8/2007

Brian K. Lusher
District Engineering Division
BAAQMD
939 Ellis Street
San Francisco, CA 94109
Telephone: 1-415-749-4623
Fax: 1-415-749-5030
E-mail: blusher@baaqmd.gov

My (Our) name is JOAQUIN BENAVIDES SR
(Name)
I (We) Live at 1467 FRY LANE
(Address)
HAYWARD, CA 94545
(City, State, Zip)

Dear Mr. Lusher
and Bay Area Air Quality Management District,

I (We) Are writing to you in reference to the
Eastshore Energy Center, Permit # 15195.

I (We) are opposed to the Eastshore Energy Center being located in Hayward and disagree with the Bay Area Air Quality Management District granting a Preliminary Determination of Compliance, (PDOC), to Eastshore. We ask that you DENY any further approval to the Eastshore Energy Center for several reasons.

The Eastshore Energy Center would be located in a non-attainment area, meaning Hayward has already been determined to be an area with high levels of certain air pollutants by federal and state standards and should not be adding further sources of these pollutants.

The BAAQMD should actively consider the health and safety of the many residents of Hayward with as much gravity as the BAAQMD considers the fairness to, and best interest of, the applicant.

Hayward is being turned into a dumping ground for air pollutants under the BAAQMD's watch. Toxic Air Contaminants created by the Eastshore Energy Center would include: 1,3-Butadiene, Acetaldehyde, Acrolein Ammonia, Benzene, Benzo-a-anthracene, Benzo-a-pyrene, Benzo-b-fluoranthene, Benzo-k-fluoranthene, Chrysene, Dibenz-ah-anthracene, Ethylbenzene, Formaldehyde, Indeno-123cdpyrene, Naphthalene, Propylene, Toluene, Xylenes, Diesel Exhaust Particulate
(This list of contaminants was taken from: BAAQMD Preliminary Determination of Compliance/ Table 4: Maximum Facility Toxic Air Contaminant (TAC) Emissions, Application Number 15095, Eastshore Energy Center, April 30, 2007)

Toxic Air Contaminants created by the Russell City Energy Center would include: Acetaldehyde b, Acrolein, Ammonia c, Benzene b, 1,3-Butadiene, Ethylbenzene, Formaldehyde b, Hexane, Naphthalene, PAH sb, Propylene, Propylene Oxide b, Toluene, Xylenes
a-pursuant to BAAQMD Toxic Risk Management Policy
b-carcinogenic compound, c-based upon the worst-case ammonia slip of 5 ppmvd @ 15% O2 from the A-1 and A-2 SCR systems with ammonia injection. (This Lists of Contaminants was taken from BAAQMD, Preliminary Determination of Compliance/ Table 2: Maximum Facility Toxic Air Contaminant (TAC) Emissions, Russell City Energy Center, November 15, 2001)

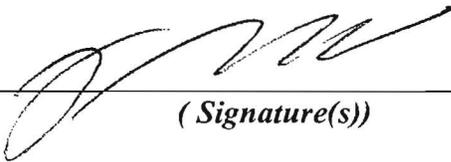
I (We) feel that the amounts of these of pollutants are unacceptable to be released into Hayward's air near to residences and schools.

Therefore on the basis of Environmental Justice, and in the interest of the citizens of Hayward, I (we) DO NOT ACCEPT the Bay Area Air Quality Management District's PDOC and demand that the Bay Area Air Quality Management District DENY the Eastshore Energy Center further approval.

Additionally on the basis of Environmental Justice and fairness, and in the interest of the health and safety of the residents of Hayward, I (we) also request that Hayward be granted adequate, continuous real-time air quality monitoring stations located on the Hayward flatlands without delay. (One suitable location for these stations could possibly be located at the Chabot College Campus.)

In Conclusion, I (we) do not accept the Preliminary Determination of Compliance,(PDOC), and it's air quality data as accurate or valid. I (we) oppose it's finding and demand that the Bay Area Air Quality Management District DENY the Eastshore Energy Center FURTHER APPROVAL.

Sincerely,



(Signature(s))

Additional Comments:

(Please mail before June 1st, 2007)

Grandview Realty

From: Brian Lusher [blusher@baaqmd.gov]
Sent: Thursday, February 07, 2008 10:19 AM
To: Grandview Realty
Subject: RE: Response to Comments, Info on PSD and Title V Major Source Thresholds

Rob,

The FDOC was sent to the CEC, ARB, EPA and adjacent air districts on 10/17/07. Response to comments letters were sent on 10/17/07 to the ARB, CEC and one resident of Hayward. The general response to comment letters were sent out on 10/24/07.

The District received approximately 605 comments regarding the PDOC and the project.

Regards,

Brian K. Lusher
Air Quality Engineer II
Bay Area Air Quality Management District
415 749-4623

-----Original Message-----

From: Grandview Realty [mailto:GrandviewRealty@comcast.net]
Sent: Thursday, February 07, 2008 1:54 AM
To: Brian Lusher
Subject: RE: Response to Comments, Info on PSD and Title V Major Source Thresholds

Brian, can you tell me how many comments you received and if the date on the response October 24, 2007 was the response date to all?

THANKS
ROB

-----Original Message-----

From: Brian Lusher [mailto:blusher@baaqmd.gov]
Sent: Wednesday, January 23, 2008 2:40 PM
To: grandviewrealty@comcast.net
Subject: Response to Comments, Info on PSD and Title V Major Source Thresholds

Rob,

Here is the response to comments signed by Brian Bateman, Director of Engineering.

<<Response to Comments 102307 Commenters No Address.ZIP>>

Eastshore is not a "major source" under the PSD permit program or Title V of the Clean Air Act.

The 40 Ton/yr value for NOx, and the 15 Ton/yr value for PM10 define a major modification to a major source.

Major Source Thesholds for the Title V Permit Program may be found at 40CFR Part 70.2 (page 212).

The Bay Area is designated as "Marginal" for attainment status with the Federal 8-hour Ozone standard.

Areas designated Maginal or Moderate have major source thesholds for Title V set at 100 Tons/year for Criteria pollutants (pollutants with ambient air quality standards).

Regards,

Brian K. Lusher
Air Quality Engineer II
Bay Area Air Quality Management District
415 749-4623

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.516 / Virus Database: 269.19.13/1246 - Release Date: 1/27/2008
6:39 PM

No virus found in this outgoing message.

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Version: 7.5.516 / Virus Database: 269.19.20/1262 - Release Date: 2/6/2008
9:13 AM

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.516 / Virus Database: 269.19.21/1265 - Release Date: 2/7/2008 11:17 AM

October 24, 2007

Subject: **Preliminary Determination of Compliance
Eastshore Energy Center
Application No. 15195**

ALAMEDA COUNTY

Tom Bates
Scott Haggerty
Janet Lockhart
Nate Miley

CONTRA COSTA COUNTY

John Gioia
Mark Ross
(Chair)
Michael Shimansky
Gayle B. Uilkema

MARIN COUNTY

Harold C. Brown, Jr.

NAPA COUNTY

Brad Wagenknecht

SAN FRANCISCO COUNTY

Chris Daly
Jake McGoldrick
Gavin Newsom

SAN MATEO COUNTY

Jerry Hill
(Vice-Chair)
Carol Klatt

SANTA CLARA COUNTY

Erin Garner
Yoriko Kishimoto
Liz Kniss
Patrick Kwok

SOLANO COUNTY

John F. Silva

SONOMA COUNTY

Tim Smith
Pamela Torliatt
(Secretary)

Jack P. Broadbent
EXECUTIVE OFFICER/APCO

Dear Commenter:

The Bay Area Air Quality Management District (District) has received your comments regarding the District's Preliminary Determination of Compliance (PDOC) for the proposed project.

The District has considered your comments, along with other comments that were submitted, and has made a final determination that the proposed project meets the requirements of the District's Risk Management Rule (Reg. 2 Rule 5) and meets all other applicable District Regulations as well as applicable State and Federal regulatory requirements. The District will continue to participate in the California Energy Commission licensing process to ensure that the project will have no significant air quality impact to Hayward or the Region.

The public comments received on the Preliminary Determination of Compliance are addressed below.

Comment Category 1: Proposed Project located in a non-attainment area.

Commenters stated that the Region is not in attainment of the State and Federal Ambient Air Quality Standards and that it would not be appropriate to add new sources of air pollution.

Response to Comment Category 1

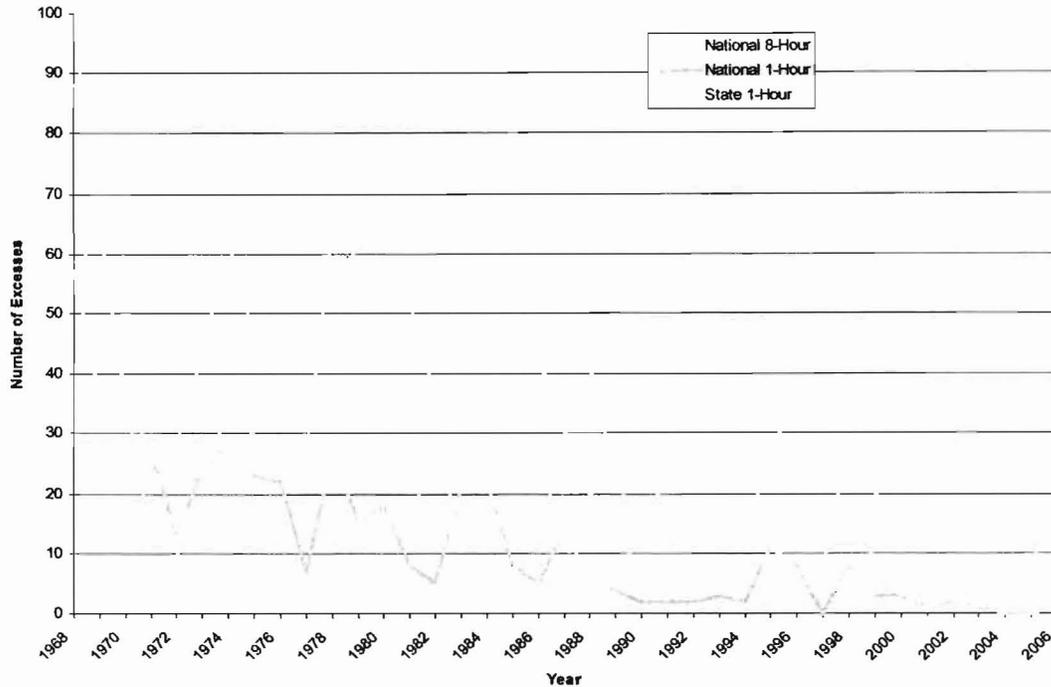
Currently, the Bay Area is designated as "attainment" for CO, NO₂, SO₂, and lead, which means that the air quality in the Bay Area meets federal and state standards for those pollutants. The Bay Area is designated as "non-attainment" for the state and federal ozone standards and for the state standards for fine particulate matter (PM₁₀ and PM_{2.5}). New, more stringent federal standards for fine particulate matter have recently been adopted, but EPA has not yet made a designation for the Bay Area for those standards.

air quality standards apply to the Bay Area as a whole. Thus, the fact that Hayward may be a "non-attainment" area or a "non-attainment" area for a given pollutant does not mean that air quality in Hayward is any better or worse than anywhere else in the Bay Area, and does not mean that the proposed project will have any greater or lesser impacts on air quality if it is located in Hayward as opposed to any other location in the Bay Area.

The fact that the Bay Area is designated as "non-attainment" for certain pollutants does not mean that no new projects can be built. The District does not prohibit all new projects as a result of a "non-attainment" designation. Instead, the District requires new projects – including the proposed Eastshore Energy Center – to incorporate strict air pollution controls to ensure that emissions are minimized, and also requires new sources of emissions to be "offset" by shutting down other sources of emissions so that there is no net increase as a result of the new project. The District's process ensures that regional emissions will continually be reduced in order to bring the region back to "attainment" for all regulated pollutants.

The District's regulatory system has a good track record in this regard. Air quality in the Bay Area has been improving over time as shown in Figures 1, 2 and 3. The region still faces challenges as in meeting the air quality standards for ozone and fine particulate matter, and the District is continuing to develop strategies for the region to achieve compliance with these standards. The latest information is available on our website (www.baaqmd.gov) under the following topics:

O3 Ozone Bay Area Historical Exceedances



Notes:

National 1-hour ozone standard was revoked on June 15, 2005.

On May 17, 2005, the California Air Resources Board implemented a new 8-hour ozone standard of 0.070 ppm, which was exceeded on 22 days in 2006 in the Bay Area.

Comment Category 2: Public Health Impacts due to proposed facility.

Commenters stated concerns over emissions of Toxic Air Contaminants from the proposed project and the Russell City Energy Center. Commenters were also concerned regarding proposed project impacts on asthma and health for nearby members of the community.

Response to Comment Category 2

The District takes very seriously the health concerns raised by the commenters. There are a number of health problems that can be caused or exacerbated by air pollution, and the District is committed to improving air quality and public health in all communities throughout the Bay Area.

As shown in the FDOC the District performed a Health Risk Screening Assessment for the project and the results were in compliance with the District Rule 2, Regulation 5 requirements. The results of the Health Risk Assessment were below the significance criteria for cancer risk, chronic health impacts, and acute non-cancer health impacts. The District review shows that the emissions from the proposed facility will not cause a significant impact on public health in the community. The District also performed a Health Risk Screening Assessment for the Russell City Energy Center that shows that facility will not cause a significant impact on public health in the community.

Asthma and Health

With respect to asthma specifically, California Energy Commission staff examined the potential for asthma impacts in its Preliminary Staff Assessment and found that the proposed project would not cause a significant impact on asthma and public health in the community. The District reviewed this assessment and concurs in its conclusions. The Preliminary Staff Assessment is available at the Energy Commission website, and at the Hayward Public Library.

Comment Category 3: Cumulative Impact of proposed project, Russell City Energy Center and other existing sources of air pollution in the West Hayward area.

Commenters stated concerns regarding the cumulative impact of the proposed project, the Russell City Energy Center, and other existing air pollution sources in the surrounding community.

Response to Comment Category 3

The potential for cumulative impacts on air quality has been addressed through the CEC licensing process that is equivalent to the California Environmental Quality Act ("CEQA") environmental impact review process. Because the proposed project is a power plant that will be licensed by the CEC, the CEC has taken the lead for this project for purposes of conducting the environmental review. The CEC's staff has completed a detailed review of the potential impacts in its Preliminary Staff Assessment, and found that after mitigation measures are implemented there will be no significant cumulative impacts. The District supports the CEC's analysis and incorporates it by reference.

Comment Category 4: Proximity of the proposed project to nearby schools and residents.

Commenters expressed concern regarding the land use of the proposed site and its proximity to nearby schools and residents.

Response to Comment Category 4

Local land-use determinations and decisions about where to site power plants are made by the City of Hayward and the California Energy Commission, not by the District. The District's role is to evaluate the potential air quality impacts of a proposed project and determine whether the project will comply with air quality regulations. The District has done so and has determined that the proposed project will comply, as explained in the Determination of Compliance. In doing so, the District evaluated the potential for impacts on neighboring schools and residents.

Comment Category 5: Use of District Monitoring Network for Ambient Air Quality at Project Site.

Commenters stated a concern that the District does not currently have an ambient air monitoring station in the specific project area and the baseline ambient air quality data from the District air monitoring network may not be representative of air quality in the project area.

Response to Comment Category 5

The District's extensive air monitoring network provides a very good picture of ambient air quality conditions at the proposed project's location. The District currently operates 30 air monitoring stations throughout the 9 Bay Area counties, and meets or exceeds all monitoring requirements established by the California Air Resources Board and the US Environmental Protection Agency. The data produced by the District's air monitoring network and meteorological monitoring network is representative of the conditions in Hayward and the East Bay area.

The District does not place an air monitoring station in every single community throughout the Bay Area because to do so would be very costly and is not necessary to measure ambient air quality accurately. Monitoring stations have expensive capital costs and the equipment requires a specialist to operate and maintain the station. There is no need for additional stations beyond what the District already has in its extensive monitoring network in order obtain a representative picture of ambient air quality for a given area, and the costs of doing so would not be justified.

Comment Category 6: Use of Emission Reduction Credits to comply with District Rules and Regulations and to mitigate project impacts.

Commenters stated a concern that Emission Reduction Credits allow the facility to violate or bypass Air Quality Rules and Regulations, and that the use of Credits was not appropriate, nor an effective form of mitigation.

Response to Comment Category 6

The commenters are incorrect that the use of Emission Reduction Credits allows a facility to violate or bypass Air Quality rules and regulations.

The use of Emission Reduction Credits is the second step in a two-step process to ensure that air pollution is minimized and reduced in the Bay Area. The first step requires that all new projects meet strict regulations to minimize emissions. All new projects that will emit over 10 pounds per highest day of NO_x, POC, CO, PM₁₀, or SO_x must use the Best Available Control Technology ("BACT") to reduce emissions to the maximum feasible extent. Then, once a project has minimized its emissions as much as feasible, the second step requires that any remaining emissions that cannot be minimized must be "offset" by the use of Emission Reduction Credits to ensure that there is no net emissions increase overall as a result of the new project. Thus, the use of Emission Reduction Credits does not circumvent air quality regulations, it is an integral part of the air quality regulations. In fact, this system is required by the California Clean Air Act.

The use of Emission Reduction Credits – also known as "Emissions Banking" – has worked to improve air quality in the Bay Area, in other parts of California, and on a national level. In California, ozone levels have been reduced in many areas in part because of Emissions Banking. On a national and international level, Emissions Banking has helped to reduce acid rain in the Northeast and in Canada.

Emissions Reduction Credits are generated by closing sources down or by reducing emissions from sources beyond what air quality regulations require. The District maintains a "bank" of Emissions Reductions Credits generated by such reductions, from which new projects must obtain Credits to offset their emissions. A facility wanting to bank its emissions reductions must submit a Banking Application to the District. The Application is evaluated by an engineer to determine the quantity of emissions reductions that may become Emission Reduction Credits. The total emissions reductions from the closure of a facility may be significantly higher than the quantity that may become Emissions Reduction Credits.

District regulations require the proposed project to obtain offsets for its NO_x and POC emissions because the facility will emit greater than 35 tons per year of those pollutants. The proposed facility will be required to offset its NO_x and POC emissions at a ratio of 1 to 1.15, meaning that for every ton emitted the facility will have to provide 1.15 tons of Emissions Reduction Credits. NO_x and POC are both ozone precursors, and District regulations allow POC offsets to be used interchangeably for NO_x. The proposed facility will be required to provide the Emissions Reduction Credits before the District issues the Authority to Construct for the project.

Additional information on Emissions Banking and Emission Reduction Credits may be found on the District website (www.baaqmd.gov) under the following topic:

Comment Category 7: Adequacy of Emissions Estimates for Wartsila Engines.

Commenters stated that Wartsila emissions information was used by the District to estimate emissions from the engines, and this was not appropriate since the company would benefit from the sale of these proposed engines. Commenters stated that adequate independent emissions testing had not been conducted for this specific Wartsila engine. Commenters stated that Wartsila emissions information was not compared to independently gathered emissions data. Commenters stated that emissions factors for Toxic Air Contaminants were not representative of the Wartsila engines proposed for use at the Eastshore Energy Center.

Response to Comment Category 7

The District based its estimates of emissions from the proposed project on reliable data from the testing of similar engines to the ones that will be used at the proposed project. The first section below outlines the data the District relied on for emissions of "criteria pollutants", which are pollutants that are not normally significant when emitted by a single facility, but which may become significant when emitted by a large number of sources and combine to impact ambient air quality over a large area. The second section outlines the data the District relied on for Toxic Air Contaminants ("TACs").

Criteria Pollutants

For criteria pollutants, the District relied primarily on independent testing conducted on similar engines at six other facilities, as explained in the FDOC. These tests were conducted by EPA-certified independent testing contractors to demonstrate that each engine could meet its permit limits. The data from these tests provide a good basis from which to estimate emissions from the proposed project.

The District considers all available information about emissions, and did review data supplied by Wartsila, the manufacturer of the engines. This was not the only information the District considered, as noted above. But even so, the District does not simply rely on the emissions estimates it develops for a proposed project, it incorporates them into the permits it issues as enforceable conditions. Here, the proposed project will be required to demonstrate that its emissions are no more than the estimated amounts, and will be subject to enforcement action if it exceeds the limits.

Toxic Air Contaminants

To estimate emissions of TACs from the proposed project, the District used published emission factors from the California Air Resources Board, called CATEF factors. These emissions factors are based on source testing conducted in the early 1990s on two natural gas fired engines similar to the ones that will be used at the proposed project. The CATEF factors provide a conservative estimate of emissions from the proposed project for several reasons. First, emissions from newer engines are typically much lower than for the older models used in determining the CATEF factors. Second, the engines used in determining CATEF factors were not equipped with an oxidation catalyst, which reduces emissions of organic TACs. The engines at the proposed project will be equipped with an oxidation catalyst.

To confirm further that the CATEF factors provide a conservative estimate of emissions from this project, the District compared the CATEF factors with data from tests on existing Wartsila engines for emissions of formaldehyde. Formaldehyde is one of the most important TACs from

the proposed project because it is the second-highest cancer risk driver. Together with 1,3-Butadiene, these TACs account for over 90% of the total calculated cancer risk from the proposed facility. All 14 engines at the Nevada facility that uses Wartsila engines were tested for formaldehyde emissions, and in every case emissions were well below the CATEF factors. As shown below, the highest test result was less than half of the CATEF factor (adjusted for a 40% abatement efficiency) and the average result was an order of magnitude less than the CATEF factor (adjusted for a 40% abatement efficiency). These results further confirm that the CATEF factors provide conservative estimates of emissions from the proposed facility and are appropriate for use in evaluating TAC emissions and associated impacts.

| Source | Emission Factor lb/MMBtu |
|--|--------------------------------|
| CATEF | 0.00462 No Oxidation Catalyst |
| Emission Factor for Health Risk Assessment | $0.00462 \times 0.6 = 0.00277$ |
| Nevada AVG | 0.000277 |
| Nevada MAX | 0.0012 |

Notes: Oxidation Catalyst Reduction Efficiency = 40%

Nevada AVG = Average of all 14 Engines

Nevada MAX = Maximum Engine

Finally, the District will require the applicant to test an engine for all TACs of concern once the project is built, and to use the results to rerun the Health Risk Screening Assessment to demonstrate that the facility complies with the District's Risk Management Rule. This requirement will alleviate any potential concerns about whether the estimates the District used are sufficiently accurate.

In addition, each Wartsila engine will be equipped with a Continuous Emission Monitor for Carbon Monoxide. Carbon Monoxide and Organics are formed in the combustion process due to incomplete combustion. An engine with high carbon monoxide emissions would also have high organic emissions and a portion of the organic emissions are TAC. The Environmental Protection Agency is currently promulgating a regulation to reduce Hazardous Air Pollutants from large internal combustion engines. The EPA background information supporting this draft rule states that the agency has determined that Non Methane Hydrocarbons, carbon monoxide, and formaldehyde are good surrogates for all Hazardous Air Pollutant emissions from internal combustion engines. The continuous monitoring for carbon monoxide allows the District to determine if an engine is emitting high quantities of incomplete combustion products and whether the oxidation catalyst is working correctly.

Comment Category 8: Global Warming Impacts.

Commenters were concerned that the plant would emit green house gases that contribute to global warming.

Response to Comment Category 8

The proposed facility will burn fossil fuel and therefore will emit greenhouse gases that contribute to global climate change. The facility will burn natural gas, however, which is the cleanest burning and least carbon-intensive fossil fuel. In addition, a significant number of California's electric generating stations are over 30 years old, and a new facility is much more efficient than these older units. New facilities require less fuel per Megawatt of energy produced. The California Air Resources Board is developing an implementation strategy for Assembly Bill 32, which the governor signed into law last year. District staff will be working with the Air Resources Board in reducing emissions of green house gases in the Bay Area to meet the requirements of Assembly Bill 32. Additional information regarding greenhouse gas emissions from the proposed facility may be found in the California Energy Commissions Preliminary Staff Assessment.

Comment Category 9: Potential Environmental Justice Impacts.

Commenters raised issues relating to environmental justice due to the proposed project and the Russell City Energy Center.

Response to Comment Category 9

The District is committed to implementing its permitting programs in a manner that is fair and equitable to all Bay Area residents regardless of age, culture, ethnicity, gender, race, socioeconomic status, or geographic location in order to protect against the health effects of air pollution. The District has worked to fulfill this commitment in making its Determination of Compliance for the proposed project.

The District and the CEC have undertaken a detailed review of the potential public health impacts of the emissions associated with the proposed facility, and have found that after mitigation measures are implemented the project emissions will not have a significant impact on public health or air quality in the community. Since there will be no significant air-quality related impact, by definition there cannot be a significant impact on an environmental justice community.¹

If you have any additional questions, please contact Mr. Brian Lusher at or (415) 749-4623.

Thank you for your comments.

Very truly yours,



Brian F. Bateman
Director of Engineering
Engineering Division

BFB:BKL

¹ The commenters did not provide any specific information about any racial, ethnic, or economic characteristics about the area in which the proposed project would be located, which would be needed to determine whether the area is an environmental justice community. Because the District has determined that the proposed project would not have any significant adverse impacts, it necessarily follows that there can be no significant environmental justice impacts no matter what the exact characteristics of the area are. The District has therefore concluded that the proposed project does not implicate environmental justice concerns without adopting a position on whether the project is located in an environmental justice community.

Welcome to the *California*
Energy Commission



WWW.ENERGY.CA.GOV / SITINGCASES / RUSSELLCITY AMENDMENT / DOCUMENTS

Russell City Amendment Proceeding
Documents Page - Docket # 01-AFC-7C

| [Commission Documents](#)

| [Owner's Documents](#)

| [Other Interested Government Agencies' Documents](#)

| [Intervenors' Documents](#) |

Most files are Adobe Acrobat Portable Document Format (PDF) files. To download, navigate and print these files you will need the **free** Acrobat Reader software available from [Adobe Systems Incorporated's Web Site](#).

Some PDF files are very large. Download these directly to your computer's hard drive by "right-clicking" the link to the file (use option-mouse click if on a Macintosh). After the file is downloaded, open it through Acrobat Reader.

Figures and Maps

None at this time.

[Staff's Response to Petitions to Intervene](#) - Posted November 1, 2007. (PDF file, 38 pages, 1.2)

[Commission's Final Decision](#) - Posted October 3, 2007. (PDF file, 224 pgs, 1.6 mb)

[Transcript of the September 5, 2007 Committee Conference](#) - Posted September 18, 2007. (PDF file, 173 pgs, 660 kb)

[Order approving extension of deadline for commencement of construction](#) - Posted September 11, 2007. (PDF file, 1 pg, 60 kb)

[Errata and Revisions to the Presiding Member's Proposed Decision](#) - Posted September 10, 2007. (PDF file, 11 pgs, 63.3 kb)

[Staff Comments on the Presiding member's Preposed Decision](#) - Posted Posted September 10, 2007. (PDF file, 2 pgs, 48 kb)

[Presiding Member's Proposed Decision](#) - Posted: August 24, 2007. (PDF file, 229 pgs, 3.1 MB).

[Order Approving Transfer of Ownership to Russell City Energy company, LLC](#) - Posted August 7, 2007. (PDF file, 1 pg, 53.15 kb)

[Transcript of the July 19, 2007 Prehearing Conference](#) - Posted August 2, 2007. (PDF file, 23 pgs, 100 kb)

[Transcript of the July 19, 2007 Evidentiary Hearing](#) - Posted August 2, 2007. (PDF file, 289 pgs, 1.09 mb)

[Declaration of Paul Richins](#) - Posted July 27, 2007. (PDF file, 1 pg, 11.41 kb)

[Agreement Regarding WASTE-8, WASTE-9, and WASTE-10](#) - Posted July 27, 2007. (PDF file, 4 pgs, 25.82 kb)

[Staff's Pre-Hearing Conference Statement](#) - Posted July 24, 2007. (PDF file, 3 pgs, 31.12 kb)

[Staff Errata to Staff Assessment](#) - Part 1 and Part 2. Posted July 19, 2007. (PDF file, 42 pgs, 340 kb)

Staff Requests for Agency Comments on Potential Impacts on Hayward Airport Operations - Posted: July 5, 2007. (PDF file, 14 pgs, 64 kb).

Staff Assessment - Parts 1 and 2 Combined - Posted: July 2, 2007. (PDF file, 494 pgs, 2.9 MB).

Transcript of the June 6, 2007 Joint Committee Status Conference. Posted: June 19, 2007. (PDF file, 213 pgs, 832 kb).

Comments from the Committee Status Conference. Posted: June 4, 2007. (PDF file, 2 pgs, 23.8 kb).

Letter to Jack Broadbent re: Amended Preliminary Determination of Compliance. Posted: May 31, 2007. (PDF file, 3 pgs, 40 kb).

Amendment No 1 Data Requests (#82-96). Posted: May 30, 2007. (PDF file, 3 pgs, 25 kb).

Staff's Third Round of Data Requests (#73-81). Posted: May 30, 2007. (PDF file, 5 pgs, 30 kb).

Feasibility of common site for both Eastshore and Russell City power plants. Posted: May 16, 2007. (PDF file, 1 pg, 26.8 kb)

Status Report #2. Posted: May 11, 2007. (PDF file, 2 pgs, 16 kb)

Staff's Second Round of Data Requests (#55-72) - Posted: April 5, 2007. (PDF file, 13 pgs, 60 KB).

Staff's Data Requests #53 and #54 - Posted: April 5, 2007. (PDF file, 1 pg, 12 kb).

Staff Assessment - Part 1 - Posted: April 3, 2007. (PDF file, 192 pgs, 2.9 MB).

Land Use Issues, Letter to Planning Manager David Rizk - Posted: March 21, 2007. (PDF file, 5 pgs, 51 kb).

Status Report #1. Posted: December 28, 2006. (PDF file, 60 pgs, 228 kb)

Transcript for the 12/15 Informational Hearing and Site Visit. Posted: December 28, 2006. (PDF file, 60 pgs, 228 kb)

Amendment Data Requests (#1-52). Posted: December 22, 2006. (PDF file, 30 pgs, 200 kb)

Issues Identification Report. Posted: December 15, 2006. (PDF file, 11 pgs, 190 kb)

Owner's Documents

Request to Deny Petitions to Reconsider Opportunity to Intervene. - Posted November 1, 2007. (PDF file, 33 pgs, 144 kb)

Opposition to the Petitions to Intervene of the County of Alameda, the Chabot-Las Positas Community College District and the Group Petitioners. - Posted November 1, 2007. (PDF file, 98 pages, 2 mb)

Letter from Calpine to Energy Commission (dated 9/14/07) - Urging Commission to take final action on Presiding Member's Proposed Decision at the Sept. 26th Business Meeting. Posted September 18, 2007. (PDF file, 5 pgs, 257 kb)

Email Regarding Project Owners Comments on the Presiding Member's Proposed Decision Condition of Certification TRANS-10 - Posted September 13, 2007. (PDF file, 1 pg, 17 kb)

Comments on the Presiding Member's Proposed Decision - Posted September 11, 2007. (PDF file, 15 pgs, 380 kb)

Project Owner's Comments on Condition of Certification TRANS-10 - Posted September 11, 2007. (PDF file, 6 pgs, 36 kb)

Petition for Extension of Deadline for commencement of Construction - Posted July 26,2007. (PDF file, 6 pgs, 83.95 kb)

Final Testimony Regarding Exhibits 2 through 16 and 30. - Posted July 24, 2007. (PDF file, 66 pgs, 2 mb).

FinalTestimony Regarding Plumes and Aviation - Posted July 19, 2007. (PDF file, 67 pgs, 3.4 mb).

Owners Prehearing Conference Statement - Posted July 19, 2007. (PDF file, 11 pgs, 124 kb).

Owner's Comments on Staff's Assessment Parts 1 and 2 Combined - Posted: July 12, 2007. (PDF file, 8 pgs, 102.11 kb).

Final Plume Vertical Velocity Assesment of a Proposed Gas-Fired Power Station - Posted: July 11, 2007. (PDF file, 55 pgs, 1.19 mb).

Addendum - Plume Vertical Velocity Assesment of a Proposed Gas-Fired Power Station - Posted: July 11, 2007. (PDF file, 10 pgs, 155 kb).

Revised Plume Vertical Velocity Modeling. Posted: June 21, 2007. (PDF file, 56 pgs, 1.4 mb).

Plume Vertical Velocity Modeling. Posted: June 13, 2007. (PDF file, 57 pgs, 980 kb).

Owner's Status Report #2 in Response to Energy Commission Staff's Status Report #2. Posted: May 18, 2007. (PDF file, 12 pgs, 41.8 kb).

Owner's Comments on Preliminary Staff Assessment, Part 1. Posted: May 3, 2007. (PDF file, 6 pgs, 104 kb).

LFRR's Response to Department of Toxic Substances Control Letter, April 2007. Posted: April 25, 2007. (PDF file, 11 pgs, 111 kb).

Response to Data Requests 73-96, and Workshop Queries 1-3, April 2007. Posted: April 24, 2007. (PDF file, 44 pgs, 1 megabyte).

Response to Data Requests 16, and 55-72, March 2007. Posted: April 24, 2007. (PDF file, 85 pgs, 2 megabytes).

Owner's Response to Staff Data Requests 1-52, Cover Letter - Posted: April 5, 2007. (PDF file, 5 pgs, 45 kb).

Data Responses 1-52 - Posted: April 18, 2007. (PDF file, 686 pgs, 55 megabytes)
This is a very large file. For best results, right-click the link, "save target as" and download to your computer, then open in Acrobat.

Owner's Responses to Data Requests #53 and #54 - Posted: April 5, 2007. (PDF file, 6 pgs, 52 kb).

Owner's Status Report #1 - Posted: April 5, 2007. (PDF file, 14 pgs, 88 kb).

Amendment #1. Posted: November 17, 2006. (PDF file, 258 pgs, 9 mb)

Appendixes. (PDF files)

The original Application for Certification documents. PDF files.

Other Interested Government Agencies' Documents

Petition by County of Alameda for Re-Opening of Administrative Proceedings, Re-Opening of Evidentiary Record, Reconsideration of Commission Decision, and Request for Stay - Posted: October 24, 2007. (PDF file, 14 pgs, 252 kb).

Letter from Federal Avlation Administration regarding Russell City Energy Center Impact on Hayward Executive

Airport - Posted: September 25, 2007. (PDF file, 4 pg, 258 kb).

Alameda County Airport Land Use Commission Resolution for the Russell City Energy Center - Posted: September 25, 2007. (PDF file, 4 pg, 94 kb).

Letter from James E. Sorensen, Director, Alameda County Community Development Agency, dated September 24, 2007 regarding continuance on the Russell City Energy Center - Posted: September 24, 2007. (PDF file, 2 pg, 1.05 mb).

Letter from Alice Lai-Bitker, Alameda County Supervisor dated September 20, 2007 regarding continuance on the Russell City Energy Center - Posted: September 20, 2007. (PDF file, 1 pg, 124 kb).

Letter and two e-mails from Federal Aviation Administration dated September 18 and 19, 2007, RE: FAA Written Response regarding Hayward Powerplant Issue - Posted: September 19, 2007. (PDF file, 4 pgs, 414 kb).

Comments from the City of Hayward regarding the Russell City Commission Hearing - Posted: September 13, 2007. (PDF file, 1 pg, 20 kb).

Letter from the Aircraft Owners and Pilots Association regarding location of the Exhaust Stacks - Posted: August 3, 2007. (PDF file, 37 pgs, 406 kb).

Letter from Federal Aviation Administration Regarding the Exhaust Stacks - Posted: August 3, 2007. (PDF file, 3 pgs, 35.7 kb).

Letter from Cindy Horvath Regarding Alameda County Airport Land Use Commission Hearing - Posted: August 3, 2007. (PDF file, 2 pgs, 32 kb).

Letter from the Department of Transportation Regarding the Airport Airspace Requirements - Posted: July 18, 2007. (PDF file, 1 pg, 10.57 kb).

Letter from the City of Hayward Regarding the Airport Approach Zoning Regulations - Posted: July 11, 2007. (PDF file, 71 pgs, 1.93 mb).

Bay Area Air Quality Management District's Final Determination of Compliance - Posted: July 10, 2007. (PDF file, 71 pgs, 5.5 mb).

United States Environmental Protection Agency's Request for Informal Consultation under Section 7 of the Endangered Species Act. Posted June 27, 2007. (PDF file, 16 pgs, 1.6 mb).

City of Hayward's Response to Eastshore Energy Center and Russell City Energy Center Projects on One Site (PDF file, 2 pgs, 25.6 kb).

Email from BCDC in regards to Jurisdiction (PDF file, 1 pg, 18.3 kb).

City of Hayward Conditions for the Russell City Energy Center (PDF file, 1 pg, 36 kb).

San Francisco Bay Regional Water Quality Control Board Comments, on LFR's March 27, 2007 Response to DTSC's Comments - Posted: May 10, 2007. *NOTE: Comments by SFBRWQCB (dated 4/30/07) appear in red on pages 2,4,7,9.* (PDF file, 11 pgs, 192 kb).

Department of Toxic Substances Control Comments by J. Naito on LFR's Feedback - Posted: May 9, 2007. (PDF file, 3 pgs, 22 kb).

Prepared by City of Hayward - Mt. Eden Annexation Project - Posted: May 10, 2007. (PDF file, 101 pgs, 1.21 mb).

Bay Area Air Quality Management District's Preliminary Determination of Compliance - Posted: May 3, 2007. (PDF file, 42 pgs, 173 kb).

[Comments from Department of Toxic Substances Control](#) - Posted: April 25, 2007. (PDF file, 7 pgs, 379 kb).

Intervenors' Documents

(Also see Other Government Agencies' Filings Above)

[Group Petition Petition to Intervene and to Reopen Proceedings](#). Posted: November 01, 2007. (PDF file, 64 pages, 1.1 mb).

[Chabot-Las Positas Community college](#), is filing a Petition to Intervene and Petition for Reconsideration. - Posted: November 01, 2007. (PDF file, 5 pages, 52 kb).

[Paul N. Haavik Objection and Response to Petitions to Intervene and Reconsideration](#) - Posted: November 01, 2007. (PDF file, 8 pgs, 52 kb).

[Intervenor's Comments to Paul Kramer on comments on the Proposed Decision](#) - Posted: September 10, 2007. (PDF file, 3 pgs, 27.2 kb).

[Paul Haavik Prehearing Testimony](#) - Posted: July 19, 2007. (PDF file, 76 pgs, 32 kb).

[Intervenors Prehearing Conference Statement](#) - Posted: July 19, 2007. (PDF file, 92 pgs, 952 kb).

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Page Updated: 11/16/2007 15:22:12

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STATE OF CALIFORNIA
State Energy Resources
Conservation And Development Commission

In the Matter of:

RUSSELL CITY ENERGY CENTER,

Docket No.: 01-AFC-7C

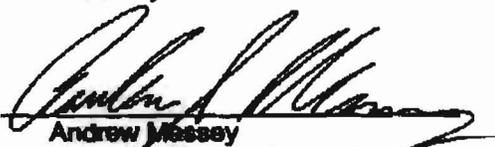
PETITION FOR:

- (1) RE-OPENING OF THE ADMINISTRATIVE PROCEEDINGS;
- (2) RE-OPENING OF THE EVIDENTIARY RECORD;
- (3) RECONSIDERATION OF ENERGY COMMISSION DECISION; AND
- (4) REQUEST FOR STAY

DATED: October 23, 2007

RICHARD E. WINNIE, County Counsel in
and for the County of Alameda, State of
California

BRIAN E. WASHINGTON,
Assistant County Counsel

By 
Andrew Massey
Associate County Counsel

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7 STATE OF CALIFORNIA
State Energy Resources
8 Conservation And Development Commission

9 Docket No.: 01-AFC-7C

10 In the Matter of:

PETITION FOR:

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14 RUSSELL CITY ENERGY CENTER,

- (1) RE-OPENING OF THE
ADMINISTRATIVE PROCEEDINGS;
(2) RE-OPENING OF THE
EVIDENTIARY RECORD;
(3) RECONSIDERATION OF ENERGY
COMMISSION DECISION; AND
(4) REQUEST FOR STAY

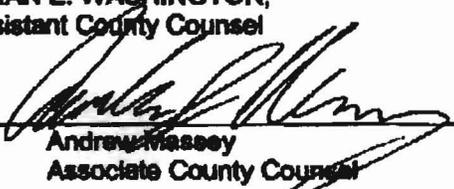
15
16 Intervenor County of Alameda hereby petitions the Commission for a stay and
17 reconsideration of the Commission's Order of September 26, 2007, in the above-referenced
18 matter, and re-opening of the administrative proceedings and evidentiary record.

19 This petition is made on the grounds articulated in the attached Memorandum of Points
20 and Authorities, and based on the pleadings and records on file in this proceeding and the
21 attached Memorandum of Points and Authorities and the Declaration of James Sorensen.

22 DATED: October 23, 2007

RICHARD E. WINNIE, County Counsel in
and for the County of Alameda, State of
California

BRIAN E. WASHINGTON,
Assistant County Counsel

25
26 By 
Andrew Massey
Associate County Counsel

27
28 Check box if continuation pages are attached.
(Proof of Service Must be attached)

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7
8 STATE OF CALIFORNIA
9 State Energy Resources
10 Conservation And Development Commission

11 Docket No.: 01-AFC-7C

12 In the Matter of:

MEMORANDUM OF POINTS AND
AUTHORITIES IN SUPPORT OF
PETITION FOR:

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17 RUSSELL CITY ENERGY CENTER,

- (1) RE-OPEN THE ADMINISTRATIVE PROCEEDINGS;
- (2) RE-OPEN THE EVIDENTIARY RECORD;
- (3) FOR RECONSIDERATION OF ENERGY COMMISSION DECISION;
- AND
- (4) REQUEST FOR STAY

18
19
20 MEMORANDUM OF POINTS AND AUTHORITIES

21 Pursuant to section 1720 of the California Code of Regulations, the County of Alameda
22 ("the County") petitions for a stay and reconsideration of the California Energy Commission's
23 ("the Commission") "Final Decision" of September 26, 2007, approving the proposed
24 amendment to the Russell City Energy Center ("RCEC") site plan. Through the instant petition
25 the County also seeks to re-open the administrative proceedings and re-open the evidentiary
26 record in this matter. The instant petition for reconsideration is supported by the attached
27 Declaration of James Sorensen and filed along with the County's Petition to Intervene and
28 accompanying Memorandum of Points and Authorities.

1 I. **Standard for Petition for Reconsideration**

2 Section 1720(a) provides that "[w]ithin 30 days after a decision or order is final . . . any
3 party may petition for, reconsideration thereof." Grounds for such a petition may be based on
4 either (1) new evidence, or (2) "an error in fact or change or error of law." Id. Furthermore,
5 "[t]he petition must fully explain why the matters set forth could not have been considered during
6 the evidentiary hearings, and their effects upon a substantive element of the decision." Id.

7 A. **The County Will Have Standing**

8 Section 1720(a) only permits the Commission or "any party" to file for reconsideration.
9 At present, the County is not a party to the proceedings. To obtain standing, the County has
10 filed a petition to intervene that accompanies the instant petition for reconsideration. Upon grant
11 of the petition to Intervene, the County will have standing to petition for reconsideration.

12 B. **The County's Petition is Timely**

13 The Commission issued its final decision approving an amendment to the RCEC site
14 plan on September 26, 2007. Final Commission Decision, CEC-800-2007-003-CMF(October
15 2007) ("Final Decision"). Pursuant to 20 CCR § 1720.4, the effective date of a decision is the
16 "the day when the decision or order is docketed, unless the order states otherwise." The Final
17 Order in this case provides that it is effective September 26, 2007. (See Commission Adoption
18 Order at 2.)

19 Therefore, the County has until October 26, 2007 to file a petition for reconsideration.
20 Accordingly, the instant petition is timely filed.

21 II. **Grounds for Reconsideration**

22 The County contends that the Commission provided inadequate and misleading notice
23 to County agencies from which the Commission was obligated to obtain comments, analyses
24 and recommendations for use in making findings in support of its Final Decision. By failing to
25 obtain the County's comments, analyses and recommendations, the Commission made
26 fundamentally flawed findings that did not consider issues that could only have been raised by
27 the County and its agencies.

28

1 Similarly, the Commission appears to have failed to provide residents of unincorporated
2 areas of the County with adequate notice of the RCEC amendment proceedings. Public
3 comment and participation are equally necessary to the Commission's ability to make legally
4 sufficient findings.

5 The failure to provide the County and its residents with notice and the resulting flaws in
6 the findings supporting the Commission's Final Decision rise to a level of significance that
7 qualifies as an "error of law" requiring the Commission to re-open the administrative
8 proceedings and evidentiary record to consider additional comments, analyses and
9 recommendations from the County, and to inform and take comments from the public.

10 In addition, the Commission committed legal error by admitting into evidence without
11 providing an opportunity for rebuttal a series of letters from the Federal Aviation Administration
12 opining on the safety of aircraft departing the Hayward Executive Airport flying through thermal
13 plumes generated by the RCEC. The Commission admitted this evidence that was submitted
14 the day before the final hearing on the Presiding Member's Proposed Decision that had been
15 continued solely to allow admission of this evidence, and subsequently relied upon the opinions
16 expressed therein to support the Final Decision without providing parties, government agencies
17 and the public with their right to rebut those opinions.

18 **A. The Commission's Notice to the County Was Inadequate**

19 Section 1714(c) of the Commission's regulations obligates it to provide notice to local
20 agencies that would have had jurisdiction "but for the commission's exclusive authority to certify
21 sites." 20 CCR § 1714(c).

22 **I. The Amended Site Plan Placed the RCEC Facility within the County's**
23 **Jurisdiction**

24 As the Commission's Final Decision acknowledges, at the time RCEC, LLC¹ filed its
25 amendment application in November, 2006, the proposed new site was within the
26

27 ¹ At the time the RCEC amendment application was filed, Calpine Corporation was the corporate
28 owner/operator of the site. The Commission approved transfer of ownership to RCEC, LLC in an August
1, 2007 order.

1 unincorporated area of Alameda County, and thus squarely within the County's jurisdiction.
2 Final Commission Decision, at 10 n.9. Although in March, 2007, the City of Hayward annexed
3 that portion of the land in the amended site plan located in the unincorporated area of Alameda
4 County, the site nevertheless remains adjacent to unincorporated areas of the County and
5 within the authority of the County Redevelopment Agency pursuant to the Mt. Eden Sub Area of
6 the County Redevelopment Agency's Eden Redevelopment Plan.

7 The Commission sent its "Request for Agency Participation in the Review of the Russell
8 City Energy Center, Application for Certification" (Docket Log No. 20718) ("Request for Agency
9 Participation") to the following County agencies: Department of Agriculture/Weights and
10 Measures, the Department of Environmental Health, the Hazardous Materials Team, Assessor,
11 Auditor, Public Works Agency, and Sheriff. (See List No. 7078, attached as Exhibit B to the
12 Declaration of James Sorensen.) The Mosquito Abatement District also received notice.

13 While the County appreciates notice to the above agencies, adequate notice would at a
14 minimum have included notification to the County Board of Supervisors, Redevelopment
15 Agency, Community Development Agency, the Airport Land Use Commission and the Planning
16 Department. (See Declaration of James Sorensen at ¶8.) These agencies have primary
17 responsibility over land use, transportation, community development and redevelopment in the
18 County. Therefore, the Commission was obligated to provide notice to these agencies as they
19 would have had primary jurisdiction but for the Commission's exclusive authority to certify sites.
20 By failing to provide these agencies with notice, the Commission failed to meet its regulatory
21 obligation under § 1714(c).

22 **ii. The Commission Has Provided Relevant County Agencies Notice in the**
23 **Past**

24 The Commission has in the past provided notice to the relevant County agencies cited
25 above on energy facility application proceedings in Alameda County, including the East
26 Altamont Energy Center (Docket No. 01-AFC-4) and the Tesla Power Plant (Docket No. 01-
27 AFC-21). (See Declaration of James Sorensen at ¶3-4.) Indeed, the Proof of Service List for
28 the Tesla Power Plant proceedings lists the County Planning Department as an interested

1 agency. Furthermore, the Commission did provide notice on the RCEC amendment
2 proceedings to the City of Hayward's Community and Economic Development Department,
3 whose functions broadly corresponds to the County Community Development Agency. (See
4 List No. 7078, attached as Exhibit B to the Declaration of James Sorensen.) Thus the
5 Commission had no excuse for excluding these agencies from its list of interested agencies for
6 the RCEC amendment proceedings.

7 **iii. The Commission Knew or Should Have Known of Improper Notice to**
8 **the County**

9 The Commission's actions in this amendment proceeding indicate that it knew or should
10 have known that it was improperly excluding Alameda County agencies with land use authority
11 and jurisdiction from the proceedings. At a December 15, 2006 Informational Hearing and Site
12 Visit, Hearing Officer Kramer informed the public that the distribution list for the amendment
13 proceedings was "basically from a mailing list that was left over from the previous case."
14 (Transcript, at 12:14-15.) The Commission should have known from its review of the
15 amendment filings that reusing the mailing list from the original RCEC siting proceedings was
16 improper because RCEC, LLC proposed to move the facility on to land in the unincorporated
17 area of the County. If § 1714(c) is to have any force and effect, then the Commission must
18 exercise some diligence in ensuring that the proper interested government agencies are
19 contacted, and not simply rely a five year-old mailing list that does not reflect present
20 circumstances.

21 **iv. The Commission's Notice to the County Was Misleading**

22 What notice was provided to County agencies was misleading, and would not have
23 prompted them to respond to the Commission's request for comment. The "Request for Agency
24 Participation," attached as Exhibit B to the Declaration of James Sorensen, sent by the
25 Commission to County agencies on its distribution list indicates on the first page that "[t]he
26 facility will be located in the City of Hayward" By contrast, page two of the attached "Notice
27 of Public Informational Hearing and Site Visit," also attached as Exhibit B to the Declaration of
28

1 James Sorensen, acknowledges that the new facility will be located "partially in the
2 unincorporated area of Alameda County."

3 Staff of County agencies that did receive notice reviewing the first portion of the
4 document that was directed specifically at government agencies would have been under the
5 false impression that County land use agencies were without jurisdiction over the new site
6 facility because it was located entirely within the City of Hayward. (See Declaration of James
7 Sorensen at ¶17.) Thus it would not have occurred to County staff to conduct the level of
8 review required of the proposed amended RCEC site plan. (See id.)

9 **v. The Commission Must Act to Correct Problems Arising from Its Own**
10 **Improper Notices**

11 While the County does not allege that the Commission intentionally mislead the County,
12 the County does contend that the Commission must bear responsibility for the resulting
13 omission of relevant County agencies from the amendment proceedings. The Commission
14 cannot expect County agencies to pour through every notice it receives to double-check for
15 inconsistencies. The County must rely on the text of these notices, and when the Commission
16 makes an error in that text, it must in good faith attempt to correct that error when it results in
17 the exclusion of government agencies from siting proceedings.

18 When the County contacted the Commission to notify it of its failure to notify relevant
19 County agencies, the Commission ignored the County's concerns. (See Letter from Supervisor
20 Alice Lai-Blitker, September 20, 2007 (Docket Log No. 42380); see also Letter from James
21 Sorensen, Director, CDA, September 24, 2007, attached as Exhibit A to the Declaration of
22 James Sorensen.) The Commission refused the County's reasonable request for a short
23 continuance to allow County agencies and the Board of Supervisors to review the RCEC
24 amendment proposal to determine if the County had any significant concerns. (See id.)

25 **B. The Commission's Findings are Fundamentally Flawed Because It Did Not**
26 **Follow Its Own Regulatory Process to Receive Comment from the County**

27 Section 1714(c) not only obligates the Commission to provide notice to local agencies
28 with jurisdiction, but in addition to "request analyses, comments, and recommendations

1 thereon." This provision undoubtedly serves the purpose of allowing the Commission to obtain
2 the information necessary to make required findings under the Warren-Alquist Act (Cal. Pub.
3 Resources Code § 25500 et seq.) and its own regulations that the proposed site plan conforms
4 with applicable local standards, ordinances or laws, or that the public benefit of the project
5 outweighs any noncompliance. See Cal. Pub. Resources Code §§ 25523(d)(1), 25525; see
6 also 20 CCR § 1769(a)(3)(B).

7 In its Final Decision on the RCEC, the Commission made findings that the amended site
8 plan conformed with all applicable laws, ordinances, regulations and standards ("LORS"). (See
9 Final Decision, at 42, 63, 72, 80, 112, 115, 125, 129, 136, 144, 154, 161, 168, 171-72, 176, 188,
10 197.) These findings are fundamentally flawed because the Commission did not follow its own
11 regulatory procedures requiring it to seek analyses, comments and recommendations from the
12 County and its agencies to determine if the amended RCEC site plan was indeed in compliance
13 with the County's LORS. See e.g. 20 CCR §§ 1714.3, 1714.5 (outlining the procedures by
14 which local agencies are to submit comments, analyses and recommendations, and the method
15 by which the Commission is to consider them). By making such findings without first consulting
16 the County, the Commission has transformed its findings into a form of guesswork in this
17 respect, and may have burdened the County by approving a site facility that is out of compliance
18 with County LORS.

19 In addition, § 1714(c) also facilitates the Commission's ability to make required findings
20 pursuant to § 1769(a)(3)(A), which incorporates findings required pursuant to § 1755 regarding
21 whether the owner/operator will be able to "mitigate or avoid the significant environmental
22 effects . . ." resulting from the proposed facility. § 1755(c)(1). The County is particularly
23 concerned about possible air quality concerns for residents of unincorporated areas of the
24 County who may be affected by pollution from the RCEC.

25 Had the County been properly noticed, it would have provided essential comments and
26 analyses on these and other environmental effects and mitigation issues necessary to the
27 Commission's findings required under § 1769(a)(3)(A). Absent the County's participation in this
28 regard, the Commission's findings are flawed because they are not the product of the

1 Commission's own regulatory process. Moreover, by failing to follow its own regulatory process
2 in arriving at these findings, the Commission has committed legal error that requires it to revisit
3 these issues by re-opening the administrative proceedings and evidentiary record to consider
4 additional material from the County.

5 **C. By Failing to Notice the County, the Commission Did Not Consider the**
6 **Concerns of the County and its Residents**

7 Beyond legal compliance, however, the § 1714(c) requirement that the Commission
8 solicit analyses, comments and recommendations from local governments ensures that the
9 Commission takes into account the concerns of local government agencies and the people they
10 represent when it evaluates proposed site plans. The County and its agencies have recently
11 become aware of community concern over the RCEC site plan's potential environmental, health
12 and safety risks. The Commission's procedural errors have prevented the County from having
13 enough notice and time to sufficiently examine these concerns.

14 Some of these concerns include:

- 15 o The impact of air pollution from the RCEC on nearby residents of unincorporated
- 16 Alameda County;
- 17 o The ability of County transportation infrastructure to accommodate an
- 18 evacuation should there be a hazardous discharge;
- 19 o The potential financial impact on regional redevelopment plans;

20 (See Exhibit A to the Declaration of James Sorensen.)

21 Likewise, the policy of local government involvement underlying § 1714(c) forecloses
22 any contention by the Commission that omitting the County from the RCEC amendment
23 proceedings amounted to a "no harm, no foul." The Commission cannot possibly anticipate what
24 commentary and analysis the County and its agencies would have offered to the proceedings.
25 While the County may ultimately agree with some of the Commission's findings with regard to
26 the above-listed issues, County agencies have not had an adequate amount of time to consider
27 these issues in full. The County and the residents it represents deserve no less than a full

28

1 appraisal of these issues and the confidence that the Commission's approval of a new energy
2 facility was made after a thorough evaluation of all possible evidence and analysis.

3 **D. The Commission's Notice to the Public Was Inadequate**

4 In addition to failing to provide legally sufficient notice to the County, the Commission did
5 not adequately inform members of the public of the RCEC amendment proceedings, and in
6 particular residents of unincorporated areas of Alameda County immediately adjacent or
7 downwind of the facility site. The Commission's failure to provide these residents with notice
8 amounts to legal error as its notice efforts to the public fell far short of its obligation to ensure
9 public participation.

10 The County contends that residents of communities in unincorporated areas of the
11 County that will be affected by the RCEC deserved direct notice of the RCEC proceedings.² In
12 addition, the Commission's distribution list does not indicate that notice was provided to any
13 organizations or local advisory councils in the areas of Castro Valley, San Lorenzo, Ashland,
14 Cherryland, Fairview and Hillcrest Knolls. (See List No. 7078, attached as Exhibit B to the
15 Declaration of James Sorensen.) Without being provided with any notice, organizations and
16 local advisory councils in this area were unable in turn to notify residents of the amendment
17 proceedings.

18 In addition to inadequately notifying residents of the RCEC amendment proceedings, the
19 Commission conducted an insufficient number of public hearings to allow members of the public
20 to voice their concerns with the project. Moreover, all of the Commission's hearings were
21 conducted in Hayward despite that the RCEC is designed to serve as a regional energy facility,
22 and will have environmental impact beyond the City of Hayward.

23
24
25
26 ² The County is uncertain to what degree notice was sent directly to residences because the County's
27 request for distribution lists was returned with partial redactions by the Commission. (See Exhibit B to the
28 Declaration of James Sorensen.) The County's allegation is based upon numerous complaints from
residents in these areas of the County expressing their frustration that they did not receive notice. (See
e.g. Letter from Supervisor Alice Lai-Bitker, September 20, 2007, Docket Log No. 42380.)

1 **E. The Commission Improperly Prohibited Parties, Government Agencies and the**
2 **Public from Analyzing and Rebutting Letters from the Federal Aviation**
3 **Administration**

4 The Commission committed legal error by admitting into evidence a series of letters from
5 the Federal Aviation Administration opining on the safety of aircraft departing the Hayward
6 Executive Airport flying through thermal plumes generated by the RCEC without allowing the
7 parties, interested government agencies or the public the time or opportunity to rebut the
8 opinions contained within the letters.

9 The Commission's Rules of Evidence for siting proceedings are not extensive; however,
10 they do provide that "each party shall have the right to call and examine witnesses, to introduce
11 exhibits, to cross-examine opposing witnesses on any matters relevant to the issues in the
12 proceeding, and to rebut evidence against such party." 20 CCR § 1212(c).

13 At the conclusion of the Commission Hearing on the Presiding Member's Proposed
14 Decision in Sacramento on September 12, 2007, the Commission agreed to continue the
15 hearing to the Commission's next regular Business Meeting in Sacramento on September 26,
16 2007, to allow the Federal Aviation Administration to submit additional evidence. (See
17 California Energy Commission Energy Calendar for September 26, 2007, available at
18 http://www.energy.ca.gov/cgi-pl/cal_make.pl?p1=DAY20070926.) On September 19, 2007, the
19 Federal Aviation Administration submitted two emails attaching a letter from the Regional
20 Director of the Western-Pacific Region³. (See Notice of Availability of the Presiding Member's
21 Proposed Decision, Docket Log No. 42637.) The attached letter included the opinion of the
22 Federal Aviation Administration's Flight Standards Division opining that "the RCEC poses a risk
23 to aircraft in the Hayward traffic pattern . . ." (See Flight Standards Letter at 2.)
24
25
26

27 ³ The emails and letter are available on the Commission's website at http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/others/2007-09-18_FAA_LETTER_EMAIL.PDF
28 (hereinafter "Flight Standards Letter").

1 On September 25, 2007, the Regional Director of the Western-Pacific Region sent a
2 second letter⁴ that significantly modified that opinion to suggest that the risk to aircraft could be
3 mitigated, and that the Federal Aviation Administration hoped to work with the Commission on
4 mitigation efforts. On September 26, 2007, the Commission approved the Presiding Member's
5 Proposed Decision as the Commission's Final Decision. (See Notice of Decision by California
6 Energy Commission, Docket Log No. 42562.) The Commission's Final Decision relied upon the
7 Federal Aviation Administration's opinion in the second letter of September 25, 2007 in
8 approving the RCEC. (See Final Decision, at 3.)

9 These two letters were admitted at the last minute and after the final local evidentiary
10 hearing in Hayward such that parties, interested government agencies, and the general public
11 did not have an adequate opportunity to analyze or rebut the opinions provided therein. The
12 Commission's actions were unfair and unnecessary, as the slight delay proposed by Alameda
13 County would have allowed all parties, interested government agencies and the public to
14 consider and comment upon the Federal Aviation Administration's opinions. Instead, the
15 Commission needlessly rushed to judgment without thorough review and consideration of
16 opposing views. In particular, the Commission should have sought out the County's Airport
17 Land Use Commission's comments on the Federal Aviation Administration's opinions.

18 The Commission's legal error in admitting these two letters without allowing sufficient
19 time and opportunity for analysis and rebuttal merits reconsideration and the re-opening of the
20 administrative proceedings and evidentiary record.

21 **III. The Commission Must Stay Its Final Decision to Allow the County and Its**
22 **Residents Additional Time to Prepare for a Re-Opened Administrative Proceeding**
23 Implicit in the County's arguments is the need for the Commission to stay its Final
24 Decision to provide additional time for County agencies and the public that did not receive
25 notice to prepare comments, analyses and recommendations for a re-opened administrative
26

27 ⁴ This second letter is available on the Commission's website at [http://www.energy.ca.gov/allincases/
28 russelcity_amendment/documents/others/2007-0925_RUSSELL_CITY_ENERGY_CENTER_IMPACT_
HAYWARD_EXECUTIVE_AIRPORT.PDF](http://www.energy.ca.gov/allincases/russelcity_amendment/documents/others/2007-0925_RUSSELL_CITY_ENERGY_CENTER_IMPACT_HAYWARD_EXECUTIVE_AIRPORT.PDF)

1 proceeding and evidentiary record. As articulated in the attached Declaration of James
2 Sorensen, the County will suffer irreparable harm if the Commission declines to stay its Final
3 Decision pending reconsideration.

4 The Commission has already improperly denied County agencies their fair opportunity to
5 thoroughly analyze the RCEC amendment proposal and submit comments, responses and
6 recommendations. Advanced notice to governmental agencies serves the additional purpose
7 of allowing them to conduct studies and prepare thoughtful analyses of complex energy facility
8 proposals.

9 Failing to stay the Final Decision pending reconsideration and the re-opening of
10 administrative proceedings and the evidentiary record would once again deny County agencies
11 the necessary time to prepare the comments, analyses and recommendations. The County
12 requests that the length of time of the stay should at a minimum equal the amount of time
13 afforded to other public agencies that received adequate notice in this proceeding.

14 DATED: October 23, 2007

RICHARD E. WINNIE, County Counsel in
and for the County of Alameda, State of
California

BRIAN E. WASHINGTON,
Assistant County Counsel

17
18
19 By 
Andrew Massey
Associate County Counsel

Attorneys for County of Alameda

28

Author: Weyman Lee at CC_FS
Date: 10/11/01 2:11 PM
Priority: Normal
TO: gbehmer@energy.state.ca.us at Internet
Subject: RCEC
Gabe-

I want to update you on the status of the RCEC PDOC. District Regulation 2-2-307 requires certification that all major facilities owned and operated by the applicant are in compliance with all applicable emission limits and standards. A Certification of Compliance from the applicant was included in the application. However, we recently received source test results from Calpine power plants, Los Medanos and Sutter, that show non-compliance with POC limits. We are waiting for the applicant to resolve this issue, and to submit an updated Certificate of Compliance before issuing the PDOC. I will update you on the progress.

Weyman

Gabe:

The draft PDOC for RCEC is being review by Steve Hill (Manager of the Permit Review Section). I was not able to ascertain the projected date the PDOC will be issued. However, I will contact you when I have more info.

Weyman

Compliance and Enforcement Division

INCIDENT REPORT

**Calpine Los Medanos Energy Center (Site # B1866)
Pittsburg, CA
May 24, 2007**

On May 24, 2007 at approximately 8:00 am, 3 operators at Calpine Los Medanos Energy Center (LMEC) were exposed to chlorine gas when approximately 300 gallons of phosphoric acid was mistakenly loaded into a 7,500 gallon tank containing 350 gallons of 12.5% sodium hypochloride solution located in the facility's water treatment building. LMEC is a 350 megawatt power plant located in Pittsburg, California that produces electricity for the public utility grid. LMEC plant operators immediately contacted the Contra Costa Fire Department (CCFD) and Contra Costa Health Services (Hazmat). The 3 operators who were exposed to the chlorine gas were taken to Delta Diablo Hospital for treatment.

At 9:30 am, CCFD declared the chlorine gas release incident a Level 3 (offsite impacts expected) shelter-in-place. As a precaution, CCFD asked the Pittsburg Police Department to close 3rd Street and Harbor Road, denying entry to a 400 yard section along 3rd Street. Local businesses were informed of the incident and advised by CCFD personnel to evacuate the area.

Upon entry into the LMEC building, the Hazmat team measured chlorine gas concentrations of greater than 50 parts per million (ppm). The contents of the tank containing the sodium hypochloride and phosphoric acid mixture was safely emptied which stopped the chlorine gas emissions. The doors of the building where the tank was located were opened at 1:15 pm to ventilate the remaining chlorine vapors out of the building. The chlorine levels were measured between 0.3 to 0.5 ppm exiting the building when the doors were opened. Additional samples were taken at the property line of the facility without any positive readings.

The District did not receive any odor complaints from the community during this incident.

LMEC representatives do not know at this time how much chlorine gas was released into the air due to this incident. The CCFD downgraded the incident from a Level 3 to a Level 0 (contained and controlled by plant personnel) at 11:23 am on May 24 and eventually re-opened 3rd Street to the public at 1:15 pm. The three LMEC employees that were sent to Delta Diablo Hospital for treatment have been released. District Inspection staff will continue to investigate this incident to determine if any District regulations were violated.

UPDATE:

The final investigation report indicates the chlorine gas release was due to approximately 300 gallons of phosphoric acid mistakenly unloaded into a bleach tank containing 300 gallons of sodium hypochlorite. Events and conditions that contributed to the incident included the facility personnel assuming the bulk delivery was bleach, miscommunication between the bulk delivery driver and the Control Room Operator, driver did not receive site safety indoctrination, and unloading checklist was not correctly followed since product was never verified before off loading.

To prevent the recurrence of this type of incident, LMEC is revising their chemical off loading procedures and training to include:

- Emphasis on contractor orientation for Bulk Chemical Delivery Drivers
- Employee re-training on chemical unloading with emphasis on product verification and job briefing of driver.
- Relocate product cap keys to control room for issuance by Control Room Operator upon first verification of delivery manifest and field operator to provide second verification upon acceptance of key.
- Audit delivery checklists to verify all steps are followed.

The Contra Costa Health Services (CCHS) did not receive any off-site complaints during the incident. In addition, the CCHS Hazardous Materials Response Team conducted air sampling at various locations of the plant perimeter without any positive readings.

The District has not taken any enforcement action since no violation was documented.

November 1, 2007



**BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT
SINCE 1955**

**Russell City Energy Center
Calpine Corporation
4160 Dublin Blvd.
Dublin, CA 94568**

Attention: Barbara McBride, Director, Safety, Health and Environment

**Application Number: 15487
Plant Number: 18136
Equipment Location:
Depot Rd and Cabot Blvd
Hayward, CA**

**ALAMEDA COUNTY
Tom Bates
Scott Haggerty
Janet Lockhart
Nate Miley**

**CONTRA COSTA COUNTY
John Gioia
Mark Ross
(Chair)
Michael Shimansky
Gayle B. Ullkama**

**MARIN COUNTY
Harold C. Brown, Jr.**

**NAPA COUNTY
Brad Wagenknecht**

**SAN FRANCISCO COUNTY
Chris Daly
Jake McGoldrick
Gavin Newsom**

**SAN MATEO COUNTY
Jerry Hill
(Vice-Chair)
Carol Klatt**

**SANTA CLARA COUNTY
Erin Garner
Yoriko Kishimoto
Liz Knies
Patrick Kwok**

**SOLANO COUNTY
John F. Silva**

**SONOMA COUNTY
Tim Smith
Pamela Toriatt
(Secretary)**

**Jack P. Broadbent
EXECUTIVE OFFICER/APCO**

Dear Applicant:

This is the Authority to Construct and PSD permit for the following sources:

- S-1 Combustion Turbine Generator (CTG) #1, Westinghouse 501F, 2,038.6 MMBtu/hr maximum rated capacity, natural gas fired only; abated by A-1 Selective Catalytic Reduction System (SCR) and A-2 Oxidation Catalyst**
- S-2 Heat Recovery Steam Generator (HRSG) #1, with Duct Burner Supplemental Firing System, 200 MMBtu/hr maximum rated capacity; Abated by A-1 Selective Catalytic Reduction (SCR) System and A-2 Oxidation Catalyst**
- S-3 Combustion Turbine Generator (CTG) #2, Westinghouse 501F, 2,038.6 MMBtu/hr maximum rated capacity, natural gas fired only; abated by A-3 Selective Catalytic Reduction System (SCR) and A-4 Oxidation Catalyst**
- S-4 Heat Recovery Steam Generator (HRSG) #2, with Duct Burner Supplemental Firing System, 200 MMBtu/hr maximum rated capacity; Abated by A-3 Selective Catalytic Reduction (SCR) System and A-4 Oxidation Catalyst**
- S-5 Cooling Tower, 9-Cell, 141,352 gallons per minute**
- S-6 Fire Pump Diesel Engine, Clarke JW6H-UF40, 300 hp, 2.02 MMBtu/hr rated heat input.**

The equipment described above is subject to condition number 23763.

For Federal PSD purposes and in accordance with 40 C.F.R. §§ 124.15 and 124.19, (1) the effective date of the permit shall be 30 days after the date of the final decision to issue, modify, or revoke and reissue the permit; and (2) if an appeal is made to the Environmental Appeals Board ("EAB") through the Administrator, the effective date of the permit shall be suspended until such time as the appeal is resolved. 40 C.F.R. § 124.19 contains procedures for appealing PSD permitting decisions.

Notification

Please contact your assigned Permit Engineer, listed in the correspondence section of this letter, by phone, by fax, or in writing at least three days before the initial operation of the equipment so that we may observe the

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Application: 15487
Russell City Energy Center

equipment in operation and verify conformance with the Authority to Construct. Operation includes any start-up of the source for testing or other purposes. Operation of equipment without notification to the District may result in enforcement action. Do not send start-up notifications to the Air Pollution Control Officer.

Start-up Period

After receipt of the start-up letter required above, this Authority to Construct authorizes operation during the start-up period from the date of initial operation noted in your start-up letter until the Permit to Operate is issued, up to a maximum of 90 days. All conditions (specific or implied) of the Authority to Construct are in effect during the start-up period.

Fees

District Regulation 3 requires a fee for each new Permit to Operate. You will be invoiced upon receipt of your start-up letter. No permits will be issued until all outstanding fees are paid.

Implied Conditions

In the absence of specific permit conditions to the contrary, the throughputs, fuel and material consumption, capacities, and hours of operation described in your permit application will be considered maximum allowable limits. A new permit will be required before any increase in these parameters, or change in raw material handled, may be made.

Expiration

In accordance with Regulation 2-1-407, this Authority to Construct expires two years from the date of issuance unless substantial use of the authority has begun.

Confidentiality

Unless you have already designated specifically identified materials in your permit application as confidential, under the California Public Records Act, all data in your permit application, the permit itself and all permit conditions will be considered a matter of public record and may be disclosed to a third party. Please contact your permit reviewer immediately if you wish to amend your permit application submittals or to designate certain permit conditions as confidential. Unless we hear from you within ten (10) calendar days of this letter, except for materials that have been previously designated as confidential, you shall be deemed to have waived any claim of confidentiality with respect to all materials in the District's files relating to this permit application.

Right of Entry

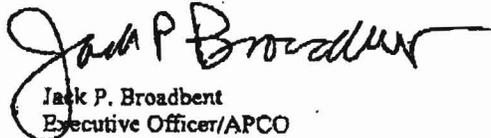
The Air Pollution Control Officer of the Bay Area Air Quality Management District, the Chairman of the California Air Resources Board, the Regional Administrator of the Environmental Protection Agency, and/or their designees, upon presentation of credentials, shall be granted the right of entry to any premises on which an air pollution source is located for the purposes of:

- A. The inspection of the source
- B. The sampling of materials used at the source
- C. The conduct of an emissions source test
- D. The inspection of any records required by District rule or permit condition.

Correspondence

Please include you application number with any correspondence with the District. The District's regulations may be viewed online at www.baaqmd.gov. If you have any questions on this matter, please call Weyman Lee, Senior Air Quality Engineer at (415) 749-4796. Startup information may be faxed to the Engineering Division at 415-749-5030.

Very truly yours,


Jack P. Broadbent
Executive Officer/APCO

Stan Register ©

CALPINE AND BECHTEL JOINT DEVELOPMENT

Vendor No. 0000000291 Check Date 05/24/2001 Check No. 001095

| Invoice Number | Invoice Date | Voucher ID | Gross Amount | Discount | Paid Amount |
|---|--------------|------------|--------------|----------|------------------------------|
| CKRQ052401 | 05/24/2001 | 00001722 | 249,300.00 | 0.00 | 249,300.00 |
| Vendor Name BAY AREA AIR QUALITY MGT DIST | | | | | Total Paid Amount 249,300.00 |

A/N 002896

VERIFY THE AUTHENTICITY OF THIS MULTI-TONE SECURITY DOCUMENT. CHECK BACKGROUND AREA CHANGES COLOR GRADUALLY FROM TOP TO BOTTOM.



CALPINE AND BECHTEL JOINT DEVELOPMENT
6700 Koll Center Parkway, Suite 200
Pleasanton, CA 94566
(925) 600-2000

UNION BANK OF CALIFORNIA, N.A.
California, Oregon, Washington

CHECK NUMBER
001095

PAY TO THE ORDER OF **249,300.00**

DATE 05/24/2001 AMOUNT *****\$249,300.00

TWO HUNDRED FORTY-NINE THOUSAND THREE HUNDRED DOLLARS AND 00 CENTS

TO THE ORDER OF
BAY AREA AIR QUALITY MGT DIST
939 ELLIS STREET
SAN FRANCISCO, CA 94109

COPY
Andrew Syll
Authorized Signature
Ana B Curtis

⑈0000001095⑈ ⑆1230000068⑆ 1870016367⑈



CALPINE AND BECHTEL JOINT DEVELOPMENT
6700 Koll Center Parkway, Suite 200
Pleasanton, CA 94566

LOG # 68694
APPLIED \$249,300⁰⁰

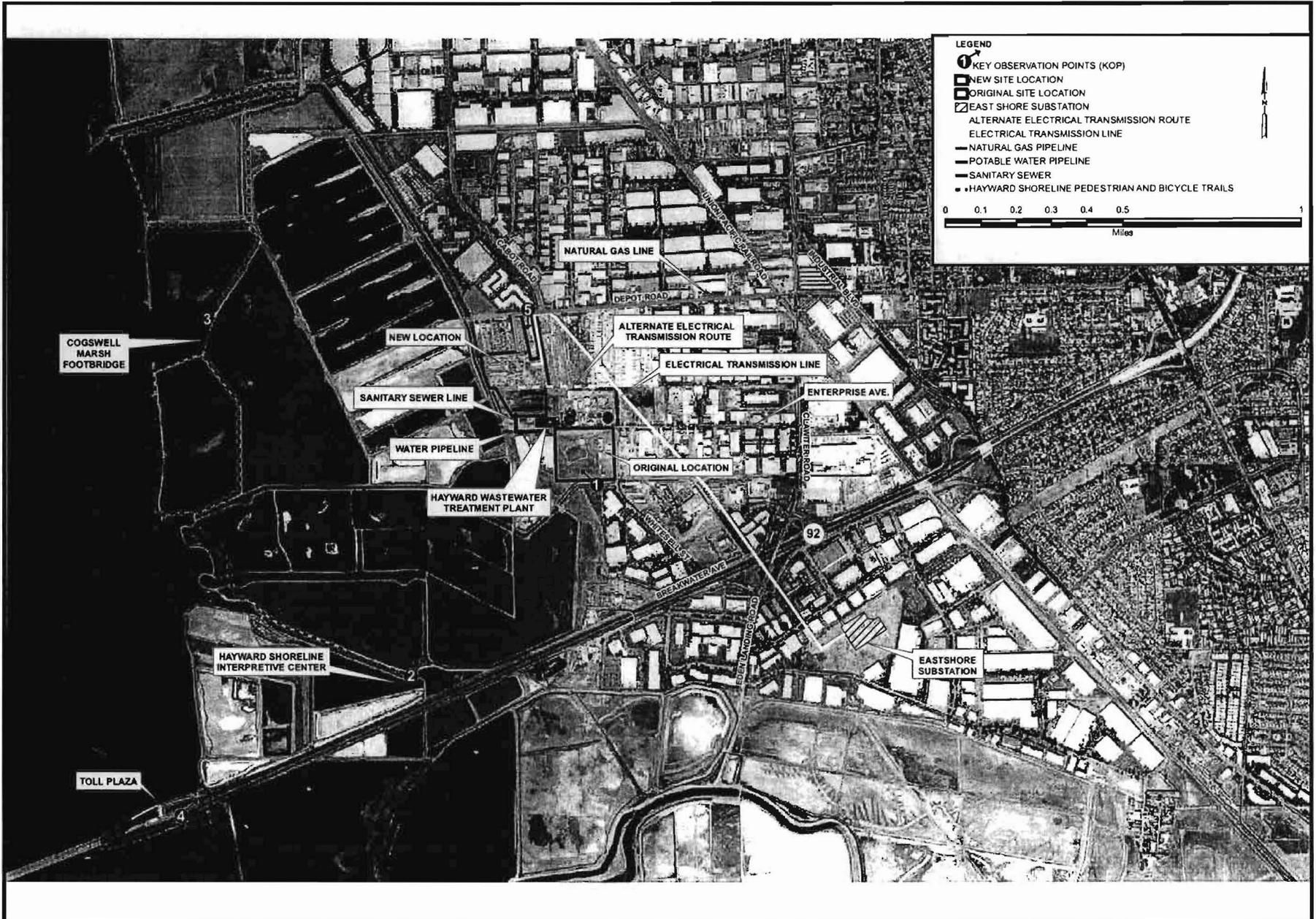
BAY AREA AIR QUALITY MGT DIST
939 ELLIS STREET
SAN FRANCISCO, CA 94109

#1316 Russell City

VISUAL RESOURCES - FIGURE 2
 Russell City Energy Center Project - Location of Key Observation Points

JUNE 2007

VISUAL RESOURCES



VISUAL RESOURCES - FIGURE 2
 Russell City Energy Center Project - Location of Key Observation Points

JUNE 2007

VISUAL RESOURCES

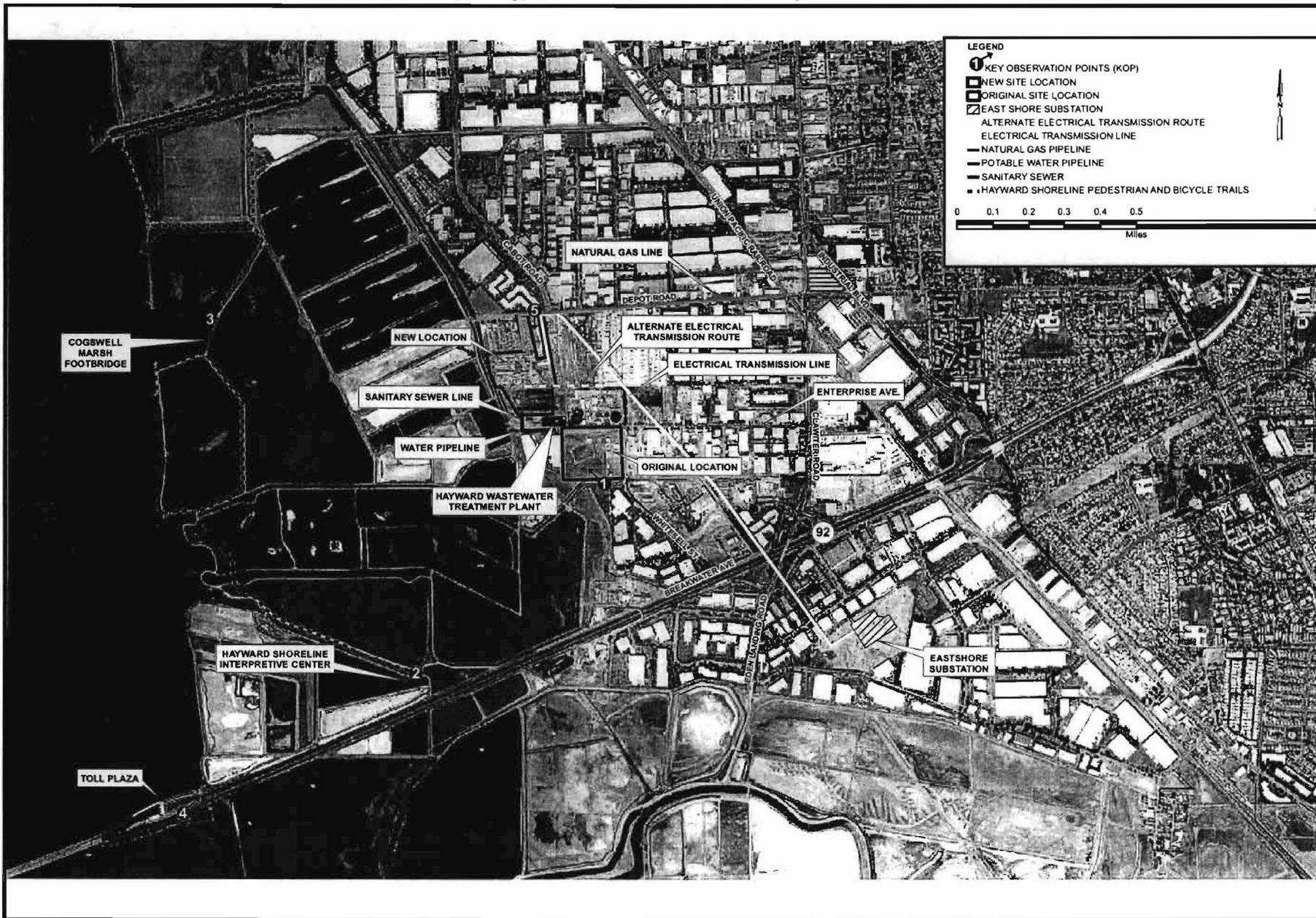




FIGURE 3.12-1
LOCATION OF PROJECT FEATURES
AND KEY OBSERVATION POINTS
 RCEC AMENDMENT #1
 HAYWARD, CALIFORNIA



LEGEND

- KEY OBSERVATION POINTS (KOP)
- NEW SITE LOCATION
- ORIGINAL SITE LOCATION
- ▨ EAST SHORE SUBSTATION
- ALTERNATE ELECTRICAL TRANSMISSION ROUTE
- ELECTRICAL TRANSMISSION LINE
- NATURAL GAS PIPELINE
- POTABLE WATER PIPELINE
- SANITARY SEWER
- HAYWARD SHORELINE PEDESTRIAN AND BICYCLE TRAILS

0 0.1 0.2 0.3 0.4 0.5 1

Miles
1:15,000
SCALE IS APPROXIMATE

FIGURE 3.12-1
LOCATION OF PROJECT FEATURES
AND KEY OBSERVATION POINTS
 RCEC AMENDMENT #1
 HAYWARD, CALIFORNIA

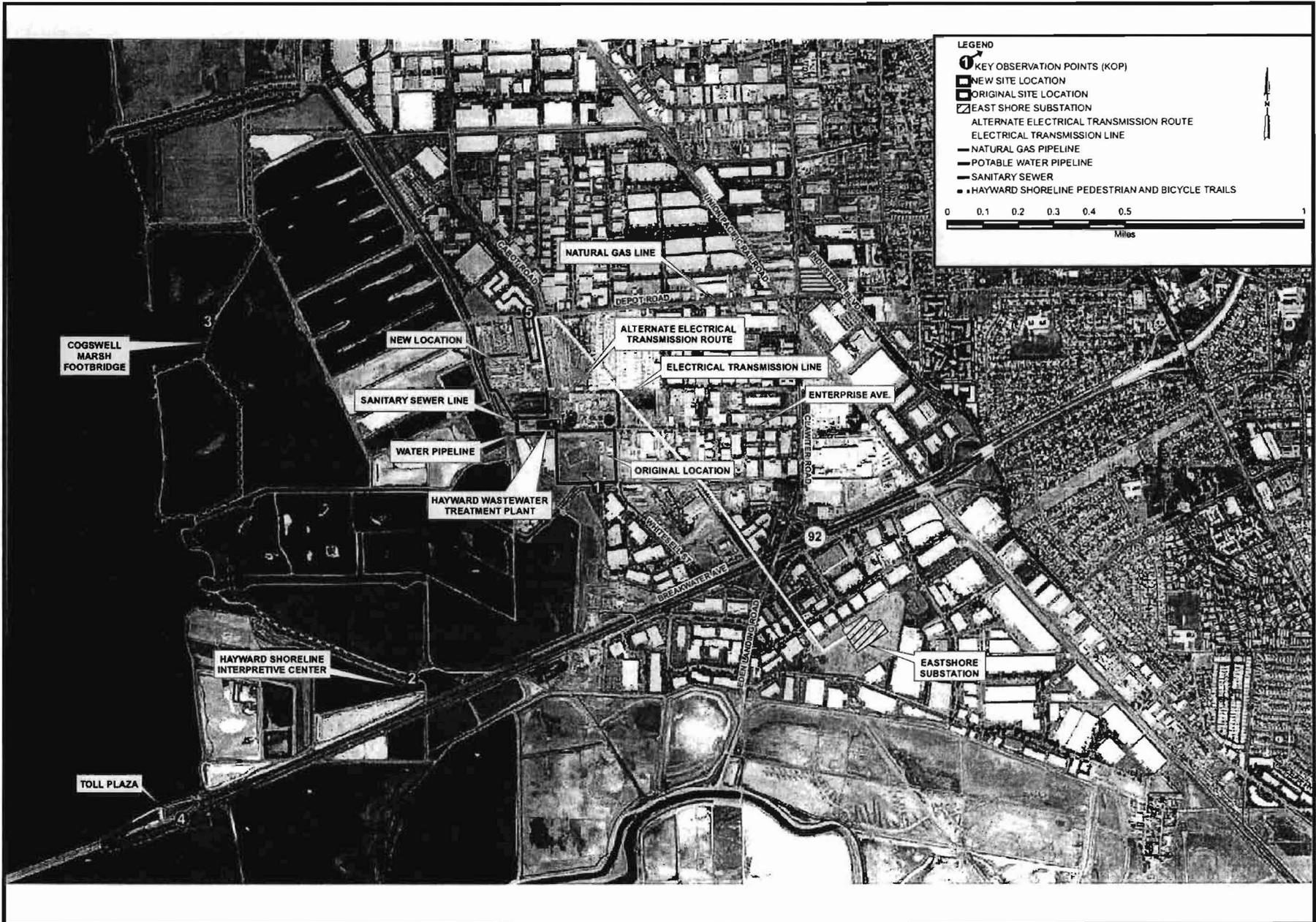
ENC 104LACIER\PROJ\349406_RUSSELLCITYMAPFILES\KOPS.MXD 11/13/2006 08:51:36



FIGURE 3.12-1
LOCATION OF PROJECT FEATURES
AND KEY OBSERVATION POINTS
 RCEC AMENDMENT #1
 HAYWARD, CALIFORNIA

VISUAL RESOURCES - FIGURE 2
 Russell City Energy Center Project - Location of Key Observation Points

JUNE 2007



VISUAL RESOURCES

The applicant, in conjunction with Energy Commission and BAAQMD staff, identified the following potential new sources (with BAAQMD Facility Numbers) within six miles of the project:

- #15847-Russell City Energy Center (01-AFC-7C), combustion turbines and heat recovery steam generators, cooling tower, and fire pump diesel engine;
- #00698-Georgia Pacific Gypsum emergency generator;
- #16440-Hayward Public Works emergency generator;
- #16451-Hayward Public Works emergency generator;
- #17037-Elder Care Alliance emergency generator;
- #17548-Alameda County natural gas boiler;
- #17553-Rohm & Haas pyrolysis furnace;
- #17553-Rohm & Haas reg. thermal oxidizer;
- #17621-Skywest emergency generator; and
- #18189-Astra Zeneca emergency generator.

The maximum modeled cumulative impacts are presented below in **Air Quality Table 20**. The total impact is conservatively estimated by the maximum modeled impact plus existing maximum background pollutant levels.

As with impacts from Eastshore alone, maximum cumulative impacts are predicted to occur directly across Clawiter Road (Life Chiropractic College). Cumulative impacts at the closest residences, Ochoa Middle School, and Eden Gardens Elementary School would also be similar to those from Eastshore alone, meaning that impacts from Eastshore dominate the localized cumulative impacts.

AIR QUALITY Table 20
Eastshore, Estimated Localized Cumulative Impacts ($\mu\text{g}/\text{m}^3$)

| Pollutant | Averaging Time | Modeled Impact | Background | Total Impact | Limiting Standard | Percent of Standard |
|-----------------|----------------|----------------|------------|--------------|-------------------|---------------------|
| PM10 | 24 hour | 27.7 | 56.6 | 84.3 | 50 | 169 |
| | Annual | 3.2 | 20.0 | 23.2 | 20 | 116 |
| PM2.5 | 24 hour | 17.3 | 43.9 | 61.2 | 35 | 175 |
| | Annual | 3.2 | 9.4 | 12.6 | 12 | 105 |
| CO | 1 hour | 1,254 | 3,680 | 4,934 | 23,000 | 21 |
| | 8 hour | 394 | 2,178 | 2,572 | 10,000 | 26 |
| NO ₂ | 1 hour | 316 | 143 | 459 | 470 | 98 |
| | Annual | 3.4 | 28 | 31.4 | 100 | 31 |
| SO ₂ | 1 hour | 9.2 | 102 | 111.2 | 655 | 17 |
| | 24 hour | 4.9 | 24 | 28.9 | 105 | 27 |
| | Annual | 0.5 | 8 | 8.5 | 80 | 11 |

Source: AFC Table WKS 4-5 (May 4, 2007; with PM10/PM2.5 revised by staff). PM2.5 is 3-year average of maximum 8th highest (for 98th percentile) 24-hour impact. Includes routine start-up and shutdown events per AFC Table 8.1B-2.

**AIR QUALITY Table 3
Project Operation Emission Impacts**

| Pollutants | Avg. Period | Impacts ($\mu\text{g}/\text{m}^3$) | Background ($\mu\text{g}/\text{m}^3$) | Total Impacts ($\mu\text{g}/\text{m}^3$) | Standard ($\mu\text{g}/\text{m}^3$) | Percent of Standard |
|-----------------|------------------------------------|---|--|--|--|------------------------|
| NO ₂ | 1-hour (start-up) | 77.08 | 143 | 220.08 | 470 ¹ | 47% |
| | 1-hour (steady state) ³ | 226.8 | 143 | 369.8 | 470 ¹ | 79% |
| | Annual | 0.14 | 32 | 32.1 | 100 ² | 32% |
| SO ₂ | 1-hour | 4.92 | 102.2 | 107.12 | 655 ¹ | 16% |
| | 24-hour | 1.1 | 23.5 | 24.6 | 105 ¹ | 23% |
| CO | 1-hour | 1,069.71 | 3,680 | 4,749.71 | 23,000 ¹ | 21% |
| | 8-hour | 178.23 | 2,178 | 2,356.23 | 10,000 ¹ | 23% |
| PM10 | 24-hour | 2.94 | 51.7 | 54.64 | 50 ¹ | 109% |
| | Annual | 0.15 | 18.1 | 18.25 | 20 ¹ | 91% |
| PM2.5 | 24-hour | 2.94 | 39.9 | 42.48 | 65 ² | 65% |
| | Annual | 0.15 | 9.4 | 9.55 | 12 ¹ | 80% |

Notes

1. State standards
2. Federal standards
3. Including impacts from fire pump engine.

Source: RC 2006a.

specified in any condition of certification for the project (CH2MHILL 2007a). For example, as long as the project's total annual NOx emissions, verified once per year, stay at or below the 134.5 tons, then the facility would be considered to be in compliance. The project owner proposed to accept a condition of certification to limit the project's NOx emissions to 134.5 tons a year and agreed to mitigate the project's emission impacts with 102.97 tons of NOx and 51.825 tons of POC ERCs interpollutant traded for NOx, for a total of 154.8 tons NOx and NOx equivalent ERCs (certificates # 815 and 855²). This amount of equivalent NOx credits would satisfy the District's New Sources Review Rule offset requirement, which specifies an offset ratio of 1.15 lbs of ERCs for every new pound of NOx emissions from the facility.

Do the proposed ERCs adequately mitigate the project potential emissions?

As mentioned earlier, the project, as revised, could potentially emit approximately 227.4 tons of NOx per year (see **AIR QUALITY Table 2**), which is much greater than the project owner's proposed annual limit. Additionally, for this particular project, staff believes the facility's contribution to area 1-hour and 8-hour ozone violations may not be properly identified and mitigated because the facility's daily potential NOx emissions are much higher than the calculated equivalent daily ERCs. Note that the number of violations in 2006 of the 8-hour national ozone standard was the highest since 1998, and the number of violations of the 1-hour state ozone standard has been relatively flat since 1998. Both suggest that ozone violations in the Bay Area are real and ongoing.

On any given day, including days that experience ozone violations, staff estimated that the project could potentially emit 2,213 lbs of NOx (see **AIR QUALITY Table 2**) while

² These credits originated from shutting down of equipment at the Potrero power plant in San Francisco and the Pacific Refining Refinery in Hercules (CH2MHILL 2007a).

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| Notice Date | Plant ID | Plant Name | Application # |
|-------------|-------------------------|---|---------------|
| 12/20/07 | B1776 | Tomra Pacific, Inc., Fremont | 16579 |
| 12/19/07 | B8550 | Pacific Infrastructure, Gilroy | 16328 |
| 12/10/07 | B8661 | USA Gasoline Corporation Station No. 20 (Broadbent & Associates, Inc.), San Pablo | 16637 |
| 12/6/07 | B3161 | Russell City Energy Center, Hayward | 15487 |
| 11/29/07 | B8726 | ASC Medical Office, Campbell | 16806 |
| 11/28/07 | B2568 | CalClean, Inc., Oakland | 16676 |
| 11/21/07 | B8148 | Conor Medsystems, Menlo Park | 16681 |
| 11/16/07 | B8537 | City of Burlingame, Burlingame | 16299 |
| 11/14/07 | B2568 | CalClean, Inc. (Edd Clark & Associates, Inc.), Napa | 16470 |
| 11/13/07 | B8468 | Sherwin-Williams Company #4394, San Leandro | 16132 |
| 11/9/07 | B8561 | ConocoPhillips Company (Delta Consultants, Inc.), San Jose | 16353 |
| 11/7/07 | A3360 | Alco Iron & Metal Company, San Leandro | 16042 |
| 11/5/07 | B8612 | Due Torri Coffee, Oakland | 16530 |
| 11/1/07 | B8615 | Verizon Wireless (King Estate), Oakland | 16522 |
| 10/26/07 | B8614 | Verizon Wireless (Willow Pass Park), Concord | 16521 |
| 10/23/07 | B8493 | Versailles, San Mateo | 16215 |
| 10/19/07 | B8573 | Former Mobil Service #99-272 (Environmental Resolutions, Inc.), Santa Rosa | 16427 |
| 10/15/07 | A3360 | Alco Iron & Metal Company, San Leandro | 16042 |
| 10/11/07 | A0187 A0703 A1603 | Pacific Steel Casting, Berkeley | |
| 10/5/07 | B8636 | California Water Service Company, Livermore | 16563 |
| 9/26/07 | B5507 | Point Richmond R&D Associates, Richmond | 16461 |
| 9/19/07 | B8432 | Mt. View Sanitary District, Contra Costa County, Martinez | 16037 |
| 9/19/07 | B8356 | Verizon Wireless (Hwy 101/Julian), San Jose | 15877 |

| | | | |
|---------|----------------|--|----------------|
| 9/14/07 | C8756 | ConocoPhillips Service Station (SS)#251075, San Francisco | 15770 |
| 9/13/07 | B8526 | The Acme Bread Company, Berkeley | 16277 |
| 9/11/07 | B8383 | Nob Hill Masonic Center, San Francisco | 15928 |
| 9/5/07 | B8295 | Luis Norori Antique Restoration, Inc., San Francisco | 15852 |
| 8/31/07 | B3556 | Pacific Bell dba AT&T (RMT, Inc.), Vallejo | 16251 |
| 8/23/07 | B8496 | San Francisco Housing Authority, San Francisco | 16218 |
| 8/23/07 | B8463 | Royal Bakery (TEC Accutite), San Francisco | 16126 |
| 8/22/07 | C3859 | Quick Stop Market #34, San Jose | 15955 |
| 8/15/07 | C0909 | Safeway Store (Fuel Center) #0968, Vallejo | 16145 |
| 8/14/07 | B8481 | Verizon Wireless (Hesperian/A Street), Hayward | 16191 |
| 8/10/07 | B8515 A8025 | Bayer HealthCare Pharmaceuticals, Inc. Novartis Vaccines & Diagnostics, Inc., Emeryville | 16256 16257 |
| 8/3/07 | B8476 | San Francisco Public Utilities Commission (Sunol Yard), Sunol | 16183 |
| 8/3/07 | A7190 | Franklin McKinley School District, San Jose | 16098 |
| 7/30/07 | B8294 | Eye Surgery Center of San Francisco, San Francisco | 15846 |
| 7/27/07 | B8408 | City of San Jose Fire Station #25, Alviso | 15990 |
| 7/23/07 | A0024 | PG&E Hunters Point Power Plant , San Francisco | 14855 |
| 7/13/07 | C8340 | Chevron Service Station #90535, San Francisco | 16162 |
| 6/21/07 | B8147 | Savi Technology, Mountain View | 15500 |
| 6/18/07 | A3887 | San Mateo Medical Center, San Mateo | 15936 |
| 6/1/07 | B8354 | Verizon Wireless (Tully/Senter), San Jose | 15875 |
| 5/31/07 | B2626 | Valero Refining Company, Benicia | 15662 |
| 5/23/07 | B8351 | Verizon Wireless (De Anza/Fremont), Sunnyvale | 15872 |
| 5/18/07 | B8152 | Exxon Service Station (Allterra Environmental, Inc.), Los Gatos | 15512 |
| 5/17/07 | B8377 | Fillmore Development Associates, LLC., San Francisco | 15919 |
| 5/14/07 | B8272 | Exxon Mobile Corporation (Environmental Resolutions, Inc.), Vallejo | 15794 |
| 5/7/07 | B8232 | Contra Costa County Fire Protection District - Fire Station 10, Concord | 15710 |
| 4/25/07 | B8041 | Eastshore Energy Center, Hayward | 15195 |
| 4/24/07 | B8245 | Cal State 9 Credit Union, Concord | 15739 |
| 4/24/07 | B8179 | Douglas Parking Company/Pangea Environmental Services, Inc., Oakland | 15567 |

| | | | |
|---------|-------|---|-------------------------|
| 4/18/07 | B8196 | San Martin Tire/Allterra Environmental, Inc., San Martin | 15592 |
| 4/17/07 | B7988 | Decker Electric Company, Inc., San Francisco | 15634 |
| 4/12/07 | B8103 | Mr. Vincent Agbayani/LFR, Inc., Daly City | 15420 |
| 4/9/07 | B8148 | Conor Medsystems, Menlo Park | 15501 |
| 4/6/07 | B8202 | Turner Automotive (Gallardo & Associates, Inc.), Graton | 15635 |
| 4/6/07 | B7812 | Oakwood Athletic Club, Lafayette | 14660 |
| 4/2/07 | B3161 | Russell City Energy Center, Hayward | 15487 |
| 3/23/07 | B8066 | Menlo Business Park, LLC, Menlo Park | 15306 |
| 3/23/07 | B7900 | RWC, LLC, Cupertino | 15227 |
| 3/15/07 | A0016 | ConocoPhillips San Francisco Refinery, Rodeo, CA | 13424 13678 15328 |
| 3/13/07 | C7629 | ARCO Facility #2082/Capitol Petroleum, Santa Clara | 15616 |
| 2/21/07 | B7693 | Russell Hinton Company, San Francisco | 14368 |
| 2/20/07 | C0950 | Bancroft/Estudillo (Shell SS) #136017, San Leandro | 15620 |
| 2/16/07 | B8091 | Mt. Diablo Unified School District, Concord | 15391 |
| 2/15/07 | C9727 | 7-Eleven #32181, Oakland | 15370 |
| 2/8/07 | B7924 | Broadway Family Apartments, San Francisco | 14923 |
| 1/19/07 | C1387 | Alhambra Shell SS #135573, Martinez | 15393 |
| 1/17/07 | C9193 | Alvarado-Niles Shell SS #136201, Union City | 15356 |
| 1/12/07 | B8070 | Wareham Development, Emeryville | 15309 |
| 1/10/07 | C8529 | Loveridge Road Shell SS #135774, Pittsburg | 15137 |
| 1/8/07 | C5198 | Portola Valley Shell, Inc. SS #135585, Menlo Park | 15395 |

Disclaimer Email comments

Grandview Realty

From: Tim Eichenberg [teichenberg@bcdc.ca.gov]
Sent: Friday, February 08, 2008 12:52 PM
To: Rob Simpson
Subject: Re: Have you received notice?

Rob:

We have not received any communication from the Air Board or the EPA regarding the Russell City power plant. As you know, we met with you on December 27, 2007 in Hayward to thoroughly examine the area, and confirmed that the plant is not located in BCDC's jurisdiction; that is it is not within 100 feet of the mean high tide line or the inland edge of marsh vegetation, and not within a saltpond or managed wetlands as defined in our regulations. This confirms what we told the CEC in December 2007 and December 2006.

In my November 28 email to you, I also indicated that even if it was in our jurisdiction, it does not appear to be located in an area that we identified as inconsistent with the McAteer-Petris Act or the Bay Plan under our 2002 power plant siting study. I also indicated that the project may be subject to review under the federal Coastal Zone Management Act (CZMA).

Under section 307(c)(3)(A) of the CZMA a federal permit located inside or outside of the coastal zone (i.e. BCDC jurisdiction), affecting any land or water use or natural resource of the coastal zone, must provide a certification that the activity complies with the enforceable policies of the state's coastal management program (i.e. BCDC's laws and regs), and will be conducted in a manner that is consistent with the program. Our approved coastal management program lists, as subject to our consistency review, EPA permits for reclassification of land areas under regulations for the prevention of significant deterioration of air quality (PSD). However, at this time, we have not received any certification or communication from the EPA or Air Board that the project does or does not affect the coastal zone, or is or is not consistent with our coastal management program. Nor have we notified the Air Board or the EPA regarding these CZMA requirements. If we receive such a certification or communication we would review the federal permit and notify the agency whether we concur or object to the certification under the CZMA.

I hope this answers your question. Please call if you have any additional concerns.

Tim

Tim Eichenberg, Chief Counsel
SF Bay Conservation & Development Commission
50 California Street, Suite 2600
San Francisco, CA 94111
415-352-3655
415-352-3606 fx

CONFIDENTIALITY NOTICE: This communication and its contents may contain confidential and/or legally privileged information. It is solely for the use of the intended recipient(s). Unauthorized interception, review, use or disclosure is prohibited and may violate applicable laws including the Electronic Communications Privacy Act. If you are not the intended recipient, please contact the sender and destroy all copies of the communication: Thank you.

On 2/8/08 8:37 AM, "Grandview Realty" < > wrote:

From: Grandview Realty [

Sent: Monday, February 04, 2008 10:33 PM

To: 'time@bcdcc.ca.gov'

Subject: Have you received notice?

: The Chief Counsel for the San Francisco Bay Conservation and Development Commission Mr. Tim Eichenberg,

Dear Sir ,

Have you received notice of a preliminary determination of compliance or proposed PSD permit from the Bay Area Air Quality Management District or the Environmental protection Agency for power plants planned in the city of Hayward ? One is Named Russell City Energy Center, the other is named Eastshore Energy Center.

Can you describe the requirements of the coastal zone management act or other authorities within your jurisdiction with respect to the above?

Thank you,

Rob Simpson

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.516 / Virus Database: 269.19.19/1258 - Release Date: 2/4/2008 10:10 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.516 / Virus Database: 269.19.21/1266 - Release Date: 2/8/2008 10:06 AM

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.516 / Virus Database: 269.19.21/1266 - Release Date: 2/8/2008 10:06 AM



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3801

January 24, 2006

Mr. Jack Broadbent
Air Pollution Control Officer
Bay Area AQMD
939 Ellis Street
San Francisco, CA 94109-7799

RE: PSD Re-delegation Agreement

Dear Mr. Broadbent:

EPA appreciates the efforts of your staff to work with us in amending your Prevention of Significant Deterioration (PSD) Delegation agreement between the District and EPA. Under the amended delegation agreement, the District is responsible for the PSD permitting of two new facilities—Ameresco Half Moon Bay LLC and ConocoPhillips - San Francisco Refinery, in addition to the nine power plant projects listed in the previous delegation agreement. I am pleased to enclose a signed copy of the revised PSD delegation agreement. The agreement is effective immediately.

Please contact Laura Yannayon at (415) 972-3534 if you have any other questions related to this matter.

Sincerely,


Deborah Jordan
Director, Air Division

Thanks, Jack!

Enclosure

cc: Brian C. Bungler, Bay Area Air Quality Management District, w/enclosure
Catherine Witherspoon, Executive Officer, California Air Resources Board w/enclosure

U.S. EPA - Bay Area Air Quality Management District
Agreement for Limited Delegation of Authority to Issue and Modify Prevention of
Significant Deterioration Permits Subject to 40 CFR 52.21

The undersigned, on behalf of the Bay Area Air Quality Management District (District) and the United States Environmental Protection Agency (EPA), hereby agree to the limited delegation of authority for the initial issuance or "administrative" or "minor" modification¹ of the Prevention of Significant Deterioration (PSD) permits identified below, subject to the terms and conditions of this agreement. This limited delegation is executed pursuant to 40 CFR 52.21(u), Delegation of Authority.

I. BACKGROUND RECITALS

1. EPA had delegated authority to implement the federal PSD regulations at 40 CFR 52.21 for all sources and modifications to the District on April 23, 1986. On December 31, 2002, EPA finalized revisions to the regulations at 40 CFR 52.21, which became effective on March 3, 2003. 67 FR 80186. The revisions to 40 CFR 52.21 did not significantly alter those portions of 40 CFR 52.21 that concern the issuance of permits for newly constructed "greenfield" sources. See id. at 80187.
2. The District may need to revise its local regulations to fully implement the federal regulations at 40 CFR 52.21, effective March 3, 2003. Accordingly, on March 3, 2003,

¹ The terms "administrative" and "minor" modifications are defined the same as in the EPA memorandum entitled "Revised Draft Policy on Permit Modifications and Extensions" July 5, 1985, by Darryl Tyler, Director, Control Programs Development Division of US EPA Office of Air quality Planning and Standards.

EPA withdrew the delegation of PSD authority from the District. See 68 FR 19371 (April, 21, 2003).

3. Because the federal regulations concerning permit issuance for new sources were not significantly altered effective March 3, 2003, existing District regulations continue to allow the District to implement 40 CFR 52.21 pursuant to a delegation agreement to issue the initial PSD permit(s), or an administrative or minor modification of a PSD permit(s). EPA has determined that District Regulation 2, Rule 2 generally meets the requirements of 40 CFR 52.21; therefore, District permits issued in accordance with the provisions of Regulation 2, Rule 2 will be deemed to meet federal PSD permit requirements pursuant to the provisions of this delegation agreement.

II. APPLICABILITY

1. Pursuant to this delegation, the District shall have primary responsibility for initial issuance or administrative or minor modification of the PSD permit(s) identified below:

Facility:

- a. Delta Energy Center
 - b. Los Medanos Energy Center
 - c. Metcalf Energy Center
 - d. East Altamont Energy Center
 - e. Tesla Power Plant
 - f. Russell City Energy Center
 - g. Delta Power Plant
 - h. Potrero Power Plant
 - i. Ameresco Half Moon Bay LLC
 - j. ConocoPhillips - San Francisco Refinery
2. Permitting History for Delta Energy Center (Delta #12095). The District issued a Preliminary Determination of Compliance (PDOC) on August 12, 1999. Subsequently,

the District issued the Final Determination of Compliance (FDOC) on October 22, 1999. The Prevention of Significant (PSD)/Authority to Construct (ATC) was issued on March 28, 2000. The Title IV/V permit was issued on March 19, 2003 and reissued on November 12, 2003. The Permit to Operate was issued on January 8, 2003, and modified on November 14, 2003.

3. Permitting History for Los Medanos Energy Center (Los Medanos #11866). The District issued a PDOC on March 18, 1999. Subsequently, the District issued the FDOC on June 10, 1999. The PSD/Authority to Construct was issued on September 10, 1999 and the Authority to Construct was superseded on July 2, 2001. The Title IV/V permit was issued on September 1, 2001 and modified on January 13, 2004. The District Permit to Operate was issued on May 19, 2002.
4. Permitting History for Metcalf Energy Center (Metcalf # 12183). The District issued the FDOC on August 24, 2000. The final PSD permit was issued on May 4, 2001. The Authority to Construct was issued on February 13, 2002 and a modification was granted on September 10, 2002.
5. Permitting History for East Altamont Energy Center (East Altamont # 13050). The District issued a PDOC on April 12, 2002. Subsequently, the District issued the FDOC on July 10, 2002. The Western Area Power Administration (WAPA) formally requested that US Fish and Wildlife (US FWS) initiate formal Section 7 consultation on February 11, 2002. The Authority to Construct has not been issued as of May 7, 2004.
6. Permitting History for Tesla Power Plant (Tesla # 13424). The District issued a PDOC on August 6, 2002. Subsequently, the District issued the FDOC on January 22, 2003.

The EPA formally requested that US FWS initiate formal Section 7 consultation on February 21, 2002. The final PSD permit is not issued because of a delay in the issuance of the Biological Opinion associated with Section 7 process. The California Energy Commission conducted an Evidentiary Hearing from September 8 to September 12, 2003. The Commissioners have not made a final determination as of May 7, 2004.

7. Permitting History for Russell City Energy Center (Russell City # 13161). The District issued a PDOC on October 25, 2001. Subsequently, the District issued the FDOC in March 2002 and an Authority to Construct on May 14, 2003. The EPA formally requested that US FWS initiate formal Section 7 consultation on March 11, 2002. The final PSD permit has not been issued because of a delay in the issuance of the Biological Assessment associated with the Endangered Species Act Section 7 process.

8. Permitting History for Delta Power Plant (Delta #18, Unit 8). The District issued a FDOC on February 2, 2001. The final PSD permit and Authority to Construct were issued on July 24, 2001. The Permit to Operate has not yet been issued as of May 7, 2004.

9. Permitting History for Potrero Power Plant (Potrero #26, Unit 7). The FDOC was issued on December 12, 2001. On July 25, 2003, Mirant of California (owner of the Potrero Power Plant) revised their application (#7951) to include a cooling tower system and reduce the annual hours of operation. A draft Biological Opinion and Incidental Take Statement were provide to EPA and the Army Corps of Engineers on April 2, 2003. NOAA Fisheries received comments on the draft Biological Opinion from EPA on May 6, 2003. The comments pertained to a revised description of EPA's federal action regarding the issuance of the air quality permit. EPA comments also stated that the Corps

has agreed to place all terms and conditions contained in the Incidental Take Statement of the April 2, 2003, draft Biological Opinion, in the Corps Section 404 Clean Water Act and in any Rivers and Harbor Act permits. The amended PDOC has not been issued as of May 7, 2004.

10. Proposed permit for Ameresco Half Moon Bay LLC (Plant # 17040). Ameresco is proposing a landfill gas-to-energy facility at the Ox Mountain Landfill located in Half Moon Bay. The applicant proposes to burn landfill gas in spark ignited lean burn reciprocating internal combustion engines. The engine-driven generators will recover energy from landfill gas in the form of electricity.
11. Proposed permit for ConocoPhillips - San Francisco Refinery (Plant # 16).
ConocoPhillips is proposing the "Rodeo Clean Fuels Expansion Project," which will increase capacity of hydrocracking, deisobutanizing, reforming, and sulfur recovery units. The project will include construction of a new hydrogen plant, a new flare, a new furnace for hydrocracking and two new tanks.
12. To allow the District to continue to issue initial PSD permits and/or process administrative and minor modifications to the PSD permit(s) for Delta Energy, Los Medanos, Metcalf, East Altamont, Tesla, Russell City, Delta Power, Potrero, Ameresco and ConocoPhillips, EPA and the District have agreed to this delegation of PSD authority to issue initial permits or make administrative or minor modifications. If any of the facilities subject to this agreement requests a permit modification to incorporate conditions for a plantwide applicability limit, as provided in 40 CFR 52.21(aa), EPA shall process and issue any applications for a permit modification. EPA may review the PSD

permit to ensure that the District's implementation of this agreement is consistent with federal regulations (40 CFR 52.21).

13. The District shall send to EPA a copy of all public notices required by 40 CFR 124.

III. GENERAL CONDITIONS:

1. The District shall request and follow EPA guidance on any matter involving the interpretation of Sections 160-169 of the Clean Air Act or 40 CFR 52.21, relating to the PSD permits for Delta Energy, Los Medanos, Metcalf, East Altamont, Tesla, Russell City, Delta Power, Potrero, Amereesco and ConocoPhillips.
2. The District shall issue PSD permits under this Agreement in accordance with the PSD elements of the District's Regulation 2, Rule 2 and 40 CFR 52.21 as amended on December 31, 2002. Elements of Regulation 2, Rule 2 relating to state law requirements inconsistent with the Clean Air Act and 40 CFR 52.21 and 124, including, but not limited to, elements of Regulation 2, Rule 2 relating to the California Environmental Quality Act, shall not apply to PSD permits under this Agreement.
3. This delegation agreement may be amended at any time by the formal written agreement of both the District and the EPA, including amendment to add, change, or remove conditions or terms of this agreement.
4. If the U.S. EPA determines that the District is not administering the PSD permit identified in this agreement in accordance with the terms and conditions of this limited delegation, the requirements of 40 CFR 52.21, 40 CFR 124, or the Clean Air Act, this delegation, after consultation with the District, may be revoked in whole or in part. Any

such revocation shall be effective as of the date specified in a Notice of Revocation to the District.

5. If the District determines that administering the permits identified in this agreement in accordance with the terms and conditions of this agreement, the requirements of 40 CFR 52.21, 40 CFR 124, or the Clean Air Act conflicts with State or local law, or exceeds the District's authority or resources to fully and satisfactorily carry out such responsibilities, the District after consultation with EPA, may remand administration of these permits to EPA. Any such remand shall be effective as of the date specified in a Notice of Remand to EPA.
6. The permit appeal provisions of 40 CFR 124, including subpart C thereof, pertaining to the Environmental Appeals Board (EAB), shall apply to all appeals to the Administrator on permits and modifications to permits issued by the District under this delegation. For purposes of implementing the federal permit appeal provisions under this delegation, if there is a public comment requesting a change in a draft preliminary determination or draft permit conditions, the final permit issued by the District shall contain a statement that for Federal PSD purposes and in accordance with 40 CFR 124.15 and 124.19, (1) the effective date of the permit shall be 30 days after the date of the final decision by the District to issue, modify, or revoke and reissue the permit; and (2) if an appeal is made to the EAB through the Administrator, the effective date of the permit shall be suspended until such time as the appeal is resolved. The District shall inform EPA Region IX in accordance with conditions of this delegation when there is public comment requesting a change in the preliminary determination or in a draft permit condition. Failure by the

District to comply with the terms of this paragraph shall render the subject permit invalid for Federal PSD purposes.

7. Pursuant to the provisions of 40 CFR 52.21(u)(2), the District shall consult with the appropriate State or local agency primarily responsible for managing land use prior to making any determinations under this Agreement.
8. Nothing in this agreement shall prohibit EPA from enforcing the PSD provisions of the Clean Air Act, the PSD regulations or any PSD permit issued by the District pursuant to this agreement. In the event that the District is unwilling or unable to enforce a provision of this delegation with respect to a source subject to the PSD regulations, the District will immediately notify the Air Division Director. Failure to notify the Air Division Director does not preclude EPA from exercising its enforcement authority.
9. This limited delegation of PSD authority becomes effective upon the date of the signatures of both parties to this Agreement.

1/5/06
Date


Jack P. Broadbent
Executive Officer/APCO
Bay Area Air Quality Management District

1/20/06
Date


Deborah Jordan
Director, Air Division
U.S. EPA, Region IX



Cabrillo Boulevard

tidal Channel

RCEC 75dBA+

habitat 493 feet

cogswell salt marsh harvest mouse preserve

Wetlands 700 feet

edge 97ft 44dBA

Breakwater Avenue

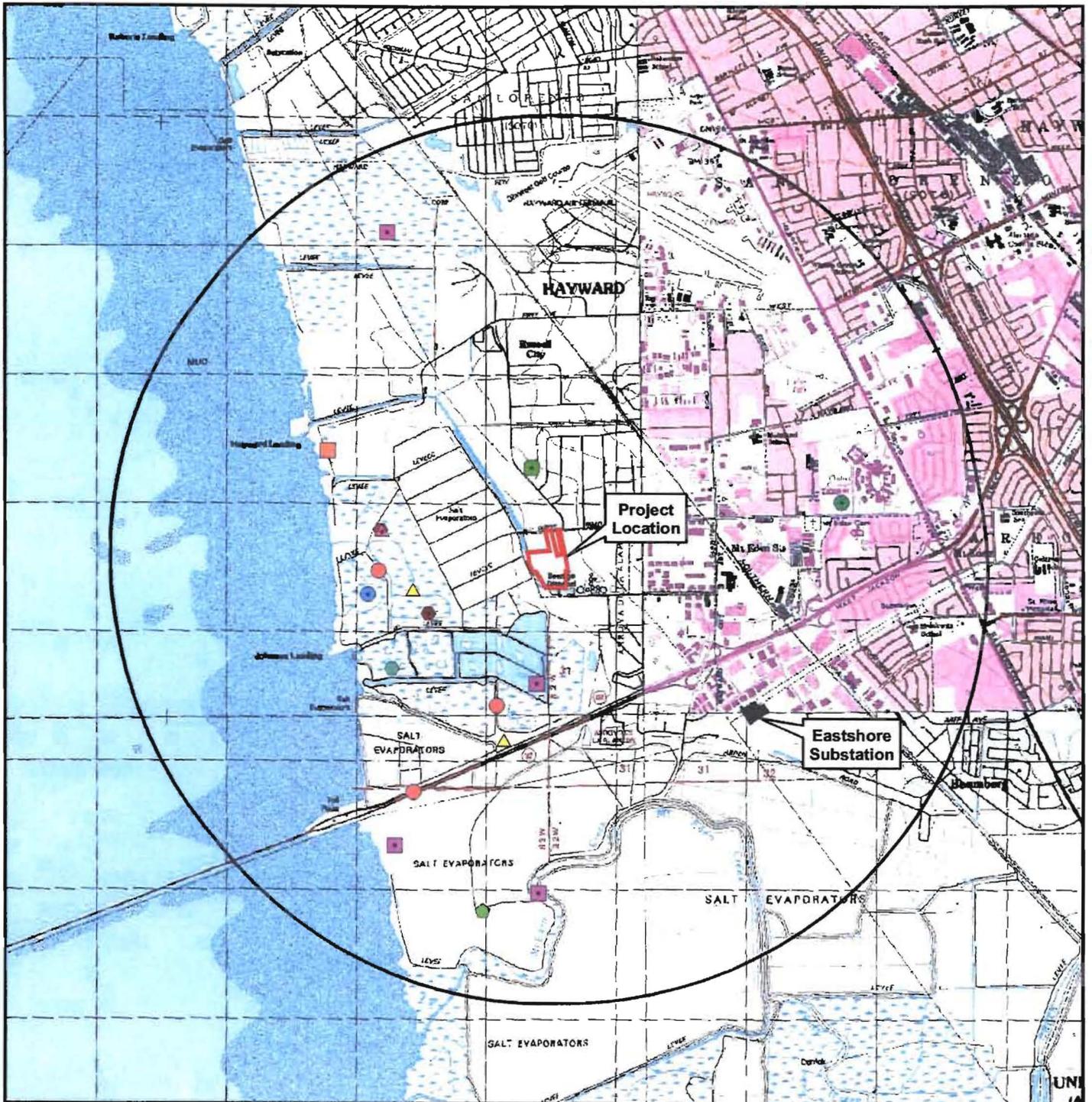
© 2008 National Geographic Society
© 2008 Tele Atlas Shoreline Interpretive Center
© 2008 Europa Technologies
Image © 2008 TerraMetrics

Google

Pointer 37°37'53.32" N 122°08'31.55" W elev 6 ft

Streaming 100%

Eye all 7261



LEGEND

ANIMALS

- ALAMEDA SONG SPARROW
- CALIFORNIA BLACK RAIL
- ▲ CALIFORNIA CLAPPER RAIL
- ◆ CALIFORNIA LEAST TERN
- BLACK SKIMMER
- NORTHERN HARRIER
- SALT-MARSH HARVEST MOUSE
- ▲ SALT-MARSH WANDERING SHREW
- WESTERN SNOWY PLOVER

PLANTS

- ★ CONGDON'S TARPLANT
- CONTRA COSTA GOLDFIELDS
- ALKALI MILK-VETCH
- ◆ HAIRLESS POPCORN-FLOWER
- RCEC LOCATION
- 2 MILE BUFFER
- EASTSHORE SUBSTATION

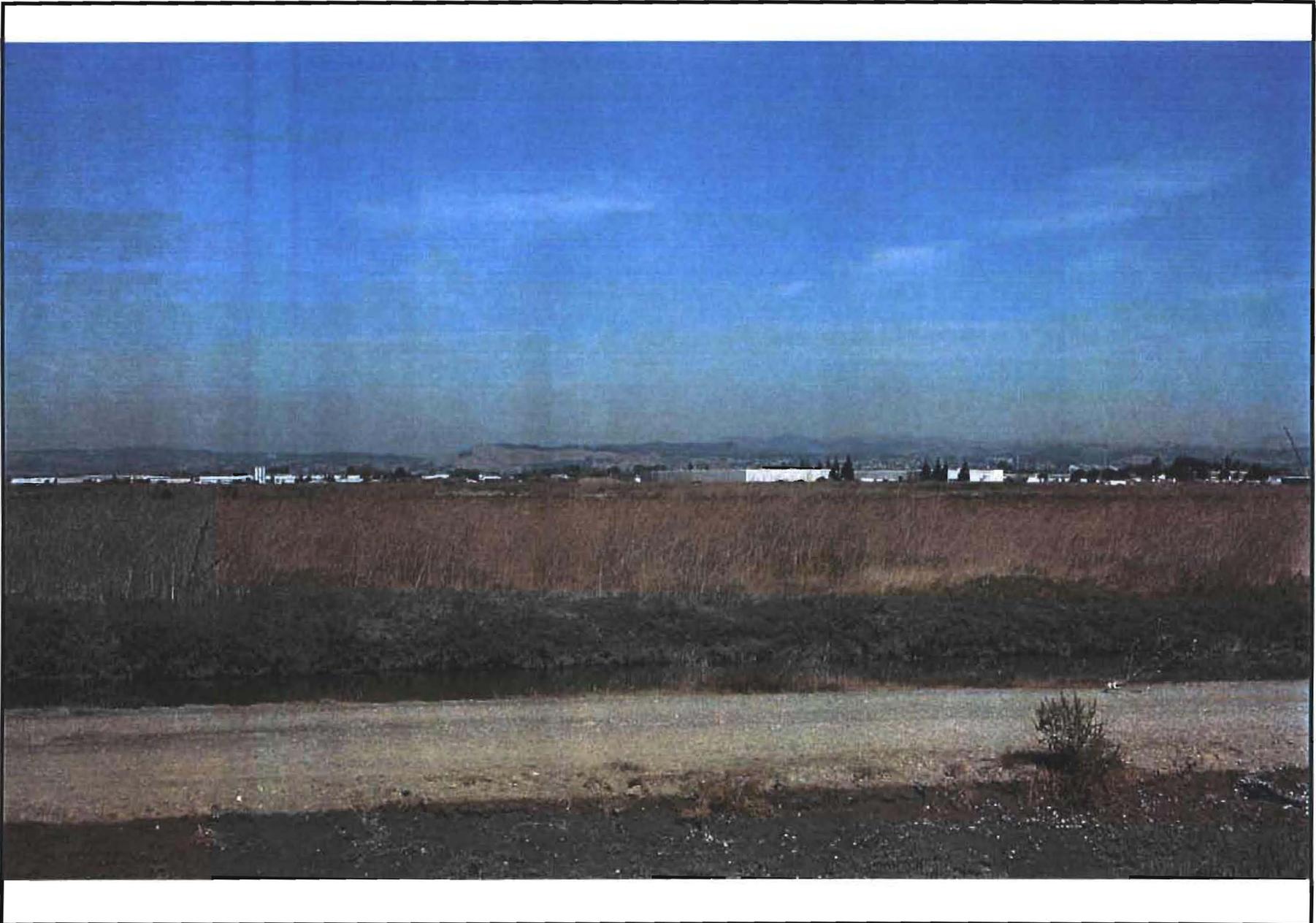


FIGURE 3.2-1
SPECIAL STATUS SPECIES
RECORDED IN STUDY AREA
 RCEC AMENDMENT #1
 HAYWARD, CALIFORNIA

VISUAL RESOURCES - FIGURE 11

Russell City Energy Center Project - KOP 2 - Existing View from Hayward Shoreline Interpretive Center

JUNE 2007



VISUAL RESOURCES

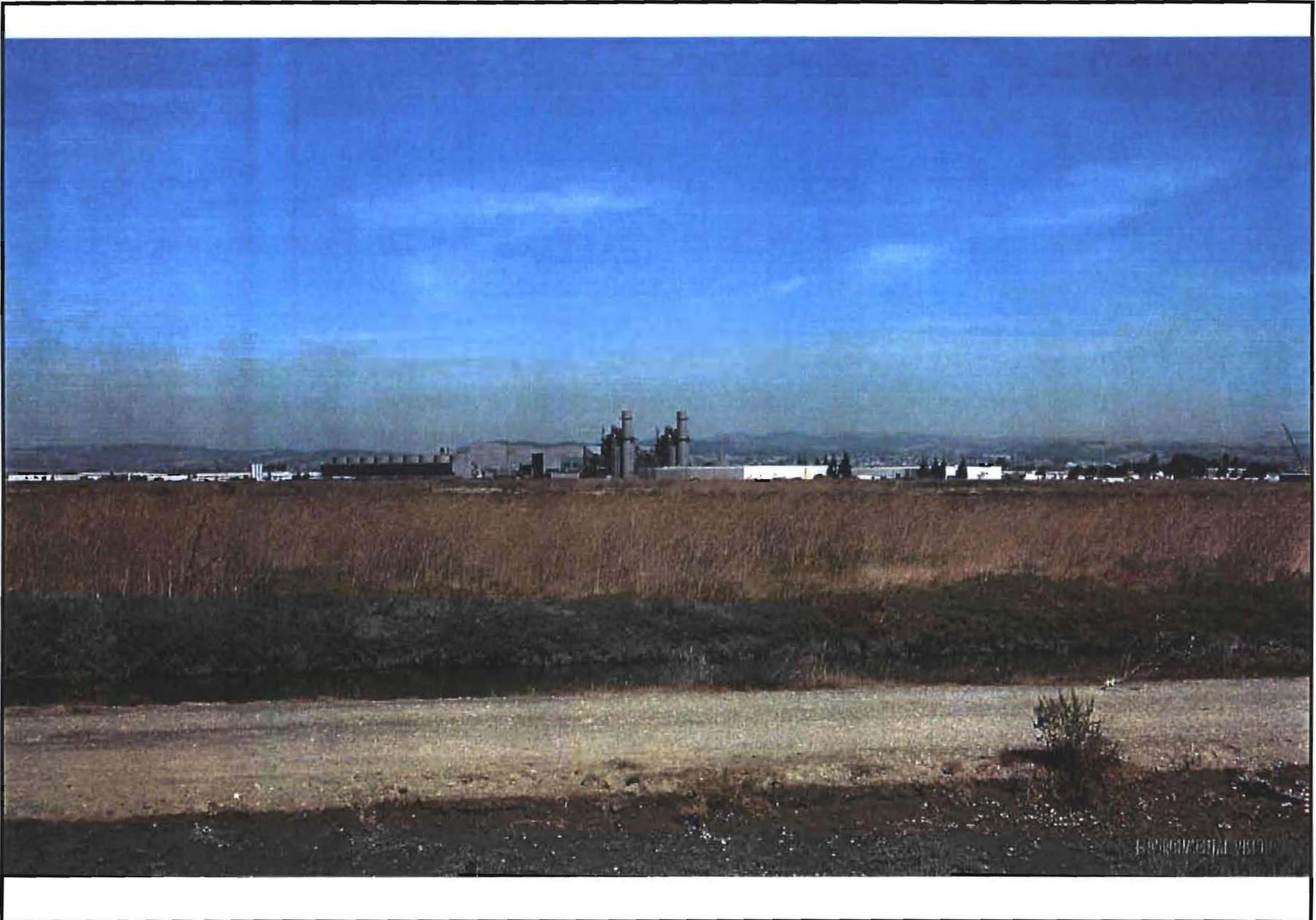
CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy C Amendment No.1 - Figure 3.12-3, A

VISUAL RESOURCES - FIGURE 12

Russell City Energy Center Project - KOP 2 - Existing View with the Photo Simulated Amended Project

JUNE 2007



VISUAL RESOURCES

12/11/01

Tom Roemer

CARB

916-327-0481

General comments on PDOC

- (1) offsets of POC
in PDOC offset required is 28.5 ton/yr,
however states 27.8 tons in Appendix.
- (2) Permit cond # 48
typo - refers to 'Metcalf'
- (3) be careful about emissions of
acrolein - hot topic
- (4) PM_{10} emissions as modeled exceed
state standards. In fact background
 PM_{10} exceed state standards. Would
like a narrative included to address
this.
- (5.) CARB most likely will not prepare
written comments.

10/3/07 - CEC, Tuan Ngo

(1) Does not believe it is too late to include diesel PM₁₀ mitigation in mitigation plan

- send to CEC for consideration
- in hindsight, should have made provision in conditions for alternate plan
- CEC would welcome mitigation that includes diesel PM
- stick w/ 1:1 ratio for PM₁₀
Gary Rubenstein ~~tried to~~ proposed a greater than 1:1 ratio before, but not well received by CEC
- did not look into diesel PM₁₀ or any other source. Calpine ~~was~~ was anxious to proceed w/ fireplace plan
- buses in the Bay Area. How about Miami buses?
- Los Esteros - school bus mitigation did not get the proper offset based on cost of plan.

(2) Ralph Bowman
Los - Esteros

Fireplace retrofit/

\$180K to administrative program
not many residences

- direct mail

- not much participation

- expand to 15 miles ^{miles - S.D.} Santa Cruz

did not result in full mitigation
provider money to him for 2 buses.

11/1

Chairman Sustainability

- Rob Simpson

Hayward

510-909-1800

RCEL

1990 - NOx

operated the
peaker
stop

→ 2005 - Metcalf

review at commission level

Not clear -
adequate?
rapid/quite fast
recommended by CEC
why not BACT?
not demonstrated

11/ ~~Ernie~~ Pacheco

510-323-5136

RCEL

37mm sq ft of roof
producing 163 MW

11/19

(1) Ernie Pacheco

Called Tuan Ngo, Mike Todd.

(2) Tracy Lee

call Jim Hsu

dropped off pre-filter

11/27

(1) Marian
microturbine
field
permit

output vs input
749-5034

1/29
(2)

Rob Simpson
plants - fast start
approved - not demonstrated
510-909-1806

(2) Rob Simpson
A.C.

(tax) BCDC
510-583-3201

Nov. 1, 2007

510-909-1800

Grandview @ Concorc. net

(3) Vic P

Jensu Precast

visit for inspection
requesting

re: fiberbond

B1546

3/18/04 closed

916-991-8800

Brandon Dayoan

manufac

precast concrete

long 4/05

an granby wal

AIR QUALITY

Testimony of Tuan Ngo, P.E.

SUMMARY OF CONCLUSIONS

Staff finds that, with the adoption of the attached conditions of certification, the proposed amendment to the Russell City Energy Center (RCEC) would comply with all applicable laws, ordinances, regulations, and standards (LORS) and would not result in any significant air quality-related impacts. Staff also finds that:

- The project ozone precursor emissions (oxides of nitrogen (NO_x) and precursor organic compounds (POC) would be mitigated to a level of less than significant by the surrender of emission reduction credits (ERCs or offsets), or the installation of suggested technologies to reduce start-up time;
- The project would comply with the Bay Area Air Quality Management District (District) Rules and Regulations, including the New Source Review requirements;
- The project would not cause new violations of any nitrogen dioxide (NO₂), sulfur dioxide (SO₂), or carbon monoxide (CO) ambient air quality standards, and therefore, its emission impacts are not significant for those pollutants;
- The project's particulate matter less than 10 and 2.5 microns (PM₁₀/PM_{2.5}) emissions contribution would be mitigated to a level that is less than significant by the surrender of sulfur oxides and PM₁₀/PM_{2.5} ERCs and/or the successful implementation of the wood stove/fireplace improvement program; and
- The project's PM₁₀ construction impacts would be mitigated to a level that is less than significant.

INTRODUCTION

On November 17, 2006, Russell City Energy Company, LLC ("project owner"), filed a petition to modify the September 11, 2002, California Energy Commission's Decision (Decision) approving the RCEC (01-AFC-07). The proposed modifications would move the project facilities approximately 1,300 feet from the originally permitted location, to a site southwest of the intersection of Depot Road and Cabot Boulevard. In addition, the project owner also requested to amend numerous conditions of certification to reflect the following changes:

1. Reducing the combustion turbines' NO_x emissions to conform to the District's Best Available Control Technology (BACT) emission limit.
2. Installing new oxidation catalyst systems to reduce the combustion turbine CO emissions.
3. Revising the project's fuel use and emission limits for NO_x, POC, CO, sulfur dioxide (SO_x), and PM₁₀ and PM_{2.5} emissions.
4. Eliminating the previously approved emergency generator and engine.
5. Replacing the previously approved fire pump Cummins engine with a Clarke engine.

6. Deleting the requirement that restricts simultaneous start up of the combustion turbines.
7. Revising the project's PM10/PM2.5 mitigation plan to include the use of ERCs or interpollutant trading.
8. Administrative revisions to various air quality conditions of certification.

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

The project's proposed amendment is subject to all the LORS described in the Final Staff Assessment (FSA) (CEC 2002a).

Staff has received a copy of the District's Amended Preliminary Determination of Compliance (PDOC) (BAAQMD-2007) for the requested amendment to the project, issued on April 2, 2007. The PDOC included a set of Air Quality conditions that are drafted to ensure continuous compliance during construction and operation of the facility. Staff has incorporated the District conditions in this Staff Assessment.

SETTING

Since the project is being proposed to move its foot print 1,300 feet from the original site, staff does not expect that the project settings have changed from the original FSA. For convenience, staff includes a table, **AIR QUALITY Table 1**, which summarizes the area's attainment status for various applicable state and federal air quality standards.

AIR QUALITY Table 1 BAAQMD Attainment Status

| Pollutant | Averaging Time | California Status | Federal Status |
|-------------------------------------|-----------------------|--------------------------|-----------------------|
| Ozone (O ₃) | 8 Hour | N/A | Non-attainment |
| | 1 Hour | Non-attainment | N/A |
| Carbon Monoxide (CO) | 8 Hour | Attainment | Attainment |
| | 1 Hour | Attainment | Attainment |
| Nitrogen Dioxide (NO _x) | Annual | N/A | Attainment |
| | 1 Hour | Attainment | N/A |
| Sulfur Dioxide (SO ₂) | Annual | N/A | Attainment |
| | 24 Hour | Attainment | Attainment |
| | 1 Hour | Attainment | N/A |
| PM10 | Annual | Non-attainment | Attainment |
| | 24 Hour | Non-attainment | Unclassified |
| PM2.5 | Annual | Non-attainment | Attainment |
| | 24 Hour | N/A | Attainment |

Notes:

Unclassified means the area is treated as it is attainment
 N/A= no standard applies or not applicable

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The facility was certified in 2002. The annual criteria emissions and mitigation were specified in the Decision. In this proposed revision to the Decision, the facility's annual emission limits, except PM10/PM2.5, would not change. The facility's PM10/PM2.5 annual emission limit would increase slightly from 86.4 tons per year (TPY) to 86.8 TPY. However, the facility's daily and hourly emissions limits for all but PM10/PM2.5 could increase significantly. As such, staff will analyze the project's short-term impacts to verify that the project would not cause a new violation or make worse an existing violation of any applicable air quality standards in the area.

There are two criteria that staff used to determine whether the project emissions would be significant. The first is the status of the ambient air quality standards in the area. Staff considered that all non-attainment air contaminants and their precursors released during the construction and operation of this facility are significant and must be mitigated appropriately. For example, the area is currently non-attainment for ozone and PM10 and PM2.5; therefore, all directly emitted PM10, and PM10 and ozone precursors (NO_x, POC and SO_x) that the facility released during construction and operation would potentially cause significant impacts through their contribution to the existing violations of the standards and interfere with the applicable air quality plan.

The second criterion that staff used is whether the project's construction and operational emissions would cause a new violation to the ambient air quality standards. Air dispersion models provide a means of predicting the location and ground level magnitude of the impacts of a new emissions source. These models consist of several complex series of mathematical equations, which are repeatedly calculated by a computer for many ambient conditions. In general, the inputs for the modeling include stack information (exhaust flow rate, temperature, and stack dimensions), specific turbine emission data and meteorological data, such as wind speed, atmospheric conditions, and site elevation. The model results are often described as a unit of mass per volume of air, such as micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Staff added the modeled impacts to the available highest ambient background concentrations recorded during the previous three years from nearby monitoring stations. Staff then compared the results with the ambient air quality standards for each respective air contaminant to determine whether the project's emission impacts would cause a new violation of the ambient air quality standards or if the emissions would contribute to an existing violation.

The ambient air quality standards that staff used as a basis for determining project significance are health-based standards. They are set at levels to adequately protect the health of all members of the public, including those most sensitive to adverse air quality, such as the aged, people with existing illnesses, and infants and children, while providing a margin of safety.

PROJECT AMENDMENT DESCRIPTION

The project owner asked to amend the RCEC project as follows:

- Move the facility approximately 1,300 feet northwest of the original location;
- Revise the turbines' NOx emissions from 2.5 to 2 parts per million at 15 percent oxygen (ppm @ 15 % O₂) to reflect the District BACT standard;
- Install a CO oxidation catalyst system to ensure compliance with the turbines' CO emission limits as licensed in the original application;
- Revise the facility's commissioning emissions that would increase the daily and hourly emissions of CO, POC, and SOx, and slightly decrease the daily PM10/PM2.5 emissions;
- Increase fuel consumption rates of turbines from 2,179 to 2,238.6 million British Thermal Units (mmBTU) per hour;
- Increase the turbines' NOx, CO and POC emission limits during start-up and shut down periods;
- Eliminate previous licensing condition that restricts the simultaneous start up of the turbines;
- Increase the facility's daily emission limits of NOx, CO, POC and SOx;
- Reduce the facility's daily PM10/PM2.5 emission limit;
- Increase the facility's annual PM10/PM2.5 emissions limit;
- Revise the mitigation package for the facility's PM10/PM2.5 emissions;
- Increase the cooling tower recirculation water total dissolved solids (TDS) concentration from 2,000 to 8,000 (ppm);
- Realigned the cooling tower from a north-south orientation to a northwest-southeast orientation; and
- Remove the standby generator and engine that was approved as part of the original project.

It should be noted that even as the short term emission limits are proposed to increase, the project owner has not proposed to change the annual emission limits.

DIRECT/SECONDARY IMPACTS AND MITIGATION

Staff assessed three kinds of primary and secondary¹ impacts: construction, operational, and cumulative effects. Construction impacts result from the emissions occurring during the site preparation and construction of the project. The operational impacts result from the emissions of the proposed project during normal operation, which include maintenance, start-ups and shutdowns. Cumulative impacts result from the proposed project's incremental effect viewed over time, together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project. (Pub. Resources Code § 21083; Cal. Code Regs., tit. 14, §§ 15064(h), 15065(c), 15130, and 15355.)

¹ Primary impacts potentially result from facility emissions of NOx, SOx, CO and PM10/2.5. Secondary impacts result from air contaminants that are not directly emitted by the facility but formed through reactions in the atmosphere that result in ozone, and sulfate and nitrate PM10/PM2.5.

Construction Impacts and Mitigation

Staff reviewed the amendment request and finds that the construction of RCEC would result in emissions and impacts that are no different from those evaluated in the original application. Thus staff believes there is no need to conduct a new analysis for the project construction emission and impacts. However, staff recommends the use of standard construction conditions **AQ-SC1** to **AQ-SC5** in place of the standard construction conditions AQ-C1 through AQ-C4 in the Decision. The new standard construction conditions reflect current United States Environmental Protection Agency (USEPA) and the California Air Resources Board (ARB) engine requirements that match the new construction schedule, and address potential impacts and provide mitigation.

Operation Impacts and Mitigation

The project owner requested that the project be analyzed without an assumed number of start-up, shutdowns, or hours of operation over a year. The project owner submitted information related to the potential maximum hourly, daily and annual emissions (RC 2006a, Table 3.1-3, and Appendix Table 3.1-4), but they requested that the facility be certified with specific conditions that restrict the annual operation of the facility based solely on the annual emission limits of NO_x, CO, POC, SO_x and PM₁₀/PM_{2.5} (RC 2006a, pp. 8). These annual emission limits would be set in accordance with the available ERCs that the project owner proposed to provide to mitigate the project emission impacts.

Staff had problems duplicating the project owner's submitted facility emissions, and requested clarifications of the emission estimates. Staff re-calculated the facility's emissions, attached as an **AIR QUALITY Appendix 1** to this analysis. Staff summarized and tabulated the results of **AIR QUALITY Appendix 1** for the facility's expected maximum hourly, daily and annual emissions for NO_x, POC, PM₁₀, SO_x and CO in **AIR QUALITY Table 2** below.

The emissions listed in the first three rows of **AIR QUALITY Table 2** are the maximum potential of criteria air contaminants of each turbine operating in different modes, i.e., during commissioning when air pollution control equipment may not fully engaged, during start up, and during normal operation when all control devices are fully operated. The next few rows show the facility maximum potential emissions on a daily and annual basis. These maximum potential emissions were calculated by staff (see **AIR QUALITY Appendix 1**) using information provided by the project owner. For example, the maximum daily emissions were calculated by using the emissions of two start up/shut down cycles for each turbine (RC 2006a, RC 2007a) and 16 hours of normal operation. The annual potential to emit emissions in **AIR QUALITY Table 2** (row 7) was also calculated by staff using the operating hours provided by the project owner (8,464 hours per turbine per year), the owner provided start up and shut down emissions and the number of start up/shut down cycle (RC 2007a). And the bottom row shows the annual emission limits that the project owner wishes to be incorporated into the license. The whole purpose of **AIR QUALITY Table 2** was to show the different between the facility's maximum potential emissions compare to the limits that the project owner wanted to accept.

AIR QUALITY Table 2
Facility's Potential and Estimated Hourly, Daily and Annual Emissions

| Equipment | NOx | POC | SOx | CO | PM10 ¹ |
|---|--------------|--------------------|-------------------|---------------|-------------------|
| Maximum Hourly Emissions (lb/hr) | | | | | |
| Turbine/HRSG during commissioning ² | 400 | 123.7 ⁵ | 74.4 ⁵ | 5,000 | 108 ⁵ |
| Turbine/HRSG (start-up) | 97.2 | 19.2 ⁵ | 5.5 ⁵ | 1348.8 | 10.8 ⁵ |
| Turbine/HRSG (normal operation) | 16.17 | 2.82 | 6.2 | 19.69 | 9 |
| Cooling tower | - | - | - | - | 2.83 |
| Maximum Daily Emissions (lb/day)³ | | | | | |
| Daily Emissions (during commissioning) ³ | 4,805 | 495 | 297.6 | 20,000 | 432 |
| Daily Emissions (normal operation) ³ | 2,212.8 | 431 | 300 | 19,603 | 500 |
| Annual Potential to Emit ⁴ (tons/year) | 227.4 | 42.5 | 13.08 | 1,346 | 87.1 |
| Reasonably Expected Emissions⁶ | | | | | |
| Daily Normal (lbs/day) | 848 | 156 | 67 | 3200 | 476 |
| Proposed Annual Limits (tons/year)⁷ | 134.6 | 28.5 | 12.2 | 584.18 | 86.8 |

Notes:

1. All PM10 emissions from natural gas combustion are treated as PM2.5 (California Emission Inventory and Reporting System, CARB).
2. The turbine/HRSG maximum hourly emissions occur during commissioning (Table 3.1-22).
3. Daily emissions include 2 start-ups (480 pounds NOx per cold start-up, 240 pounds NOx per hot start-up), 2 shut downs (80 pounds of NOx per each), and approximate 14 hours (16.17 pounds NOx/hr) of normal operation for the turbine/HRSG and duct firing.
4. Staff estimated 8,364 hours per turbine per year operation, see **AIR QUALITY Appendix 1**.
5. Staff estimated, see **AIR QUALITY Appendix 1**.
6. Staff estimated using one hot or warm start, followed by 16 hours of normal operation and one shut down for each calendar day.
7. Project owner proposed annual emission limits.
Source: AFC Amendment Request Section 6 (RC 2006a)

The project owner provided an air quality modeling analysis using the EPA-approved ISCST3 model to estimate the impacts of the project's directly emitted NOx, PM10, CO, and SOx emissions resulting from project operation (RC 2006a). The results of the modeling analysis for turbines, fire pump engine and cooling tower are shown in **AIR QUALITY Table 3**. The modeling analysis showed that the project does not cause any new violations of NO₂, CO or SO₂ air quality standards, even with recent worst-case ambient concentrations used as background. The project, however, would contribute to existing violations of the state 24-hour and annual PM10 standards, the state annual PM2.5 standard, and the state 1-hour and the federal 8-hour ozone standards. Therefore, staff recommends that mitigation, in the form of ERCs for particulate matter and its precursors and ozone and its precursors be provided.

MITIGATION

Ozone Precursors: NOx

The project owner has requested that staff evaluate the project emissions and mitigation from just the project's annual emission limitations that would be specified in a condition of certification. The project owner requested that no specific number of start-ups, shutdowns, or hours of operation restrict the project's operation, and that these not be

AIR QUALITY Table 3
Project Operation Emission Impacts

| Pollutants | Avg. Period | Impacts ($\mu\text{g}/\text{m}^3$) | Background ($\mu\text{g}/\text{m}^3$) | Total Impacts ($\mu\text{g}/\text{m}^3$) | Standard ($\mu\text{g}/\text{m}^3$) | Percent of Standard |
|-----------------|------------------------------------|---|--|--|--|------------------------|
| NO ₂ | 1-hour (start-up) | 77.08 | 143 | 220.08 | 470 ¹ | 47% |
| | 1-hour (steady state) ³ | 226.8 | 143 | 369.8 | 470 ¹ | 79% |
| | Annual | 0.14 | 32 | 32.1 | 100 ² | 32% |
| SO ₂ | 1-hour | 4.92 | 102.2 | 107.12 | 655 ¹ | 16% |
| | 24-hour | 1.1 | 23.5 | 24.6 | 105 ¹ | 23% |
| CO | 1-hour | 1,069.71 | 3,680 | 4,749.71 | 23,000 ¹ | 21% |
| | 8-hour | 178.23 | 2,178 | 2,356.23 | 10,000 ¹ | 23% |
| PM10 | 24-hour | 2.94 | 51.7 | 54.64 | 50 ¹ | 109% |
| | Annual | 0.15 | 18.1 | 18.25 | 20 ¹ | 91% |
| PM2.5 | 24-hour | 2.94 | 39.9 | 42.48 | 65 ² | 65% |
| | Annual | 0.15 | 9.4 | 9.55 | 12 ¹ | 80% |

Notes

1. State standards
 2. Federal standards
 3. Including impacts from fire pump engine.
- Source: RC 2006a.

specified in any condition of certification for the project (CH2MHILL 2007a). For example, as long as the project's total annual NO_x emissions, verified once per year, stay at or below the 134.5 tons, then the facility would be considered to be in compliance. The project owner proposed to accept a condition of certification to limit the project's NO_x emissions to 134.5 tons a year and agreed to mitigate the project's emission impacts with 102.97 tons of NO_x and 51.825 tons of POC ERCs interpollutant traded for NO_x, for a total of 154.8 tons NO_x and NO_x equivalent ERCs (certificates # 815 and 855²). This amount of equivalent NO_x credits would satisfy the District's New Sources Review Rule offset requirement, which specifies an offset ratio of 1.15 lbs of ERCs for every new pound of NO_x emissions from the facility.

Do the proposed ERCs adequately mitigate the project potential emissions?

As mentioned earlier, the project, as revised, could potentially emit approximately 227.4 tons of NO_x per year (see **AIR QUALITY Table 2**), which is much greater than the project owner's proposed annual limit. Additionally, for this particular project, staff believes the facility's contribution to area 1-hour and 8-hour ozone violations may not be properly identified and mitigated because the facility's daily potential NO_x emissions are much higher than the calculated equivalent daily ERCs. Note that the number of violations in 2006 of the 8-hour national ozone standard was the highest since 1998, and the number of violations of the 1-hour state ozone standard has been relatively flat since 1998. Both suggest that ozone violations in the Bay Area are real and ongoing.

On any given day, including days that experience ozone violations, staff estimated that the project could potentially emit 2,213 lbs of NO_x (see **AIR QUALITY Table 2**) while

² These credits originated from shutting down of equipment at the Potrero power plant in San Francisco and the Pacific Refining Refinery in Hercules (CH2MHILL 2007a).

the emissions reduction credits provided would only equal 848 lbs per day on an equivalent basis, which is approximately 38 percent (848 lbs/2,213 lbs) of the project's potential emissions for NOx. It should be noted that the project owner has stated the staff estimated facility's daily NOx potential emissions (**AIR QUALITY Table 2**) are based on a rare event, which could only happen a few times in a year.

Do the proposed ERCs adequately mitigate the project's expected daily emissions?

The project owner has asserted that the more typical, normal operating day of the facility could include a hot start-up, about 16 hours of normal operation followed by a shutdown. Staff believes that this pattern is consistent with operations data from other combined cycle facilities in the state. Therefore, staff attempted to estimate a reasonably expected operating profile for the facility and the associated emissions, and verify whether the proposed ERCs could adequately mitigate the facility emissions.

Staff estimated probable daily facility NOx emissions to be approximately 1,093 lbs per day (see **AIR QUALITY Appendix 1**) from one hot start-up followed by 14 hours of normal operation and one shutdown each day for each gas turbine/HRSG power unit. Even at this level, the proposed ERCs of 848 lbs of NOx a day would mitigate only 78 percent³ of the facility emission impacts on any given day.

The District's PDOC contains a facility NOx emissions limit of 1,553 pounds per day (BAAQMD - 2007), which is also twice the amount of ERCs proposed. Thus, regardless of whether the facility operated in maximum worst-case or reasonably expected case, the provided ERCs would not adequately mitigate the project's daily NOx emission impacts.

Is there alternative technology that can reduce the project's emission liability?

The project, as proposed, is designed to operate most efficiently in base load mode. The project owner is interested in operating the facility as a load-following facility, i.e., frequent, or daily start-ups and shutdowns. The majority of the facility daily NOx emissions are caused by start-up and shutdown events, as shown in **AIR QUALITY Table 2**, where hourly start-up emissions rates are six, seven and 68 times higher than normal operation for NOx, POC and CO, respectively. Because of this, staff investigated if design changes to the project could shorten start-up durations and reduce start-up emissions. Staff found that if the project used the Siemens-Westinghouse Benson Once-Through boiler technology, start-up and shutdown emissions would be significantly reduced such that the proposed offsets would be adequate to mitigate the project's daily NOx emissions. Alternatively, some projects have incorporated an auxiliary boiler or solar array to provide steam that can shorten start-up times.

According to a vendor of this technology, the Siemens-Westinghouse, Benson Once-Through or Fast-Start technology can be designed to fit the proposed 501 FD combustion turbines without additional capital costs above that of the standard, off-the-

³ 848 lbs/day divided by 1093 lbs/day = 0.78 or 78 percent

shelf, HRSG that the project owner has proposed⁴. If the project is built with the aforementioned Fast-Start technology, the project start-up NOx emissions are expected to be reduced from the proposed 480 lbs to 22 lbs for each cold start-up event, and from 240 lbs to 28 lbs for hot or warm start-up events. This represents a 95 percent and 88 percent emission reduction of NOx for cold, and hot or warm start-up events, respectively. In addition to reducing the facility's NOx and POC emissions, the use of Fast-Start technology at the RCEC would result in cost saving from less fossil fuel used to create steam that is vented during start-ups. Staff has not estimated the actual fuel savings because this cost will tie directly to how many start-up and shutdown cycles the facility has during a year.

Staff believes that the Siemens-Westinghouse Fast-Start technology is an alternative technology that would mitigate the project impacts to the environment; Staff therefore recommends that, unless the project owner accepts conditions that restrict the start-up duration and emissions, the RCEC should be built employing the Fast-Start technology or its equivalent to reduce the start-up and shutdown event emissions. Staff's recommendation is incorporated into Condition of Certification **AQ-SC7** through **-SC10**.

Alternatively, the 600 MW combined cycle Palomar Project in Escondido has installed a proprietary control system, OpFlex from General Electric, which allows ammonia to be injected at the earliest time to shorten start-up times and reduce start-up emissions at the facility. Preliminary, non-optimized results from their March 7, 2007, Petition for Variance 4703 Extension indicated that they have reduced NOx emissions from 120 lbs to 28 lbs for hot or warm start-up events.

Staff provided a comment on May 29, 2007, to the District on the PDOC for RCEC that the District consider hardware and software modifications to the project to shorten start-up times and significantly reduce start-up emission as BACT.

Is there alternative operational change that can reduce the facility emission liability?

The project owner claims that redesign of the project with Fast-Start technology would involve significant costs as they have purchased some equipment and designed the project and systems. These cost increases and redesign may require extensive renegotiations with their financing entities. However, Staff notes that the El Segundo Power Redevelopment Project (00-AFC-14), in order to meet changing electricity market demands, just filed a major amendment (June 15, 2007) redesigning their project from a "traditional" combined cycle to a Rapid Response Combined Cycle that will use Siemens combustion turbines (replacing the previously approved GE CTGs) and Benson once-through boilers.

Staff has asked for and the project owner has provided an expected operational scenario for the facility. The owner states that most likely, each turbine would undergo a cold start-up and combustor tuning about once a year. This is the activity that causes the highest start-up emissions of 480 lbs of NOx per start; most other non-cold start-ups would be in the range of 30 to 40 lbs of NOx per event and there are some rare events

⁴ May 2, 2007, telephone conversation with Thomas Karastamatis - Siemens Power System Sales

when the start-up emissions would exceed the 40 lbs of NOx per start⁵. Thus for most of the year the project would be either in a hot start-up event, normal operation with the SCR fully operational, shutdown event or not operating. The ERCs provide 424 lbs of NOx per day per turbine (848 lbs/day divided by two turbines). On a daily basis with about 16 hours of normal operation, the project NOx daily emissions would be 259 lbs per turbine, which leaves about 165 lbs of NOx for start-up and shutdown event emissions⁶. Thus for most days of the year, assuming typical shutdown emissions of 40 lbs of NOx per event, the remaining 125 lbs of NOx per day can be dedicated to one hot start-up event. During these days, the project owner proposed ERCs would adequately mitigate the project's probable NOx emission liability. To ensure proper mitigation during other periods, the project owner agreed to conditions that restricted the facility maximum daily emissions to 1,225 lbs per day during the ozone season (between June 1 and September 30), and will put aside additional ERCs to mitigate any NOx emissions in excess of 848 lbs/day if that happened. Thus on any one day, the project emissions would be fully mitigated with ERCs.

To facilitate the project owner concerns about the cost of redesigning the project, staff has developed and recommends the adoption of Conditions of Certification **AQ-SC7** and **AQ-SC8** to address the project emissions and its mitigation.

Condition of Certification **AQ-SC7** would place a facility maximum NOx emission limit of 1,225 lbs/day during the June 1 through September 30 time period, and that any NOx emissions greater than 848 lbs/day shall be mitigated with ERCs.

Condition of Certification **AQ-SC8** places a NOx emission limit of 125 lbs for each hot/warm start-up event per combustion turbine and 40 lbs for each shutdown event per combustion turbine.

Ozone Precursors: POC

Similar to the project NOx emissions, the project POC emissions also correlate strongly with the start-up and shutdown events. Staff estimated that the project potential POC emissions would be 42.5 tons per year (see **AIR QUALITY Table 2**), for which the project owner proposed to mitigate with 28.5 tons of ERCs (CH2MHILL 2007a). On a daily basis, the project potential POC emissions can be as high as 431 lbs (worst case), while the reasonable maximum daily⁷ POC emissions are approximately 207 lbs/day (see **AIR QUALITY Appendix 1**). The proposed POC ERCs, on an average daily basis, would be equivalent to 157 lbs⁸, thus the proposed ERCs are not enough to adequately mitigate the project's potential POC contribution to atmospheric ozone.

Similar to NOx emissions, the Fast-Start technology would be expected to reduce the combustion turbine start-up POC emissions from 96 lbs to 21 lbs per cold start-up event, and from 48 lbs to 32 lbs for a hot or warm start-up event. Staff estimated that

⁵ June 1, 2007, telephone conversation with Barbara McBride - Calpine

⁶ 424 lbs/day ERC - 259 lbs/day (normal operation emissions) = 165 lbs/day for start up and shut down emissions.

⁷ Based on one hot start-up, 14 hours of normal operation and one shutdown for each combustion turbine/HRSG unit.

⁸ (28.7 tons per year x 2000 lbs/ton) / 365 days/year = 157 lbs/day

with the Fast-Start technology, the project's POC emissions would be 223 lbs/day for the maximum (worst case) potential and approximately 163 lbs/day for the most probable (reasonable) case. The provided POC ERCs could be adequate to mitigate the project's POC contribution to the atmospheric ozone.

Alternatively, staff believes that restricting the period of cold start-up, combustor tuning activities similar to the aforementioned NOx emissions would also reduce the facility POC emission liability to the point that the project owner's provided ERCs would adequately mitigate both the POC and NOx emissions from the project. Staff recommends the adoption of Conditions of Certification **AQ-SC7** to **AQ-SC9**.

Ozone Precursors: Simultaneous Start of Both Turbines

The project owner requested the deletion of existing Condition of Certification **AQ-22** in the Decision to enable them to simultaneously start both combustion turbine/HRSG units. The project owner believes that because the submitted air dispersion modeling shows that the NOx emissions from simultaneous start-up of both combustion turbine/HRSG units would not cause a violation of the ambient air quality standard for NO₂, such start-up scenarios should be allowed (CH2MHILL 2007a).

Even though the modeling shows that the NO₂ standard is not violated during the simultaneous start-up of both combustion turbine/HRSG units, the project owner has not provided evidence or modeling that shows that putting such a large quantity of NOx and POC emissions from a start-up (960 lbs of NOx and 192 lbs of POC for simultaneous cold start-up of both combustion turbines) would not adversely affect the 1-hour and 8-hour ozone air quality standards, which are violated on a regular basis. Again, if the facility is intended to operate as a load-following facility, then using combustion turbines with the Fast-Start technology can significantly reduce emissions.⁹ In short, staff cannot recommend the deletion of simultaneous start of both turbines without the facility using Fast-Start technology or its equivalent to reduce start-up times and emissions. This requirement is incorporated into Conditions of Certification **AQ-SC9** and **AQ-SC10**.

SOx

The project owner will provide 12.2 tons of SOx ERCs from banking certificate number 989 for emission reductions from the Potrero facility in San Francisco to mitigate the project's SOx emissions. Staff has shown the amount in **AIR QUALITY Table 4** and incorporated the amount of SOx ERCs to mitigate the project's SOx emission impacts into Condition of Certification **AQ-SC11**.

PM10/PM2.5

The project owner stated that because the project is not required by the District to provide ERCs to mitigate its PM10 emissions, they do not have to mitigate the annual emissions liability. They proposed to mitigate the project's PM10 emissions during the times of the year when the area experiences violation of the PM10 standards, which is during the fall and winter times, or about half a year. According to this logic, the project

⁹ This would facilitate staff's recommendation that the facility should be designed and built with the Siemens-Westinghouse Fast-Start technology (mentioned above) to minimize unnecessary emissions to the atmosphere.

owner has proposed to mitigate half of the project annual limits of 86.8 tons with only 43.4 tons of wintertime PM10 emission reductions (CH2MHILL 2007a).

The project owner proposed to mitigate the wintertime PM10 emissions through a wood stove/fireplace improvement program (RC2002a). The proposed program would be open to any Hayward resident who wished to participate on a voluntary basis. Each participant could replace or retrofit their existing wood stove or fireplace with a natural gas-fired unit. The rebate or incentive would be at least \$300 and could be used to either replace the existing wood stove with a modern stove with improved combustion and emission controls, or retrofit the existing fireplace with an insert or artificial gas log. Staff estimates that to mitigate the RCEC wintertime 43.4 tons of PM10 emissions, the project owner needs to have 933 Hayward participants that currently own a wood stove (at 93 lbs PM10/unit), or 8,346 participants who own a fireplace (at 10.4 lbs PM10/unit), or a combination of the two as long as the total emission reductions achieve 43.4 tons of PM10.

Identical stove and fireplace replacement programs were implemented in the Bay Area with highly localized and uneven results; therefore, staff recommends the project owner develop a plan to implement the woodstove/fireplace replacement program as the project mitigation measure. This plan must be submitted to the Compliance Project Manager (CPM) for approval and must incorporate specific milestones into the program to track its progress. Staff recommends that milestones include: 15 percent of the tons per year at six months, 30 percent of the tons per year at nine months, 50 percent of the tons per year at one year, 80 percent of the tons per year at 18 months, and a completion milestone, in tons per year for the program at the end of year two, which would be approximately coincident with the completion of construction and initiation of commissioning activities. The mitigation plan and its specific milestones are specified in staff recommended Condition of Certification **AQ-SC12**.

Additionally, staff believes that gas logs and fireplace inserts are not the most efficient means to heat homes. Thus, even though these gas logs offer the necessary PM10 emission reductions, they represent a waste of non-renewable resources and a potential ongoing cost to the user. This is because much of the heat generated in these devices is lost through the chimney. Staff recommends an optional element be added to the woodstove and fireplace replacement program that allows the participant to use the "offered rebate" toward improvement or replacement of the participant's natural gas or electric central heating units.

Staff also recommends adoption of a backstop mitigation plan should the woodstove/fireplace improvement program not work or does not meet the milestones specified in **AQ-SC13**. Based on input from the project owner (CH2MHILL 2007a), in case the woodstove/fireplace improvement program fails to achieve the PM10 reductions, SOx ERCs would be used to mitigate the project's PM10 emission contribution to the atmospheric PM10. The project owner provided an analysis¹⁰ of the

¹⁰ The analysis assumed equilibrium exists between sulfur compounds and sulfur based particulate matter in the area ambient air. Therefore, by examining the measured ambient concentrations of PM10, sulfur dioxide, and sulfate-based particulate matter, one can derive a ratio that can be used as a basis to determine the appropriate interpollutant trading ratio for SOx to PM10.

ambient air quality data collected from the nearest air quality monitoring station (Concord, CA) as well as incomplete ambient air quality data collected in the Fremont, Richmond and San Jose areas. According to this analysis of atmospheric inventories, the SOx for PM10 inter-pollutant trading ratio can range from 1.5 (in San Jose) to 7.24 (in Fremont) pounds of SOx for every pound of PM10 emissions. The project owner believes that the average of 1.5 and 7.24, which is approximately 3 to 1, should be used.

Staff does not agree with the project owner's analysis, as the ratios were determined with only one complete data set from the Concord monitoring station and the rest of the data used in the analysis were, at best, extrapolated data. Staff attempted to duplicate the submitted analysis with complete ambient air quality data collected from the Concord, San Pablo, and San Francisco areas, which staff believes better represent the overall air pollution levels and chemical equilibriums for the area surrounding the project site. Using these ambient air quality data, staff calculated that the inter-pollutant trading ratio of SOx for PM10 can range from 4.66 to 5.91, or 5.3 to 1 on average.

Based on staff's analysis, staff recommends that if the project owner wants to use the SOx for PM10 interpollutant trading to mitigate the project's 86.8 tons of PM10 per year with SOx ERCs, the necessary SOx credits would total 460 tons of SOx per year¹¹. Note that the District issues ERCs on an annual basis, and would not be able to separate out the winter season portion of annual ERCs. Therefore, to achieve a PM10 emission reduction, in pounds per day that matches the project's potential to emit in pound per day, the owner would need to submit ERCs that mitigate the annual project PM10 emissions. This requirement is shown in **AIR QUALITY Table 4** and incorporated into Condition of Certification **AQ-SC13**.

In summary, staff tabulated the project annual emission limits and the proposed offset mitigations, in the form of ERCs, or woodstove/fireplace improvement program, in **AIR QUALITY Table 4**. The project owner has purchased ERCs for NOx, POC and SO₂, in the form of District issued banking certificates, from sources of offsets located in the San Francisco and Hercules areas to mitigate the project's new emissions. The project owner proposes to initiate a woodstove/fireplace improvement program to mitigate the project's PM10 emissions. If these not work, they will use ERCs of SO₂ to trade for the project's PM10 emissions. Staff recommends a "5.3 to 1" ratio, i.e., for every pound of new PM10 emissions from the proposed facility, 5.3 pounds of SO₂ are purchased to offset such increase.

GREENHOUSE GASES

The generation of electricity can produce air emissions known as greenhouse gases (GHGs) in addition to the criteria air pollutants. GHGs are known to contribute to the warming of the earth's atmosphere. These include primarily carbon dioxide, nitrous oxide (N₂O, not NO or NO₂, which are commonly know as NOx or oxides of nitrogen), and methane (unburned natural gas). Also included are sulfur hexafluoride (SF₆) from

¹¹ 86.4 TPY of PM10 emissions from the project times the interpollutant trading ratio of 5.29 = 460 TPY of SOx that should be surrendered.

transformers, and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration chillers.

**AIR QUALITY Table 4
Annual NOx, POC, SOx and PM10 Emissions and Offsets**

| Pollutant | Emission Limits (tpy) | Offset Ratio | ERC Mitigation (tpy) | Proposed Offsets (tpy) |
|-------------------|-----------------------|---------------------|----------------------|---|
| NOx | 134.6 | 1.15:1 ¹ | 154.8 ² | 53.11 tons (Cert. #855-PG&E-San Francisco) 49.86 tons (Cert. #815-Pacific Refining-Hercules) 51.83 tons (Cert. #815-Pacific Refining-Hercules) |
| POC | 28.5 | 1:1 ¹ | 28.5 ² | 28.5 tons (Cert. #815-Pacific Refining-Hercules) |
| SOx | 12.2 | 1:1 | 12.2 | 12.2 tons (Cert. #989 -Potrero-San Francisco) |
| PM10 | 86.8 | — | 43.3 | 43.4 “wintertime” tons (if woodstove and fireplace replacement program is successfully implemented) |
| OR PM10 | 86.8 | 5.3:1 ³ | 460.0 | 460 tons (if SO2 ERCs are use as interpollutant credit of PM10 precursors) |

- Notes:**
1. Offset ratio as required by the District.
 2. Offset mitigation as required by the District.
 3. Staff recommended SO₂ for PM10 inter-pollutant offset ratio (See AIR QUALITY Appendix 2).

Climate change from rising temperatures represents a risk to California’s economy, public health, and environment (CEC 2003). In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p.5). In 2003, the Energy Commission recommended that the state should require reporting of GHG emissions as a condition of state licensing of new electric generating facilities (CEC 2003, p. 42). Such reporting would be done in accordance with reporting protocols currently in place or that will be adopted with the implementation of new laws.

The Intergovernmental Panel on Climate Change (IPCC), an international scientific body, has developed standard reporting protocols and methodologies for governments and agencies to follow in calculations for GHG inventories. The IPCC-approved methodology for calculating GHG emissions in an inventory is particular to the type of fossil fuel burned. In their *Revised 1996 Guidelines for National Greenhouse Gas Inventories: Reference Manual*, the IPCC established the factors for oxidation, fuel-based emissions, and global warming potential.

The California Global Warming Solutions Act of 2006 (AB32) requires the California Air Resources Board (ARB) to adopt a statewide GHG emissions limit equivalent to the statewide GHG emissions levels in 1990 to be achieved by 2020. To achieve this, ARB

has a mandate to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

The ARB is expected to adopt early action GHG reduction measures by July 2007 and establish a statewide emissions cap by January 2008. By January 1, 2008, ARB is scheduled to adopt regulations requiring mandatory GHG emissions reporting and define the statewide GHG emissions cap for 2020. ARB would adopt a plan by January 1, 2009 that would indicate how emission reductions would be achieved from significant sources of GHGs via regulations, market mechanisms, and other actions. Then, during 2009, ARB staff would draft rule language to implement its plan and hold public workshops on each measure including market mechanisms (ARB, 2006c). Strategies that the state might pursue for managing GHG emissions in California are identified in the California Climate Action Team's Report to the Governor (CalEPA, 2006). Some strategies focus on reducing consumption of petroleum across all areas of the California economy. Improvements in transportation energy efficiency (fuel economy) and land use planning and alternatives to petroleum-based fuels are slated to provide substantial reductions by 2020 (CalEPA, 2006).

The Electricity Greenhouse Gas Emission Standards Act (SB1368¹²) was also enacted in 2006, requiring base load generation resources or contracts be subject to a GHG or Environmental Performance Standard. At its January 25, 2007 meeting, the California Public Utilities Commission (CPUC) adopted an Emissions Performance Standard for the state's Investor Owned Utilities of 1,100 pounds (or 0.5 metric tons) CO₂ per megawatt-hour (MWh). The Emissions Performance Standard applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California.¹³ A similar performance standard is undergoing rulemaking by the Energy Commission for the Publicly Owned Utilities, and it should be adopted by June 30, 2007.¹⁴

Staff recommends Condition of Certification **AQ-SC14**, which requires the project owner to report the quantities of relevant GHGs emitted as a result of electric power production. Staff believes that **AQ-SC14**, with the reporting GHG emissions, will enable the project to be consistent with the regulations and policies described above. The GHG emissions to be reported in **AQ-SC14**, are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, HFCs and PFCs emissions that are directly associated with the production and transmission of electric power.

CUMULATIVE IMPACTS AND MITIGATION

The project owner conducted cumulative modeling of other potential sources, including the proposed Eastshore Energy Center (EEC) (RC2007a and RC2007b) that might be built or operated near the RCEC. The cumulative modeling did not identify significant impacts. However, the modeling did not, and could not, model ozone impacts. Since both the RCEC and the EEC are intended, and under contract to, operate as load-

¹² Public Utilities Code § 8340 et seq.

¹³ See Rule at

¹⁴ See CEC Docket # 06-OIR-1, <http://www.energy.ca.gov/ghgstandards/documents>.

following or peaking units, frequent start-ups and simultaneous operation during the summer peak demand and ozone season may result in unidentified and unmitigated ozone impacts. It is contingent on the project owner to provide ERCs for NO_x, POC, SO_x and PM₁₀/PM_{2.5} and operate the facility in compliance with staff recommended conditions of certification to reduce start-up and daily emissions and potential ozone impacts.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff received an oral comment from Mr. Mike Sweeney, the Mayor of the City of Hayward, regarding the project. Mr. Sweeney, at the December 15, 2006 Informational Hearing, expressed concerns over the impacts of the project's emissions and net air quality benefits of the emission mitigations on the local air quality. Staff believes that with incorporation of the recommended conditions of certification, concerns about the project's impacts on local air quality will be addressed.

CONCLUSIONS

- The project would comply with applicable District Rules and Regulations, including New Source Review requirements.
- The project would not cause new violations of any NO₂, SO₂, or CO ambient air quality standards, and therefore, the project direct NO_x, SO_x and CO emission impacts are not significant.
- Without proper mitigation, the project NO_x and POC emissions would potentially contribute to existing violations of the state 1-hour and the federal 8-hour ozone air quality standards. Staff has determined that by restricting the period and the emissions of the facility start up events (**AQ-SC7** and **AQ-SC8**), or the incorporation of technologies specifically designed to reduce start-up times (**AQ-SC10**), restrictions of simultaneous start up (**AQ-SC9**), and surrender of ERCs in (**AQ-SC11**) would mitigate the project's ozone impact to a level that is less than significant.
- The project PM₁₀ emissions and PM₁₀ precursor emissions of SO_x would contribute to the existing violations of the state 24-hour PM₁₀ air quality standard. However, staff has determined that mitigation, in the form of ERCs (**AQ-SC11**), and the successful implantation of the woodstove/fireplace improvement program (**AQ-SC12**) or the alternative PM₁₀ or SO_x for PM₁₀ ERCs (**AQ-SC13**) would mitigate the project's PM₁₀ impacts to a level that is less than significant.
- The project's construction impacts would contribute to violations of the state 24-hour PM₁₀ standard. However, staff has determined that the implementation of Conditions of Certification **AQ-SC1** to **AQ-SC5** would mitigate the project PM₁₀ emissions contribution to a level that is less than significant.
- Staff recommends the addition of Condition of Certification **AQ-SC6** to enhance staff's ability to track the construction and operation of the project.

- Staff recommends the addition of Condition of Certification **AQ-SC14** to require GHG reporting.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below replace all the Air Quality Conditions of Certification contained in the original Decision (CEC 2002b). This includes staff's recommendation to replace Air Quality Conditions of Certification **AQ-C1** through **AQ-C4** pertaining to construction, with **AQ-SC1** through **AQ-SC14** below. The District issued an amended PDOC and the PDOC's conditions are included below as Air Quality Conditions of Certification **AQ-1** through **AQ-50**. Strikeout is used to indicate deleted language and underline for new language.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with **AQ-SC3, AQ-SC4 and AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the Compliance Project Manager (CPM).

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with **AQ-SC3, AQ-SC4 and AQ-SC5.**

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The District will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report (MCR) that demonstrates compliance with the following mitigation measures for the purposes of preventing all fugitive dust plumes from leaving the Project. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

- a) All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust**

mitigation objectives of AQ-SC4. The frequency of watering can be reduced or eliminated during periods of precipitation.

- b) No vehicle shall exceed 10 miles per hour within the construction site.
- c) The construction site entrances shall be posted with visible speed limit signs.
- d) All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.
- e) Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.
- f) All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.
- g) All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the District.
- h) Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.
- i) All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.
- j) At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on the public roadways.
- k) All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.
- l) All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.
- m) Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The project owner shall provide to the CPM a MCR to include:

- (1) a summary of all actions taken to maintain compliance with this condition;
- (2) copies of any complaints filed with the District in relation to project construction; and

- (3) any other documentation deemed necessary by the District and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (1) off the project site or (2) 200 feet beyond the centerline of the construction of linear facilities or (3) within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the District any directive from the AQCMM or Delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the District before that time.

Verification: The project owner shall provide to the CPM a MCR to include:

- (1) a summary of all actions taken to maintain compliance with this condition;
(2) copies of any complaints filed with the District in relation to project construction; and
(3) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM in the MCR, a construction mitigation report that demonstrates compliance with the following mitigation measures for the purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

- a) All diesel-fueled engines used in the construction of the facility shall be fueled only with ultra-low sulfur diesel, which contains no more than 15 ppm sulfur.
- b) All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.
- c) All construction diesel engines, which have a rating of 100 hp or more, shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, section 2423(b)(1) unless certified by the on-site AQCMM that such engine is not available for a particular item of equipment. In the event a Tier 2 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a Tier 1 engine. In the event a Tier 1 engine is not available for any off-road engine larger than 100 hp, that engine shall be equipped with a catalyzed diesel particulate filter (soot filter), unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is "not practical" if, among other reasons:
- (1) There is no available soot filter that has been certified by either the California Air Resources Board (ARB) or U.S. Environmental Protection Agency (EPA) for the engine in question; or
 - (2) The construction equipment is intended to be on-site for ten (10) days or less.
 - (3) The CPM may grant relief from this requirement if the AQCMM can demonstrate that they have made a good faith effort to comply with this requirement and that compliance is not possible.
- d) The use of a soot filter may be terminated immediately if one of the following conditions exists, provided that the CPM is informed within ten (10) working days of the termination:
- (1) The use of the soot filter is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or reduced power output due to an excessive increase in backpressure.
 - (2) The soot filter is causing or is reasonably expected to cause significant engine damage.
 - (3) The soot filter is causing or is reasonably expected to cause a significant risk to workers or the public.
 - (4) Any other seriously detrimental cause which has the approval of the CPM prior to the termination being implemented.
- e) All heavy earthmoving equipment and heavy duty construction related trucks with engines meeting the requirements of (c) above shall be properly

maintained and the engines tuned to the engine manufacturer's specifications.

- f) All diesel heavy construction equipment shall not remain running at idle for more than five minutes, to the extent practical.

Verification: The project owner shall include in the MCR:

- (1) a summary of all actions taken to maintain compliance with this condition,
- (2) copies of all diesel fuel purchase records,
- (3) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained, and
- (4) any other documentation deemed necessary by the CPM and AQCM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall provide the CPM copies of all District issued Authority-to-Construct (ATC) and Permit-to-Operate (PTO) for the facility.

The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any ATC, PTO, and any proposed air permit modification to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC7 The facility's emissions shall not exceed 1,225 lbs of NO_x per day and 157 lbs of POC during the June 1 to September 30 periods. In addition, NO_x emissions in excess of 848 lbs per calendar day shall be mitigated through the surrender of emission reduction credits (ERCs). The amount of credits to be surrendered shall be the difference between 848 lbs per day and the actual daily emissions.

Verification: The project owner shall submit to the District and the CPM the quarterly and annual compliance reports as required by AQ-19. Violations of this condition shall require the project owner to apply to the CPM for an immediate amendment to the project.

AQ-SC8 Turbine hot/warm start-up NO_x emissions shall not exceed 125 pounds per start-up event.

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit

condition. Violations of this condition shall require the project owner to apply to the CPM for an immediate amendment to the project.

AQ-SC9 The project owner shall not operate both gas turbines (S-1 and S-3) simultaneously in start-up mode.

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit condition. Violations of this condition shall require the project owner to apply to the CPM for an immediate amendment to the project.

AQ-SC10 In lieu of complying with AQ-SC7, AQ-SC8, and AQ-SC9, the project's combustion turbine/HRSG units shall be designed and built with equipment and control systems to minimize start-up times and emissions. These could include the Fast-Start technology with an integrated control system and a once-through Benson boiler design, appropriate system configuration and equipment to facilitate operating chemistry during starting sequences, and an auxiliary boiler.

Verification: Ninety (90) days prior to start of construction, the project owner shall submit to the CPM, for approval, the type of turbine/HRSG design(s) and manufacturer's information that start-up time of the turbine/HRSG can be reduce to no more than 2 hours.

AQ-SC11 The project owner shall surrender 12.2 tons per year of SO_x or SO_x-equivalent emission reduction credits (ERCs) from certificate 989, 28.5 tons per year of POC ERCs, and 154.8 tons per year of NO_x, or an equivalent combination of NO_x and POC ERCs from certificates 815 and 855, prior to start of construction of the project.

Verification: The project owner shall submit to the CPM a copy of all ERCs to be surrendered to the District at least 30 days prior to start construction.

AQ-SC12 A fireplace retrofit/woodstove replacement program shall be made available to all Hayward residents on a first-come, first-serve basis to finance a voluntary woodstove replacement/fireplace retrofit. The program shall provide a minimum of 43.4 tons of PM₁₀ ERCs per year. Each resident participating in the retrofit/replacement program would agree to replace their existing woodstove or fireplace with a natural gas-fired unit, or to permanently close the fireplace or woodstove chimney and apply the rebate toward the improvement or replacement of their homes' existing central heating and air conditioning unit. Quarterly status reports on the program meeting the following milestones shall be submitted to the CPM,

- a. achieving 6.5 tons per year of PM₁₀ six (6) months after start of construction.
- b. achieving 13.0 tons per year of PM₁₀ nine (9) months after start of construction.
- c. achieving 21.7 tons per year of PM₁₀ twelve (12) months after start of construction.

- d. achieving 34.7 tons per year of PM10 eighteen (18) months after start of construction.
- e. achieving 43.4 tons per year of PM10 twenty four (24) months after start of construction.

Verification: At least ninety (90) days from start of construction, the project owner shall submit to the CPM a plan detailing the fireplace/woodstove replacement program for approval. The plan shall include, at the minimum, the description of the program, the amount of rebate, the person (or agency) who oversees the program implementation, the responsible person who reports to the CPM on the progress of the program implementation, the target milestones, and procedures to be followed if the target milestones have not been met. The project owner shall submit documentation to show compliance with this condition in the quarterly and annual reports as required in AQ-20.

AQ-SC13 In lieu of compliance with AQ-SC12, or if complete compliance with AQ-SC12 cannot be achieved by the milestones, the project owner shall provide the unmet portion of the 86.8 TPY of PM10 required, either as PM10 or SOx ERCs, acquired in the areas surrounding Oakland, Hayward, Fremont, San Jose and San Francisco areas to provide an annual equivalent of 86.8 TPY of PM10 or PM10 equivalent at the SOx for PM10 interpollutant trading ratio of 5.3 to 1.

Verification: The project owner shall submit to the CPM a list of PM10 and/or SOx ERCs to be surrendered to the District at least 60 days prior to initial startup.

AQ-SC14 Until the California Global Warming Solutions Act of 2006 (AB32) is implemented, the project owner shall either participate in a climate action registry approved by the CPM, or report on a annual basis to the CPM the quantity of greenhouse gases (GHG) emitted as a direct result of facility electricity production.

The project owner shall maintain a record of fuels types and carbon content used on-site for the purpose of power production. These fuels shall include but are not limited to each fuel type burned: (1) in combustion turbines, (2) HRSGs (if applicable) or auxiliary boiler (if applicable), (3) internal combustion engines, (4) flares, and/or (5) for the purpose of startup, shutdown, operation or emission controls.

The project owner may perform annual source tests of CO₂ and CH₄ emissions from the exhaust stacks while firing the facility's primary fuel, using the following test methods or other test methods as approved by the CPM. The project owner shall produce fuel-based emission factors in units of lbs CO₂ equivalent per mmBtu of fuel burned from the annual source tests. If a secondary fuel is approved for the facility, the project owner may also perform these source tests while firing the secondary fuel.

| Pollutant | Test Method |
|------------------|---|
| CO ₂ | EPA Method 3A |
| CH ₄ | EPA Method 18 (POC measured as CH ₄) |

As an alternative to performing annual source tests, the project owner may use the Intergovernmental Panel on Climate Change (IPCC) Methodologies for Estimating Greenhouse Gas Emissions (MEGGE). If MEGGE is chosen, the project owner shall calculate the CO₂, CH₄ and N₂O emissions using the appropriate fuel-based carbon content coefficient (for CO₂) and the appropriate fuel-based emission factors (for CH₄ and N₂O).

The project owner shall convert the N₂O and CH₄ emissions into CO₂ equivalent emissions using the current IPCC Global Warming Potentials (GWP). The project owner shall maintain a record of all SF₆ that is used for replenishing on-site transformers. At the end of each reporting period, the project owner shall total the mass of SF₆ used and convert that to a CO₂ equivalent emission using the IPCC GWP for SF₆. The project owner shall maintain a record of all PFCs and HFCs that are used for replenishing on-site refrigeration and chillers directly related to electricity production. At the end of each reporting period, the project owner shall total the mass of PFCs and HFCs used and not recycled and convert that to a CO₂ equivalent emission using the IPCC GWP.

On an annual basis, the project owner shall report the CO₂ and CO₂ equivalent emissions from the described emissions of CO₂, N₂O, CH₄, SF₆, PFCs, and HFCs.

Verification: The project annual GHG emissions shall be reported, as a CO₂ equivalent, by the project owner to a climate action registry approved by the CPM, or to the CPM as part of the fourth Quarterly or the annual Air Quality Report, until such time that GHG reporting requirements are adopted and in force for the project as part of the California Global Warming Solutions Act of 2006.

DISTRICT CONDITIONS OF CERTIFICATIONS

Permit Conditions

(A) Definitions:

| | |
|--|--|
| <u>Clock Hour:</u> | <u>Any continuous 60-minute period beginning on the hour</u> |
| <u>Calendar Day:</u> | <u>Any continuous 24-hour period beginning at 12:00 AM or 0000 hours</u> |
| <u>Year:</u> | <u>Any consecutive twelve-month period of time</u> |
| <u>Heat Input:</u> | <u>All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf</u> |
| <u>Rolling 3-hour period:</u> | <u>Any consecutive three-hour period, not including start-up or shutdown periods</u> |
| <u>Firing Hours:</u> | <u>Period of time during which fuel is flowing to a unit, measured in minutes</u> |
| <u>MM BTU:</u> | <u>million British thermal units</u> |
| <u>Gas Turbine Warm and Hot Start-up Mode:</u> | <u>The lesser of the first 180 minutes of continuous fuel flow to the gas turbine after fuel flow is initiated or the period of time from gas turbine fuel flow initiation until the gas turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of Conditions of Certification AQ-20(b) and 20(d)</u> |
| <u>Gas Turbine Cold Start-up Mode:</u> | <u>The lesser of the first 360 minutes of continuous fuel flow to the gas turbine after fuel flow is initiated or the period of time from gas turbine fuel flow initiation until the gas turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of Conditions of Certification AQ-20(b) and 20(d)</u> |
| <u>Gas Turbine Shutdown Mode:</u> | <u>The lesser of the 30 minute period immediately prior to the termination of fuel flow to the gas turbine or the period of time from non-compliance with any requirement listed in Conditions of Certification AQ 20(b) through 20(d) until termination of fuel flow to the gas turbine</u> |
| <u>Gas Turbine Combustor: Tuning Mode</u> | <u>The period of time, not to exceed 360 minutes, in which testing, adjustment, tuning, and calibration operations are performed, as recommended by the gas turbine manufacturer, to insure safe and reliable steady-state operation, and to minimize NO_x and CO emissions. The SCR and oxidation catalyst are not operating during the tuning operation.</u> |
| <u>Gas Turbine Cold Start-up:</u> | <u>A gas turbine start-up that occurs more than 72 hours after a gas turbine shutdown</u> |

| | |
|--|---|
| <u>Gas Turbine Hot Start-up:</u> | <u>A gas turbine start-up that occurs within 8 hours of a gas turbine shutdown</u> |
| <u>Gas Turbine Warm Start-up:</u> | <u>A gas turbine start-up that occurs between 8 hours and 72 hours of a gas turbine shutdown</u> |
| <u>Specified PAHs:</u> | <u>The polycyclic aromatic hydrocarbons listed below shall be considered to be Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds</u> <u>Benzo[a]anthracene</u> <u>Benzo[b]fluoranthene</u> <u>Benzo[k]fluoranthene</u> <u>Benzo[a]pyrene</u> <u>Dibenz[a,h]anthracene</u> <u>Indeno[1,2,3-cd]pyrene</u> |
| <u>Corrected Concentration:</u> | <u>The concentration of any pollutant (generally NO_x, CO, or NH₃) corrected to a standard stack gas oxygen concentration. For emission points P-1 (combined exhaust of S-1 gas turbine and S-3 HRSG duct burners), P-2 (combined exhaust of S-2 gas turbine and S-4 HRSG duct burners), the standard stack gas oxygen concentration is 15% O₂ by volume on a dry basis</u> |
| <u>Commissioning Activities:</u> | <u>All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the RCEC construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems during the commissioning period</u> |
| <u>Commissioning Period:</u> | <u>The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales to the power exchange.</u> |
| <u>Precursor Organic Compounds (POCs):</u> | <u>Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate</u> |
| <u>CPM:</u> | <u>California Energy Commission Compliance Program Manager</u> |
| <u>RCEC:</u> | <u>Russell City Energy Center</u> |

(B) Applicability:

Conditions of Certification AQ-1 through AQ-11 shall only apply during the commissioning period as defined above. Unless otherwise indicated, Conditions of

Certification AQ-12 through AQ-49 shall apply after the commissioning period has ended.

The RCEC will consist of the following permitted equipment:

S-1 Combustion Turbine Generator (CTG) #1, Westinghouse 501F, 2,038.6 MMBtu/hr maximum rated capacity, natural gas fired only; abated by A-1 Selective Catalytic Reduction System (SCR) and A-2 Oxidation Catalyst

S-2 Heat Recovery Steam Generator (HRSG) #1, with Duct Burner Supplemental Firing System, 200 MMBtu/hr maximum rated capacity; Abated by A-1 Selective Catalytic Reduction (SCR) System and A-2 Oxidation Catalyst

S-3 Combustion Turbine Generator (CTG) #2, Westinghouse 501F, 2,038.6 MMBtu/hr maximum rated capacity, natural gas fired only; abated by A-3 Selective Catalytic Reduction System (SCR) and A-4 Oxidation Catalyst

S-4 Heat Recovery Steam Generator (HRSG) #2, with Duct Burner Supplemental Firing System, 200 MMBtu/hr maximum rated capacity; Abated by A-3 Selective Catalytic Reduction (SCR) System and A-4 Oxidation Catalyst

S-5 Cooling Tower, 9-Cell, 141,352 gallons per minute, with efficiency drift eliminators, make and model to be determined.

S-6 Fire Pump Diesel Engine, Clarke JW6H-UF40, 300 hp, 2.02 MMBtu/hr rated heat input.

CONDITIONS FOR THE COMMISSIONING PERIOD

AQ-1. The owner/operator of the RCEC shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 gas turbines and S-2 & S-4 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period.

Verification: The project owner shall submit a Monthly Compliance Report (MCR) to the CPM specifying how this condition is being complied with.

AQ-2. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune the S-1 & S-3 gas turbines combustors and S-2 & S-4 HRSGs duct burners to minimize the emissions of carbon monoxide and nitrogen oxides.

Verification: The project owner shall submit a MCR to the CPM specifying how this condition is being complied with.

AQ-3. At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, owner/operator shall install, adjust, and operate the A-2 & A-4 Oxidation Catalysts and A-1 & A-3 SCR Systems, to minimize the emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 gas turbines and S-2 & S-4 HRSGs.

Verification: The project owner shall submit a MCR to the CPM specifying how this condition is being complied with.

AQ-4. The owner/operator of the RCEC shall submit a plan to the District Engineering Division and the CPM at least four weeks prior to first firing of S-1 & S-3 gas turbines describing the procedures to be followed during the commissioning of the gas turbines, HRSGs, and steam turbines. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_x combustors, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the gas turbines (S-1 & S-3) and HRSGs (S-2 & S-4) without abatement by their respective oxidation catalysts and/or SCR Systems. The owner/operator shall not fire any of the gas turbines (S-1 or S-3) sooner than 28 days after the District receives the commissioning plan.

Verification: The project owner shall submit a MCR to the CPM specifying how this condition is being complied with.

AQ-5. During the commissioning period, the owner/operator of the RCEC shall demonstrate compliance with **AQ-8, AQ-9, AQ-10 and AQ-11**, through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

firing hours
fuel flow rates
stack gas nitrogen oxide emission concentrations,
stack gas carbon monoxide emission concentrations
stack gas oxygen concentrations.

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the gas turbines (S-1 & S-3), HRSGs (S-2 & S-4). The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. The owner/operator shall retain records on site for at least five (5) years from the date of entry and make such records available to District personnel upon request.

Verification: The project owner shall submit a MCR report to the CPM specifying how this condition is being complied with.

AQ-6. The owner/operator shall install, calibrate, and operate the District-approved continuous monitors specified in **AQ-5** prior to first firing of the gas turbines (S-1 & S-3) and HRSGs (S-2 & S-4). After first firing of the turbines, the owner/operator shall adjust the detection range of these continuous emission monitors as necessary to accurately measure the resulting range of CO and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

Verification: The project owner shall submit a MCR to the CPM specifying how this condition is being complied with. In addition, the project owner shall provide evidence of the District's approval of the emission monitoring system to the CPM prior to first firing of the gas turbines.

AQ-7. The owner/operator shall not fire the S-1 gas turbine and S-2 HRSG without abatement of nitrogen oxide emissions by A-1 SCR System and/or abatement of carbon monoxide emissions by A-2 Oxidation Catalyst for more than 300 hours during the commissioning period. Such operation of S-1 gas turbine and S-2 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and/or oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Engineering and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

Verification: The project owner shall submit a MCR to the CPM specifying how this condition is being complied with.

AQ-8. The owner/operator shall not fire the S-3 gas turbine and S-4 HRSG without abatement of nitrogen oxide emissions by A-3 SCR System and/or abatement of carbon monoxide emissions by A-4 Oxidation Catalyst for more than 300 hours during the commissioning period. Such operation of S-3 gas turbine and S-4 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and/or oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Engineering and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

Verification: The project owner shall submit a MCR to the CPM specifying how this condition is being complied with.

AQ-9. The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the gas turbines (S-1 & S-3), HRSGs (S-2 & S-4) and S-6 Fire Pump Diesel Engine during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in AQ-23.

Verification: The project owner shall submit a MCR to the CPM specifying how this condition is being complied with.

AQ-10. The owner/operator shall not operate the gas turbines (S-1 & S-3) and HRSGs (S-2 & S-4) in a manner such that the combined pollutant emissions from these sources will exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the gas turbines (S-1 & S-3).

| | | |
|---|---------------------------------------|------------------------------|
| <u>NO_x (as NO₂)</u> | <u>4,805 pounds per calendar day</u> | <u>400 pounds per hour</u> |
| <u>CO</u> | <u>20,000 pounds per calendar day</u> | <u>5,000 pounds per hour</u> |
| <u>POC (as CH₄)</u> | <u>495 pounds per calendar day</u> | |
| <u>PM10</u> | <u>432 pounds per calendar day</u> | |
| <u>SO₂</u> | <u>298 pounds per calendar day</u> | |

Verification: The project owner shall submit a MCR to the CPM specifying how this condition is being complied with.

AQ-11. No less than 45 days prior to the end of the Commissioning Period, the owner/operator shall conduct District and Energy Commission approved source tests using certified continuous emission monitors to determine compliance with the emission limitations specified in AQ-19. The source tests shall determine NO_x, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods and shall include at least one cold start, one warm start, and one hot start. Twenty (20) working days before the execution of the source tests, the owner/operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The District and the CPM will notify the owner/operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The owner/operator shall incorporate the District and CPM comments into the test plan. The owner/operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. The owner/operator shall submit the source test results to the District and the CPM within 60 days of the source testing date.

Verification: No later than 30 working days before the commencement of the source tests, the project owner shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this condition. The District and the CPM will notify the project owner of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The project owner shall incorporate the District and CPM comments into the test plan. The project owner shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within 60 days of the source testing date.

Conditions for the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4)

AQ-12. The owner/operator shall fire the gas turbines (S-1 & S-3) and HRSG duct burners (S-2 & S-4) exclusively on PUC-regulated natural gas with a maximum sulfur content of 1 grain per 100 standard cubic feet. To demonstrate compliance with this limit, the operator of S-1 through S-4 shall sample and analyze the gas from each supply source at least monthly to determine the sulfur content of the gas. PG&E monthly sulfur data may be used provided that such data can be demonstrated to be representative of the gas delivered to the RCEC. In the event that the average sulfur content exceeds 0.25 grain per 100 standard cubic feet, a reduced annual heat input rate may be utilized to calculate the maximum projected annual emissions. The reduced annual heat input rate shall be subject to District review and approval. (BACT for SO₂ and PM₁₀)

Verification: The project owner shall complete, on a monthly basis, a laboratory analysis showing the sulfur content of natural gas being burned at the facility. The sulfur analysis reports shall be incorporated into the quarterly compliance reports.

AQ-13. The owner/operator shall not operate the units such that the combined heat input rate to each power train consisting of a gas turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) exceeds 2,238.6 MM BTU (HHV) per hour. (PSD for NO_x)

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

AQ-14. The owner/operator shall not operate the units such that the combined heat input rate to each power train consisting of a gas turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) exceeds 53,726 MM BTU (HHV) per day. (PSD for PM₁₀)

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

AQ-15. The owner/operator shall not operate the units such that the combined cumulative heat input rate for the gas turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) exceeds 35,708,858 MM BTU (HHV) per year. (Offsets)

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

AQ-16. The owner/operator shall not fire the HRSG duct burners (S-2 & S-4) unless its associated gas turbine (S-1 & S-3, respectively) is in operation. (BACT for NO_x)

Verification: As part of the quarterly and annual compliance reports, the project owner shall include information on the date, time, and duration of any violation of this permit condition.

AQ-17. The owner/operator shall ensure that the S-1 gas turbine and S-2 HRSG are abated by the properly operated and properly maintained A-1 SCR system and A-2 oxidation catalyst system whenever fuel is combusted at those sources and the A-1 SCR catalyst bed has reached minimum operating temperature. (BACT for NO_x, POC and CO)

Verification: As part of the quarterly and annual compliance reports, the project owner shall provide information on any major problem in the operation of the oxidizing catalyst and SCR Systems for the gas turbines and HRSGs. The information shall include, at a minimum, the date and description of the problem and the steps taken to resolve the problem.

AQ-18. The owner/operator shall ensure that the S-3 gas turbine and S-4 HRSG are abated by the properly operated and properly maintained A-3 SCR System and A-4 oxidation catalyst system whenever fuel is combusted at those sources and the A-3 SCR catalyst bed has reached minimum operating temperature. (BACT for NO_x, POC and CO)

Verification: As part of the quarterly and annual compliance reports, the project owner shall provide information on any major problem in the operation of the oxidizing catalyst and SCR Systems for the gas turbines and HRSGs. The information shall include, at a minimum, the date and description of the problem and the steps taken to resolve the problem.

AQ-19. The owner/operator shall ensure that the gas turbines (S-1 & S-3) and HRSGs (S-2 & S-4) comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode. Requirements (a) through (h) do not apply during a gas turbine start-up, combustor tuning operation or shutdown. (BACT, PSD, and Regulation 2, Rule 5)

- (a) Nitrogen oxide mass emissions (calculated as NO₂) at P-1 (the combined exhaust point for S-1 gas turbine and S-2 HRSG after abatement by A-1 SCR System) shall not exceed 16.5 pounds per hour or 0.00735 lb/MM BTU (HHV) of natural gas fired. Nitrogen oxide mass emissions (calculated as NO₂) at P-2 (the combined exhaust point for S-3 gas turbine and S-4 HRSG after abatement by A-3 SCR System) shall not exceed 16.5 pounds per hour or 0.00735 lb/MM BTU (HHV) of natural gas fired
- (b) The nitrogen oxide emission concentration at emission points P-1 and P-2 each shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O₂, averaged over any 1-hour period. (BACT for NO_x)
- (c) Carbon monoxide mass emissions at P-1 and P-2 each shall not exceed 20 pounds per hour or 0.009 lb/MM BTU of natural gas fired, averaged over any rolling 3-hour period. (PSD for CO)
- (d) The carbon monoxide emission concentration at P-1 and P-2 each shall not exceed 4.0 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. (BACT for CO)
- (e) Ammonia (NH₃) emission concentrations at P-1 and P-2 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to A-2 and A-4 SCR Systems. The correlation between the gas turbine and HRSG heat input rates, A-2 and A-4 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with permit condition 30. (Regulation 2-5)
- (f) Precursor organic compound (POC) mass emissions (as CH₄) at P-1 and P-2 each shall not exceed 2.86 pounds per hour or 0.00128 lb/MM BTU of natural gas fired. (BACT)
- (g) Sulfur dioxide (SO₂) mass emissions at P-1 & P-2 each shall not exceed 1.55 pounds per hour or 0.0007 lb/MM BTU of natural gas fired. (BACT)
- (h) Particulate matter (PM₁₀) mass emissions at P-1 & P-2 each shall not exceed 8.64 pounds per hour or 0.0042 lb PM₁₀/MM BTU of natural gas fired when the HRSG duct burners are not in operation. Particulate matter (PM₁₀) mass emissions at P-1 & P-2 each shall not exceed 11.64 pounds per hour or

0.0052 lb PM10/MM BTU of natural gas fired when the HRSG duct burners are in operation. (BACT)

Verification: The project owner shall submit to the District and CPM, quarterly reports for the preceding calendar quarter within 30 days from the end of the quarter. The report for the fourth quarter can be an annual compliance summary for the preceding year. The quarterly and annual compliance summary reports shall contain the following information:

- (a) Operating parameters of emission control equipment, including but not limited to ammonia injection rate, NO_x emission rate and ammonia slip.
- (b) Total plant operation time (hours), number of startups, hours in cold startup, hours in warm startup, hours in hot startup, and hours in shutdown.
- (c) Date and time of the beginning and end of each startup and shutdown period.
- (d) Average plant operation schedule (hours per day, days per week, weeks per year).
- (e) All continuous emissions data reduced and reported in accordance with the District approved CEMS protocol.
- (f) Maximum hourly, maximum daily, total quarterly, and total calendar year emissions of NO_x, CO, PM10, POC and SO_x (including calculation protocol).
- (g) Fuel sulfur content (monthly laboratory analyses, monthly natural gas sulfur content reports from the natural gas supplier(s), or the results of a custom fuel monitoring schedule approved by the District.
- (h) A log of all excess emissions, including the information regarding malfunctions/breakdowns.
- (i) Any permanent changes made in the plant process or production, which would affect air pollutant emissions, and indicate when changes were made.
- (j) Any maintenance to any air pollutant control system (recorded on an as-performed basis).

In addition, this information shall be maintained on site for a minimum of five (5) years and shall be provided to District personnel on request.

AQ-20. The owner/operator shall ensure that the regulated air pollutant mass emission rates from each of the gas turbines (S-1 & S-3) during a start-up does not exceed the limits established below. (PSD)

| Pollutant | <u>Cold Start-Up Combustor Tuning</u> | <u>Hot Start-Up</u> | <u>Warm Start-Up</u> | <u>Shutdown</u> |
|--|--|----------------------------|-----------------------------|---------------------------|
| | <u>lb/start-up</u> | <u>lb/start-up</u> | <u>lb/start-up</u> | <u>lb/shutdown</u> |
| <u>NO_x (as NO₂)</u> | <u>480.0</u> | <u>125</u> | <u>125</u> | <u>40</u> |
| <u>CO</u> | <u>5,028</u> | <u>2514</u> | <u>2514</u> | <u>902</u> |
| <u>POC (as CH₄)</u> | <u>83</u> | <u>35.3</u> | <u>79</u> | <u>16</u> |

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by **AQ-19.**

AQ-21. The owner/operator shall not perform combustor tuning on gas turbines more than once every rolling 365 day period for each S-1 and S-3. The owner/operator shall notify the District no later than 7 days prior to combustor tuning activity. (Offsets, Cumulative Emissions)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by **AQ-19.**

AQ-22. The owner/operator shall not allow total combined emissions from the gas turbines and HRSGs (S-1, S-2, S-3 & S-4), S-5 Cooling Tower, and S-6 Fire Pump Diesel Engine, including emissions generated during gas turbine start-ups, combustor tuning, and shutdowns to exceed the following limits during any calendar day:

- (a) 1,553 pounds of NO_x (as NO₂) per day (Cumulative Emissions)
- (b) 1,225 pounds of NO_x per day during ozone season from June 1 to September 30. (CEC Condition of Certification)
- (c) 10,774 pounds of CO per day (PSD)
- (d) 295 pounds of POC (as CH₄) per day (Cumulative Emissions)
- (e) 626 pounds of PM10 per day (PSD)
- (f) 74 pounds of SO₂ per day (BACT)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by **AQ-19.**

AQ-23. The owner/operator shall not allow cumulative combined emissions from the gas turbines and HRSGs (S-1, S-2, S-3 & S-4), S-5 Cooling Tower, and S-6 Fire Pump Diesel Engine, including emissions generated during gas turbine start-ups, combustor tuning, and shutdowns to exceed the following limits during any consecutive twelve-month period:

- (a) 134.6 tons of NO_x (as NO₂) per year (Offsets, PSD)
- (b) 389.3 tons of CO per year (Cumulative Increase, PSD)
- (c) 28.5 tons of POC (as CH₄) per year (Offsets)
- (d) 86.8 tons of PM10 per year (Cumulative Increase, PSD)
- (e) 12.2 tons of SO₂ per year (Cumulative Increase, PSD)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by **AQ-19.**

AQ-24. The owner/operator shall not allow sulfuric acid emissions (SAM) from stacks P-1 and P-2 combined to exceed 7 tons in any consecutive 12 month period. (Basis: PSD)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by **AQ-19.**

AQ-25. The owner/operator shall not allow the maximum projected annual toxic air contaminant emissions (per AQ-28) from the gas turbines and HRSGs (S-1, S-2, S-3 & S-4) combined to exceed the following limits:

| | |
|--|-------------------------------|
| <u>formaldehyde</u> | <u>10,912 pounds per year</u> |
| <u>benzene</u> | <u>226 pounds per year</u> |
| <u>Specified polycyclic aromatic hydrocarbons (PAHs)</u> | <u>1.8 pounds per year</u> |

unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment to determine the total facility risk using the emission rates determined by source testing and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. The owner/operator shall submit the risk analysis to the District and the CPM within 60 days of the source test date. The owner/operator may request that the District and the CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will not result in a significant cancer risk, the District and the CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (Regulation 2, Rule 5)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by AQ-19.

AQ-26. The owner/operator shall demonstrate compliance with AQ-13 through AQ-16, AQ-19(a) through (d), AQ-20, AQ-22(a) and (b), AQ-23(a) and (b) by using properly operated and maintained continuous monitors (during all hours of operation including gas turbine start-up, combustor tuning, and shutdown periods) for all of the following parameters:

- (a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-3 combined, S-2 & S-4 combined.
- (b) Oxygen (O₂) concentration, Nitrogen Oxides (NO_x) concentration, and Carbon Monoxide (CO) concentration at exhaust points P-1 and P-2.
- (c) Ammonia injection rate at A-1 and A-3 SCR Systems

The owner/operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

- (d) Heat Input Rate for each of the following sources: S-1 & S-3 combined, S-2 & S-4 combined.
- (e) Corrected NO_x concentration, NO_x mass emission rate (as NO₂), corrected CO concentration, and CO mass emission rate at each of the following exhaust points: P-1 and P-2.

For each source, source grouping, or exhaust point, the owner/operator shall record the parameters specified in AQ-26(d) and (e) at least once every 15 minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

- (f) total heat input rate for every clock hour and the average hourly heat input rate for every rolling 3-hour period.
- (g) on an hourly basis, the cumulative total heat input rate for each calendar day for the following: each gas turbine and associated HRSG combined and all four sources (S-1, S-2, S-3 and S-4) combined.
- (h) the average NO_x mass emission rate (as NO₂), CO mass emission rate, and corrected NO_x and CO emission concentrations for every clock hour and for every rolling 3-hour period.
- (i) on an hourly basis, the cumulative total NO_x mass emissions (as NO₂) and the cumulative total CO mass emissions, for each calendar day for the following: each gas turbine and associated HRSG combined and all four sources (S-1, S-2, S-3 and S-4) combined.
- (j) For each calendar day, the average hourly heat input rates, corrected NO_x emission concentration, NO_x mass emission rate (as NO₂), corrected CO emission concentration, and CO mass emission rate for each gas turbine and associated HRSG combined and the auxiliary boiler.
- (k) on a daily basis, the cumulative total NO_x mass emissions (as NO₂) and cumulative total CO mass emissions, for the previous consecutive twelve month period for all four sources (S-1, S-2, S-3 and S-4) combined.

(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

Verification: At least 30 days before first fire, the project owner shall submit to the CPM a plan on how the measurements and recordings required by this condition will be performed.

AQ-27. To demonstrate compliance with conditions AQ-19(f) thru (h), AQ-22(c) thru (e), and AQ-23(c) thru (e), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM₁₀) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO₂) mass emissions from each power train. The owner/operator shall use the actual heat input rates measured pursuant to AQ-26, actual gas turbine start-up times, actual gas turbine shutdown times, and CEC and District-approved emission factors developed pursuant to source testing under AQ-30 to calculate these emissions. The owner/operator shall present the calculated emissions in the following format:

- (a) For each calendar day, POC, PM₁₀, and SO₂ emissions, summarized for each power train (gas turbine and its respective HRSG combined) and all four sources (S-1, S-2, S-3 & S-4) combined
- (b) on a daily basis, the cumulative total POC, PM₁₀, and SO₂ mass emissions, for each year for all eight sources (S-1, S-2, S-3 & S-4) combined
(Offsets, PSD, Cumulative Increase)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by **AQ-19**.

AQ-28. To demonstrate compliance with **AQ-25**, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: **Formaldehyde, Benzene, and Specified PAH's.** The owner/operator shall calculate the maximum projected annual emissions using the maximum annual heat input rate of 35,708,858 MM BTU/year and the highest emission factor (pounds of pollutant per MM BTU of heat input) determined by any source test of the S-1 and S-3 gas turbines and/or S-2 and S-4 HRSGs. If the highest emission factor for a given pollutant occurs during minimum-load turbine operation, a reduced annual heat input rate may be utilized to calculate the maximum projected annual emissions to reflect the reduced heat input rates during gas turbine start-up and minimum-load operation. The reduced annual heat input rate shall be subject to District review and approval. (Regulation 2, Rule 5)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by **AQ-19**.

AQ-29. Within 90 days of start-up of the RCEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 to determine the corrected ammonia (NH_3) emission concentration to determine compliance with **AQ-19(e)**. The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-2 or A-4 SCR System ammonia injection rate, and the corresponding NH_3 emission concentration at emission point P-1 or P-2. The source test shall be conducted over the expected operating range of the turbine and HRSG (including, but not limited to, minimum and full load modes) to establish the range of ammonia injection rates necessary to achieve NO_x emission reductions while maintaining ammonia slip levels. The owner/operator shall repeat the source testing on an annual basis thereafter. Ongoing compliance with **AQ-20(e)** shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. The owner/operator shall submit the source test results to the District and the CPM within 60 days of conducting the tests. (Regulation 2, Rule 5)

Verification: The project owner shall notify the District and the CPM within seven (7) working days before the execution of the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

AQ-30. Within 90 days of start-up of the RCEC and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each gas turbine and associated Heat Recovery Steam Generator are operating at maximum load to determine compliance with **AQ-19(a),(b),(c),(d),(f),(g), and (h)** and while each gas turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with **AQ-19(c) and (d)**, and to verify the accuracy of the continuous

emission monitors required in AQ-26. The owner/operator shall test for (as a minimum): water content; stack gas flow rate; oxygen concentration; precursor organic compound concentration and mass emissions; nitrogen oxide concentration and mass emissions (as NO₂); carbon monoxide concentration and mass emissions; sulfur dioxide concentration and mass emissions; methane; ethane; and, particulate matter (PM₁₀) emissions, including condensable particulate matter. The owner/operator shall submit the source test results to the District and the CPM within 60 days of conducting the tests. (BACT, offsets)

Verification: The project owner shall notify the District and the CPM within seven (7) working days before the execution of the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

AQ-31. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the owner/operator shall measure the contribution of condensable PM (back half) to the total PM₁₀ emissions. However, the owner/operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. The owner/operator shall submit the source test results to the District and the CPM within 60 days of conducting the tests. (BACT)

Verification: Approval of the source test procedures, as required in AQ-31, and the source test reports shall be deemed as verification for this condition. The project owner shall notify the District and the CPM within seven (7) working days before the execution of the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

AQ-32. Within 90 days of start-up of the RCEC and on a biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 while the gas turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with AQ-25. The owner/operator shall also test the gas turbine while it is operating at minimum load. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to AQ-25 for any of the compounds listed below are less than the BAAQMD trigger levels, pursuant to Regulation 2, Rule 5, shown, then the owner/operator may discontinue future testing for that pollutant:

Benzene ≤ 6.4 pounds/year and 2.9 pounds/hour
Formaldehyde < 30 pounds/year and 0.21 pounds/hour
Specified PAHs ≤ 0.011 pounds/year
(Regulation 2, Rule 5)

Verification: The project owner shall notify the District and the CPM within seven (7) working days before the execution of the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

AQ-33. The owner/operator shall calculate the SAM emission rate using the total heat input for the sources and the highest results of any source testing conducted pursuant to AQ-30. If this SAM mass emission limit of AQ-24 is exceeded, the owner/operator must utilize air dispersion modeling to determine the impact (in $\mu\text{g}/\text{m}^3$) of the sulfuric acid mist emissions pursuant to Regulation 2-2-306. (PSD)

Verification: The project owner shall notify the District and the CPM within seven (7) working days before the execution of the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

AQ-34. Within 90 days of start-up of the RCEC and on a semi-annual basis (twice per year) thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each gas turbine and HRSG duct burner is operating at maximum heat input rates to demonstrate compliance with the SAM emission rates specified in AQ-24. The owner/operator shall test for (as a minimum) SO_2 , SO_3 , and H_2SO_4 . After acquiring one year of source test data on these sources, the owner/operator may petition the District to reduce the test frequency to an annual basis if test result variability is sufficiently low as determined by the District. The owner/operator shall submit the source test results to the District and the CPM within 60 days of conducting the tests. (PSD)

Verification: The project owner shall notify the District and the CPM within seven (7) working days before the execution of the source tests required in this condition. Source test results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

AQ-35. The owner/operator of the RCEC shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)

Verification: The project owner shall submit to the District and CPM the reports as required by procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual.

AQ-36. The owner/operator of the RCEC shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and

related incidents. The owner/operator shall make all records and reports available to District and the CPM staff upon request. (Regulation 2-6-501)

Verification: During site inspection, the project owner shall make all records and reports available to the District, ARB, EPA or CEC staff.

AQ-37. The owner/operator of the RCEC shall notify the District and the CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)

Verification: Submittal of these notifications as required by this condition is the verification of these permit conditions. In addition, as part of the quarterly and annual compliance reports of AQ-19, the project owner shall include information on the dates when these violations occurred and when the project owner notified the District and the CPM.

AQ-38. The owner/operator shall ensure that the stack height of emission points P-1 and P-2 is each at least 145 feet above grade level at the stack base. (PSD, Regulation 2-5)

Verification: At least 120 days prior to construction of the turbine stacks, the project owner shall provide the District and CPM an "approved for construction" drawing showing the appropriate stack height and location of sampling ports and platforms. The project owner shall make the site available to the District, EPA and CEC staff for inspection.

AQ-39. The owner/operator of RCEC shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall comply with the District Manual of Procedures, Volume IV, Source Test Policy and Procedures, and shall be subject to BAAQMD review and approval. (Regulation 1-501)

Verification: At least 120 days prior to construction of the turbine stacks, the project owner shall provide the District and CPM an "approved for construction" drawing showing the appropriate stack height and location of sampling ports and platforms. The project owner shall make the site available to the District, EPA and CEC staff for inspection.

AQ-40. Within 180 days of the issuance of the Authority to Construct for the RCEC, the owner/operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous emission monitors, sampling ports, platforms, and source tests required by AQ-29, 30, 32, 34, and 43. The owner/operator shall conduct all source testing and monitoring in accordance with the District approved procedures. (Regulation 1-501)

Verification: Compliance with this condition is the verification of this permit condition.

AQ-41. Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of the RCEC shall submit an application to the BAAQMD for a major facility review permit within 12 months of completing construction as demonstrated by the first firing of any gas turbine or HRSG duct burner. (Regulation 2-6-404.1)

Verification: The project owner shall submit to the CPM copies of the Federal (Title IV) Acid Rain and (Title V) Operating Permit within 30 days after they are issued by the District.

AQ-42. Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the Russell City Energy Center shall submit an application for a Title IV operating permit to the BAAQMD at least 24 months before operation of any of the gas turbines (S-1, S-3, S-5, or S-7) or HRSGs (S-2, S-4, S-6, or S-8). (Regulation 2, Rule 7)

Verification: The project owner shall submit to the CPM copies of the Federal (Title IV) Acid Rain and (Title V) Operating Permit within 30 days after they are issued by the District.

AQ-43. The owner/operator shall ensure that the Russell City Energy Center complies with the continuous emission monitoring requirements of 40 CFR Part 75. (Regulation 2, Rule 7)

Verification: At least 60 days prior to the installation of the CEMS, the project owner shall seek approval from the District for an emission monitoring plan.

Permit Conditions for Cooling Towers

AQ-44. The owner/operator shall properly install and maintain the S-5 cooling tower to minimize drift losses. The owner/operator shall equip the cooling towers with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 8,000 ppmw (mg/l). The owner/operator shall sample and test the cooling tower water at least once per day to verify compliance with this TDS limit. (PSD)

Verification: At least 120 days prior to construction of the cooling tower, the project owner shall provide the District and CPM an "approved for construction" drawing and specifications for the cooling tower and the high-efficiency mist eliminator.

AQ-45. The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to the initial operation of the Russell City Energy Center, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in a satisfactory manner. Within 60 days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM10 emission rate from the cooling tower to verify compliance with the

vendor-guaranteed drift rate specified in AQ-44. The CPM may require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in AQ-44. (PSD)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by AQ-19.

Permit Conditions for S-6 Fire Pump Diesel Engine

AQ-46. The owner/operator shall not operate S-6 Fire Pump Diesel Engine more than 50 hours per year for reliability-related activities. ("Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(2)(A)(3) or (e)(2)(B)(3), offsets)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by AQ-19.

AQ-47. The owner/operator shall operate S-6 Fire Pump Diesel Engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission testing). Operating hours while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited. ("Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection 9e)(2)(A)(3) or (e)(2)(B)(3))

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by AQ-19.

AQ-48. The owner/operator shall operate S-6 Fire Pump Diesel Engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. ("Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(G)(1), cumulative increase)

Verification: The project owner shall submit to the District and CPM the quarterly and annual compliance reports as required by AQ-19.

AQ-49. Records: The owner/operator shall maintain the following monthly records in a District-approved log for at least 60 months from the date of entry. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.

- a. Hours of operation for reliability-related activities (maintenance and testing).
- b. Hours of operation for emission testing to show compliance with emission limits.
- c. Hours of operation (emergency).
- d. For each emergency, the nature of the emergency condition.
- e. Fuel usage for each engine(s).

(Basis: "Stationary Diesel Engine ATCM" section 93115, title 17, CA Code of Regulations, subsection (e)(4)(l), cumulative increase)

Verification: During site inspection, the project owner shall make all records and reports available to the District, ARB, EPA or CEC staff.

CONSTRUCTION CONDITIONS OF CERTIFICATION

~~AQ-C1~~ The project owner/operator shall submit the resume(s) of their selected Construction Mitigation Manager(s) (CMM) to the Energy Commission Compliance project Manager (CPM) for approval. The owner/operator shall be responsible for funding the costs of the CMM however the CMM shall report to the CPM. The CMM shall preferably have a minimum of 8 years experience as follows, however the CPM shall consider all resumes submitted regardless of experience:

- ~~5 years construction experience as a subcontractor or general contractor.~~
- ~~An engineering degree or an additional 5 years construction experience.~~
- ~~1 year construction project management experience.~~
- ~~2 years air quality assessment experience.~~

~~The project owner/operator shall make available a dedicated office for the CMM. The CMM shall be responsible for implementing all mitigation measures related to construction equipment combustion emissions, as outlined in Conditions of Certification AQ-C4. A CMM shall be on site or available to be on site at any time, until deemed no longer necessary by the CPM. The CMM shall be granted access to all areas of the main and related linear facility construction sites. The CMM shall have the authority to appeal to the CPM to have the CPM stop construction on either the main or the related linear facility construction sites as warranted by specific mitigation measures. The CMM may not be terminated prior to the cessation of all construction activities unless approval is granted by the CPM.~~

~~Verification:~~ The project owner/operator shall submit the CMM resume(s) to the CPM for approval at least sixty (60) days prior to site mobilization.

~~AQ-C2~~ The CMM shall submit to the CPM for approval, a Monthly Construction Compliance Report (MCCR). The MCCR will, at a minimum, summarize all compliance actions taken germane to Conditions of Certification AQ-C3 and AQ-C4. The MCCR shall include, at a minimum, the following elements:

Fugitive Dust Mitigation Monthly Report (see Condition of Certification AQ-C3)

- ~~Identification of specific mitigation measure performed, the location performed, date performed and date enforced or verified as remaining effective.~~
- ~~Identification of any transgressions or circumventions of mitigation measure and the actions taken to correct the situation.~~

- Identification of any observation by the CMM of dust plumes beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) were taken to abate the plume.
- A summary report of all ambient air monitoring data.

**~~Diesel Construction Equipment Mitigation Monthly Report
(see Condition of Certification AQ-C4)~~**

- Identification of any changes, as approved by the CPM, to the Diesel Construction Equipment Mitigation Plan from the initial report or the last monthly report including any new contractors and their diesel construction equipment.
- A Copy of all receipt or other documentation indicating type and amount of fuel purchased, from whom, where delivered and on what date for the main and related linear construction sites.
- Identification and verification of all diesel engines required to meet EPA or CARB 1996 off-road diesel equipment emission standards.
- The suitability of the use of a catalyzed diesel particulate filter for a specific piece of construction equipment is to be determined by a qualified mechanic or engineer who must submit a report through the CMM to the CPM for approval. The identification of any suitability report being initiated, pursued or the completed report should be included the monthly report (in the month that it was completed) as should the verification of any subsequent installation of a catalyzed diesel particulate filter.
- Identification of any observation by the CMM of dark plumes emanating from diesel fire construction equipment beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) were taken to abate the plume or future expected plumes.

Verification: The CMM shall submit to the CPM for approval, the Monthly Construction Compliance Report (MCCR) for each month by the 15th (or the following Monday if the 15th is a Saturday or Sunday) of the following month while construction is occurring at the main or related linear construction sites.

~~AQ-C3~~ The project owner/operator shall prepare and submit to the CPM for approval a Fugitive Dust Mitigation Plan (FDMP) that specifically identifies all fugitive dust mitigation measures that will be employed for the construction of the facility and administered on site. The construction mitigation measures that shall be addressed in the FDMP include, but are not limited to, the following:

- Identification of the employee parking area(s) and surface composition of those parking area(s)
- The frequency of watering of unpaved roads and all disturbed areas
- Application of chemical dust suppressants
- Gravel in high traffic areas

- ~~Paved access aprons~~
- ~~Sandbags to prevent run-off~~
- ~~Posted speed limit signs~~
- ~~Wheel washing areas prior to large trucks leaving the project site~~
- ~~Methods that will be used to clean tracked out mud and dirt from the project site onto public roads~~
- ~~For any transportation of borrowed fill material

 1. ~~Vehicle covers~~
 2. ~~Wetting of the transported material~~
 3. ~~Appropriate freeboard~~~~
- ~~Methods for the stabilization of storage piles and disturbed areas~~
- ~~Windbreaks at appropriate locations~~
- ~~Additional mitigation measures to be implemented at the direction of the CMM in the event that the standard measures fail to completely control dust from any activity and/or source~~
- ~~The suspension of all earth moving activities under windy Conditions~~
- ~~On site monitoring devices~~

~~In monitoring the effectiveness of all mitigation measures included in the FDMP, the CMM shall take into account the following, at a minimum:~~

- a) ~~On site spot checks of soil moisture content at locations where soil disturbance, movement, and/or storage is occurring;~~
- b) ~~Visual observations of all construction activities; and~~
- c) ~~Review the results of Los Esteros Critical Energy Facility Air Monitoring Demonstration project, (LECEF)~~
- d) ~~At least 45 days prior to site mobilization, the applicant shall meet with staff, CMM and CPM for LECEF, and the CPM for RCEC to determine the effectiveness of the PM10 site monitoring for LECEF, and whether a similar Construction Monitoring Demonstration Program should be required during construction of the RCEC. The results of this meeting will be reported in the Fugitive Dust Mitigation Plan.~~

~~The CMM shall implement the following procedures for additional mitigation measures if the CMM determines that the existing mitigation measures are not resulting in adequate mitigation:~~

1. ~~The CMM shall direct more aggressive application of the existing mitigation methods within fifteen (15) minutes of making such a determination.~~
2. ~~The CMM shall direct implementation of additional methods of dust suppression if step #1 specified above fails to result in adequate mitigation within thirty (30) minutes of the original determination.~~

3. ~~The CMM shall have the authority to appeal to the CPM to have the CPM direct a temporary shutdown of the source of the emissions if step #2 specified above fails to result in adequate mitigation within one (1) hour of the original determination. If the CPM grants the request for shutdown, the activity shall not restart until the CPM authorizes restarting of the activity.~~

~~**Verification:** At least thirty (30) days prior to site mobilization, the project owner/operator shall provide the CPM with a copy of the Fugitive Dust Mitigation Plan (FDMP) for approval. Site mobilization shall not commence until the project owner/operator receives approval of the FDMP from the CPM. If the results of the LECEF Demonstration project are not available in time for their consideration in the initial FDMP, Staff and the project owner/operator will meet and confer regarding the applicability of the LECEF Demonstration project to the RCEG project after such results are made available to Staff and the project owner/operator. If Staff and project owner/operator are in agreement, the FDMP may be amended to reflect such agreement. If the Staff and Applicant are not in agreement after informal dispute resolution process are exhausted, then the Staff and the project owner shall each file a petition with the Energy Commission to resolve any differences between the parties regarding the applicability of the LECEF Demonstration project to the RCEG project.~~

~~**AQ-C4** The project owner/operator shall prepare and submit to the CPM for approval a Diesel Construction Equipment Mitigation Plan (DCEMP) that will specifically identify diesel engine mitigation measures that will be employed during the construction phase of the main and related linear construction sites. The project owner/operator will be responsible for implementing and maintaining all measure identified in the DCEMP. The DCEMP shall include the following:~~

1. ~~A list of all diesel-fueled, off-road, stationary or portable construction-related equipment to be used either on the main or the related linear construction sites. This list will initially be estimated and then subsequently be updated as specific contractors become identified. Prior to a contractor gaining access to the main or related linear construction sites, the project owner/operator will submit to the CPM for approval, an update of this list including all of the new contractor's diesel construction equipment.~~
2. ~~Each piece of construction equipment listed under item #1 of this Condition must demonstrate compliance according to the following mitigation requirements, except as noted in items #3, #4 and #5 of this Condition:~~

| Engine Size (BHP) | 1996 CARB or EPA-Certified Engine | Required Mitigation |
|--------------------------|--|--|
| < 100 | NA | ULSD |
| > or = 100 | Yes | ULSD |
| > or = 100 | No | ULSD AND CDPF, IF SUITABLE AS DETERMINED BY THE CPM |

- ~~3. If the construction equipment is intended to be on-site for ten (10) days or less, then none of the mitigation measures identified in item #2 of this Condition are required.~~
- ~~4. The CPM may grant relief from the mitigation measures listed in item #2 of this Condition for a specific piece of equipment if the project owner/operator can demonstrate that they have made a good faith effort to comply with the mitigation measures and that compliance is not possible.~~
- ~~5. Any implemented mitigation measure in item #2 of this Condition may be terminated immediately if one of the following Conditions exists, however the CPM must be informed within ten (10) working days of the termination:~~
 - ~~5.1 The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or reduced power output due to an excessive increase in back pressure.~~
 - ~~5.2 The measure is causing or is reasonably expected to cause significant engine damage.~~
 - ~~5.3 The measure is causing or is reasonably expected to cause a significant risk to workers or the public.~~
 - ~~5.4 Any other seriously detrimental cause that has approval by the CPM prior to the termination being implemented.~~
- ~~6. All contractors must agree to limit diesel engine idle time on all diesel-powered equipment to no more than ten (10) minutes, to the extent practical.~~

~~**Verification:** The project owner/operator shall submit the initial Diesel Construction Equipment Mitigation Plan (DCEMP) to the CPM for approval at least thirty (30) days prior to site mobilization. The project owner/operator will update the initial DCEMP as necessary, no less than ten (10) days prior to a specific contractor gaining access to either the main or related linear construction sites. The project owner/operator will notify the CPM of any emergency termination within ten (10) working days of the termination.~~

Operations Conditions of Certification

~~All definitions presented in the Bay Area Air Quality Management District's Final Determination of Compliance for the Russell City Energy Center apply to the following Conditions of Certification.~~

Process Equipment

- ~~S-1 Combustion Turbine Generator (CTG) #1, Westinghouse 501F, 1979.4 MMBtu/hr maximum rated capacity, natural gas fired only; Abated by A-1 Selective Catalytic Reduction (SCR) System.~~
- ~~S-2 Heat Recovery Steam Generator (HRSG) #1, with Duct Burner Supplemental Firing System, 200 MMBtu/hr maximum rated capacity; Abated by A-1 Selective Catalytic Reduction (SCR) System.~~

~~S-3 Combustion Turbine Generator (CTG) #2, Westinghouse 501F, 1979.4 MMBtu/hr maximum rated capacity, natural gas fired only; Abated by A-2 Selective Catalytic Reduction (SCR) System.~~

~~S-4 Heat Recovery Steam Generator (HRSG) #2, with Duct Burner Supplemental Firing System, 200 MMBtu/hr maximum rated capacity; Abated by A-2 Selective Catalytic Reduction (SCR) System.~~

~~S-5 Cooling Tower, Ten Cells, 135,000 gallons per minute~~

~~S-6 Emergency Generator, with Caterpillar G3512-90-LE natural gas fired engine, 660 kW, 6.44 MMBtu/hr input~~

~~S-7 Diesel Engine, Cummins 6CTA8.3-F3, 400 hp, 2.11 MMBtu/hr input~~

~~**AQ-1** The owner/operator of the RCEC shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 and S-3 Gas Turbines and S-2 and S-4 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period. Conditions AQ-1 through AQ-12 shall only apply during the commissioning period as defined in the District FDOC. Unless otherwise indicated, Conditions AQ-13 through AQ-56 shall apply after the commissioning period has ended.~~

~~**Verification:** The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by Condition AQ-5 and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by Condition AQ-11.~~

~~**AQ-2** At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune the S-1 & S-3 Gas Turbine combustors and S-2 & S-4 Heat Recovery Steam Generator duct burners to minimize the emissions of carbon monoxide and nitrogen oxides.~~

~~**Verification:** The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by Condition AQ-5 and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by Condition AQ-11.~~

~~**AQ-3** At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall install, adjust, and operate the SCR systems to minimize the emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 Gas Turbines and S-2 & S-4 Heat Recovery Steam Generators.~~

~~**Verification:** The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by Condition AQ-5 and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by Condition AQ-11.~~

~~AQ-4~~ Coincident with the as-designed operation of A-1 & A-2 SCR Systems, pursuant to Conditions ~~AQ-3, AQ-10, AQ-11, and AQ-12~~, the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) the owner/operator shall operate the facility in a manner such that comply with the NO_x and CO emission limitations specified in Conditions ~~AQ-20(a) through AQ-20(d)~~.

~~**Verification:**~~ The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by Condition ~~AQ-5~~ and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by Condition ~~AQ-11~~.

~~AQ-5~~ The owner/operator of the RCEC shall submit a plan to the District Permit Services Division and the CPM describing the procedures to be followed during the commissioning of the gas turbines and HRSGs. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_x combustors, the installation and operation of the SCR systems and oxidation catalysts, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) without abatement by their respective SCR System. Neither Gas Turbine (S-1 or S-3) shall be fired sooner than 28 days after the District receives the commissioning plan.

~~**Verification:**~~ The project owner/operator shall submit a Commissioning Plan to the District Permit Services Division and the CPM for approval at least four (4) weeks prior to first fire of S-1, S-2, S-3 and S-4.

~~AQ-6~~ During the commissioning period, the owner/operator of the RCEC shall demonstrate compliance with Conditions ~~AQ-8 through AQ-11~~ through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

- ~~a.~~ Firing hours for each gas turbine (S-1 and S-3) and each HRSG (S-2 and S-4)
- ~~b.~~ Fuel flow rates to each train
- ~~c.~~ Stack gas nitrogen oxide emission concentrations at P-1 and P-2
- ~~d.~~ Stack gas carbon monoxide emission concentrations P-1 and P-2
- ~~e.~~ Stack gas carbon dioxide concentrations P-1 and P-2

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4). The owner/operator shall use District-approved methods to calculate heat input rates, NO_x mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request.

~~**Verification:**~~ The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by Condition ~~AQ-5~~

and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by Condition AQ-11.

~~AQ-7~~ The owner/operator shall install, calibrate, and make operational District-approved continuous emission monitors specified in Condition 6 prior to first firing of the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4). After first firing of the turbines and auxiliary boilers, the detection range of these continuous emission monitors as necessary to accurately measure the resulting range of CO and NO_x emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

~~**Verification:**~~ The project owner/operator shall notify the District and CPM of the date of expected first fire at least thirty (30) days prior to first fire and shall make the project site available for inspection if desired by either the District or CPM. The project owner/operator shall propose a schedule of compliance with this Condition of Certification in the Commissioning Plan required by Condition AQ-5 and document continuing compliance with this Condition of Certification in each Monthly Emissions Report required by Condition AQ-11.

~~AQ-8~~ The owner/operator shall not operate the facility such that the total number of firing hours of S-1 Gas Turbine and S-2 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-1 SCR System shall not exceed 300 hours during the commissioning period. Such operation of S-1 Gas Turbine and S-2 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

~~**Verification:**~~ The project owner/operator shall submit documentation of compliance with this Condition of Certification in the Monthly Emissions Report required by Condition AQ-11.

~~AQ-9~~ The total number of firing hours of S-3 Gas Turbine and S-4 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-2 SCR System shall not exceed 300 hours during the commissioning period. Such operation of S-3 Gas Turbine and S-4 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR or Oxidation Catalyst Systems fully operational. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

~~**Verification:**~~ The project owner/operator shall submit documentation of compliance with this Condition of Certification in the Monthly Emissions Report required by Condition AQ-11.

~~AQ-10~~ The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM₁₀, and sulfur dioxide that are emitted by the Gas

~~Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in Condition AQ-25.~~

~~**Verification:** The project owner/operator shall submit documentation of compliance with this Condition of Certification in the Monthly Emissions Report required by Condition AQ-11.~~

~~**AQ-11** Combined pollutant mass emissions from the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1 & S-3).~~

| | | |
|---|---|--------------------------------|
| NO_x (as NO₂) | 7,880 pounds per calendar day | 400 pounds per hour |
| CO | 17,716 pounds per calendar day | 584 pounds per hour |
| POC (as CH₄) | 230 pounds per calendar day | |
| PM₁₀ | 456 pounds per calendar day | |
| SO₂ | 77 pounds per calendar day | |

~~**Verification:** During the Commissioning Period, as defined in the district FDOC, the project owner/operator shall submit to the CPM for approval, a Monthly Emissions Report that includes, but is not limited to, fuel use, turbine operation, post combustion control operation, ammonia use and CEM readings on an hourly and daily basis. The Monthly Emissions Report for each month must be submitted by the 15th (or the following Monday if the 15th is a Saturday or Sunday) of the following month.~~

~~**AQ-12** Prior to the end of the Commissioning Period, the Owner/Operator shall conduct a District and Energy Commission approved source test using external continuous emission monitors to determine compliance with Condition AQ-20. The source test shall determine NO_x, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods.~~

~~**Verification:** No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this Condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within thirty (30) days of the source testing date.~~

~~Conditions for the Gas Turbines (S-1 & S-3) and the Heat Recovery Steam Generators (HRSGs; S-2 & S-4)~~

~~AQ-13 The owner/operator shall fire the Gas Turbines (S-1 and S-3) and HRSG Duct Burners (S-2 and S-4) exclusively on natural gas. (BACT for SO₂ and PM₁₀)~~

~~**Verification:** The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and Energy Commission.~~

~~AQ-14 The owner/operator shall not exceed 2,170.4 MM Btu per hour, averaged over any rolling 3-hour period from the combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4). (PSD¹⁵ for NO_x)~~

~~**Verification:** A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~AQ-15 The owner/operator shall not exceed 52,306 MM Btu per calendar day from the combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4). (PSD for PM₁₀)~~

~~**Verification:** A detailed report of fuel use and equipment operation shall be included in the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~AQ-16 The owner/operator shall not exceed 34,679,108 MM Btu per year from the combined cumulative heat input rate for the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4). (Offsets)~~

~~**Verification:** A detailed report of fuel use and equipment operation shall be included in each January 30 Quarterly Air Quality Report as required by the verification of Condition AQ-36.~~

~~AQ-17 The owner/operator shall not fire HRSG duct burners (S-2 and S-4) unless its associated Gas Turbine (S-1 and S-3, respectively) is in operation. (BACT for NO_x)~~

~~**Verification:** The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~AQ-18 The owner/operator shall properly operate and properly maintain A-1 Selective Catalytic Reduction (SCR) System except as provided in Condition AQ-8, whenever fuel is combusted at S-1 Gas Turbine and/or S-2 HRSG and A-1 catalyst bed has reached minimum operating temperature. (BACT for NO_x)~~

~~**Verification:** The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and Energy Commission.~~

¹⁵ PSD is the prevention of significant deterioration.

~~**AQ-19** The owner/operator shall properly operate and properly maintain A-2 Selective Catalytic Reduction (SCR) System except as provided in Condition **AQ-9**, whenever fuel is combusted at S-2 Gas Turbine and/or S-4 HRSG and A-2 catalyst bed has reached minimum operating temperature. (BACT for NO_x)~~

~~**Verification:** The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and Energy Commission.~~

~~**AQ-20** The owner/operator of Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode and steam injection power augmentation mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (BACT, PSD, and Toxic Risk Management Policy)~~

- ~~(a) Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO₂) at P-1 (the combined exhaust point for the S-1 Gas Turbine and the S-2 HRSG after abatement by A-1 SCR System) shall not exceed 19.5 pounds per hour or 0.0090 lb/MM Btu (HHV) of natural gas fired. Nitrogen oxide mass emissions (calculated in accordance with District approved methods as NO₂) at P-2 (the combined exhaust point for the S-2 Gas Turbine and the S-4 HRSG after abatement by A-2 SCR System) shall not exceed 19.5 pounds per hour or 0.0090 lb./MM Btu (HHV) of natural gas fired. (PSD for NO_x)~~
- ~~(b) The nitrogen oxide emission concentration at emission points P-1 and P-2 each shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O₂, averaged over any 1-hour period. (BACT for NO_x)~~
- ~~(c) Carbon monoxide mass emissions at P-1 and P-2 each shall not exceed 0.0087 lb./MM Btu (HHV) of natural gas fired or 28.3 pounds per hour, averaged over any rolling 3-hour period. (PSD for CO)~~
- ~~(d) The carbon monoxide emission concentration at P-1 and P-2 each shall not exceed 4 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. (BACT for CO)~~
- ~~(e) Ammonia (NH₃) emission concentrations at P-1 and P-2 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. The continuous recording of the ammonia injection rate to A-1 and A-2 SCR Systems shall verify this ammonia emission concentration. The correlation between the gas turbine and HRSG heat input rates, A-1 and A-2 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with permit Condition **AQ-31**. (TRMP for NH₃)~~
- ~~(f) Precursor organic compound (POC) mass emissions (as CH₄) at P-1 and P-2 each shall not exceed 2.72 pounds per hour or 0.00125 lb/MM Btu of natural gas fired. (BACT)~~

- (g) ~~Sulfur dioxide (SO₂) mass emissions at P-1 and P-2 each shall not exceed 1.51 pounds per hour or 0.0007 lb/MM Btu of natural gas fired. Sulfur content of the natural gas shall not exceed 0.25 grains/100 scf. (BACT)~~
- (h) ~~Particulate matter (PM₁₀) mass emissions at P-1 and P-2 each shall not exceed 9 pounds per hour or 0.00455 lb/MM Btu of natural gas fired when the HRSG duct burners are not in operation. Particulate matter (PM₁₀) mass emissions at P-1 and P-2 each shall not exceed 12 pounds per hour or 0.00551 lb./MM Btu of natural gas fired when the HRSG duct burners are in operation. (BACT)~~

Verification: ~~The project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

AQ-21 ~~The owner/operator shall operate the facility such that the regulated air pollutant mass emission rates from each of the Gas Turbines (S-1 and S-3) during a start-up or a shutdown does not exceed the following limits: (PSD)~~

| | Cold Start-Up (lb/start-up) | Hot Start-Up (lb/start-up) | Shutdown (lb/shutdown) |
|--|--|---|---------------------------------------|
| Oxides of Nitrogen (as NO ₂) | 240 | 80 | 48 |
| Carbon Monoxide (CO) | 2,514 | 902 | 43.8 |
| Precursor Organic Compounds (as CH ₄) | 48 | 46 | 5 |

Verification: ~~The project owner/operator shall submit documentation of compliance with the emission limits in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

AQ-22 ~~The owner/operator shall not operate in start-up mode for both Gas Turbines (S-1 and S-3) simultaneously. (PSD)~~

Verification: ~~The project owner/operator shall submit documentation of all start-up events as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

AQ-23 ~~The owner/operator shall design and construct the heat recovery steam generators (S-2 & S-4) and associated ducting such that an oxidation catalyst can be readily installed and properly operated if deemed necessary by the APCO or CPM to insure compliance with the CO and/or POC emission rate limitations of Conditions AQ-20(c), AQ-20(d) and AQ-20(f). (BACT)~~

Verification: ~~Prior to the first firing of natural gas in either turbine the owner/operator shall provide as built drawings or other suitable proof of compliance with this Condition of Certification to the District and the CPM.~~

AQ-24 ~~The owner/operator shall not exceed the total combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated during Gas Turbine start-ups and shutdowns for the following limits during any calendar day:~~

- (a) 1,364 pounds of NO_x (as NO₂) per day (CEQA)
- (b) **7,882 POUNDS OF CO PER DAY** (PSD)
- (c) 230 pounds of POC (as CH₄) per day (CEQA)
- (d) 456 pounds of PM₁₀ per day (PSD)
- (e) 78 pounds of SO₂ per day (BACT)

Verification: The project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-36**.

AQ-25 The owner/operator shall not exceed the cumulative combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), Cooling Tower (S-5), Emergency Generator (S-6) and Fire Pump Engine (S-7), including emissions generated during gas turbine start ups and shutdowns for the following limits during any consecutive twelve month period:

- (a) 134.6 tons of NO_x (as NO₂) per year (Offsets, PSD)
- (b) 584.2 tons of CO per year (Cumulative Increase, PSD)
- (c) 27.8 tons of POC (as CH₄) per year (Offsets)
- (d) 86.4 tons of PM₁₀ per year (Cumulative Increase, PSD)
- (e) 12.2 tons of SO₂ per year (Cumulative Increase)

Verification: The project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-36**.

AQ-26 The owner/operator shall not exceed 7 tons in any consecutive four quarters of sulfuric acid emissions (SAM) from P-1 and P-2. (Basis: PSD)

Verification: The project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-36**.

AQ-27 The owner/operator shall not exceed the maximum projected annual toxic air contaminant emissions (per Condition **AQ-29**) from the Gas Turbines and HRSGs combined (S-1, S-2, S-3, and S-4) for the following limits:

- 3,726 Pounds of formaldehyde per year
- 2,324 Pounds of acetaldehyde per year
- 218 Pounds of acrolein per year
- 461 Pounds of benzene per year
- 22.4 Pounds of specified polycyclic aromatic hydrocarbons (PAHs) per year unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. The owner/operator may request that the District and the GPM revise the carcinogenic compound emission limits specified above. If the

~~owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and the CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. [Toxic Risk Management Policy (TRMP).]~~

~~**Verification:** If prepared, the health risk analysis shall be submitted to the District and the CPM within sixty (60) days of the source test date. Otherwise, the project owner/operator shall submit documentation of compliance with all emission limits specified in this Condition of Certification as part of the January 30 Quarterly Air Quality Report each year required by the verification of Condition AQ-36.~~

~~**AQ-28** The owner/operator shall demonstrate compliance with Conditions AQ-14 through AQ-17, AQ-20(a) through AQ-20(d), AQ-21, AQ-24(a), AQ-24(b), AQ-25(a), and AQ-25(b) by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:~~

- ~~(a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-3 combined and S-2 & S-4 combined.~~
- ~~(b) Carbon Dioxide (CO₂) or Oxygen (O₂) concentrations, Nitrogen Oxides (NO_x) concentrations, and Carbon Monoxide (CO) concentrations at each of the following exhaust points: P-1 and P-2.~~
- ~~(c) Ammonia injection rate at A-1 and A-2 SCR Systems~~
- ~~(d) Steam injection rate at S-1 & S-3 Gas Turbine Combustors~~

~~The owner/operator shall record all of the above parameters every fifteen (15) minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and average hourly pollutant emission concentrations.~~

~~The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:~~

- ~~(e) Heat Input Rate for each of the following sources: S-1 & S-3 combined and S-2 & S-4 combined.~~
- ~~(f) Corrected NO_x concentrations, NO_x mass emissions (as NO₂), corrected CO concentrations, and CO mass emissions at each of the following exhaust points: P-1 and P-2. Applicable to emission points P-1 and P-2, the owner/operator shall record the parameters specified in Conditions AQ-28(e) and AQ-28(f) at least once every fifteen (15) minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:~~
- ~~(g) Total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.~~
- ~~(h) On an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined~~

~~and all four sources (S-1, S-2, S-3, and S-4) combined.~~

- ~~(i) The average NO_x mass emissions (as NO₂), CO mass emissions, and corrected NO_x and CO emission concentrations for every clock hour and for every rolling 3-hour period.~~
- ~~(j) On an hourly basis, the cumulative total NO_x mass emissions (as NO₂) and the cumulative total CO mass emissions, for each calendar day for the following: each Gas Turbine and associated HRSG combined, and all four sources (S-1, S-2, S-3, and S-4) combined.~~
- ~~(k) For each calendar day, the average hourly Heat Input Rates, Corrected NO_x emission concentrations, NO_x mass emissions (as NO₂), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined.~~
- ~~(l) On a daily basis, the cumulative total NO_x mass emissions (as NO₂) and cumulative total CO mass emissions, for the previous consecutive twelve-month period for all four sources (S-1, S-2, S-3, and S-4) combined.~~

~~(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)~~

~~**Verification:** The project owner/operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~**AQ-29** To demonstrate compliance with Conditions AQ-20(f), AQ-20(g), AQ-20(h), AQ-24(c) through AQ-24(e), AQ-25(c) through AQ-25(e), and AQ-26, the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM₁₀) mass emissions (including condensable particulate matter), Sulfur Dioxide (SO₂) mass emissions, and sulfuric acid mist (SAM) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates calculated pursuant to Condition AQ-28, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, and Energy Commission and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:~~

- ~~(a) For each calendar day, POC, PM₁₀, SO₂, and SAM emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined) and all four sources (S-1, S-2, S-3, and S-4) combined and~~
- ~~(b) On a daily basis, the 365-day rolling average cumulative total POC, PM₁₀, SO₂, and SAM mass emissions, for all four sources (S-1, S-2, S-3, and S-4) combined.~~

~~(Offsets, PSD, Cumulative Increase)~~

~~**Verification:** The project owner/operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~**AQ-30** To demonstrate compliance with Condition **AQ-27**, the owner/operator shall calculate and maintain records on an annual basis of the maximum projected annual emissions of: Acetaldehyde, Acrolein, Formaldehyde, Benzene, and Specified PAHs. Maximum projected annual emissions shall be calculated using the maximum Heat Input Rate of 34,679,088 MM Btu/year and the highest emission factor (pounds of pollutant per MM Btu of Heat Input) determined by any source test of the S-1 & S-3 Gas Turbines and/or S-2 & S-4 Heat Recovery Steam Generators. (TRMP)~~

~~**Verification:** The project owner/operator shall submit documentation of each of the parameters specified in this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-36**.~~

~~**AQ-31** After start up of the RCEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 to determine the corrected ammonia (NH₃) emission concentration to determine compliance with Condition **AQ-20(e)**. The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-1 or A-2 SCR System ammonia injection rate, and the corresponding NH₃ emission concentration at emission point P-1 or P-2. The source test shall be conducted over the expected operating range of the turbine and HRSG (including, but not limited to minimum, 70%, 85%, and 100% load) to establish the range of ammonia injection rates necessary to achieve NO_x emission reductions while maintaining ammonia slip levels. Continuing compliance with Condition **AQ-20(e)** shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (TRMP)~~

~~**Verification:** Initial source testing shall be completed within sixty (60) days of start-up. No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this Condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within sixty (60) days of the source testing date.~~

~~**AQ-32** After start up of the RCEC and on an annual basis thereafter the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to determine compliance with Conditions **AQ-20(a), (b), (c), (d), (f), (g), and (h)**, while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with Conditions **AQ-20(c) and (d)**, and to verify the accuracy of the continuous emission monitors required in Condition **AQ-27**. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide~~

concentration and mass emissions (as NO₂), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and particulate matter (PM₁₀) emissions including condensable particulate matter. (BACT, offsets)

Verification: Initial source testing shall be completed within sixty (60) days of start-up. No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this Condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within sixty (60) days of the source testing date.

AQ-33 After start-up of the RCEC and on a quarterly basis thereafter, the owner/operator shall conduct a District approved source test on exhaust points P-1 and P-2 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to demonstrate compliance with the SAM levels in Condition **AQ-26**. The owner/operator shall test for (as a minimum) SO₂, SO₃, SAM and ammonium sulfates. After acquiring one year of source test data on these units, the owner/operator may petition the District to switch to annual source testing if test variability is low. (Basis: PSD Avoidance, SAM Periodic Monitoring)

Verification: Initial source testing shall be completed within sixty (60) days of start-up. No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this Condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within sixty (60) days of the source testing date.

AQ-34 After start-up of the RCEC and on an biennial basis (once every two years) thereafter, the owner/operator shall conduct a District approved source test on exhaust point P-1 or P-2 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with Condition **AQ-27**. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to Condition **AQ-30** for any of the compounds listed below are less than the BAAQMD Toxic Risk Management Policy (TRMP) trigger levels shown, then the owner/operator may discontinue future testing for that pollutant:

| | | |
|--------------|---|-----------------|
| Acetaldehyde | ≤ | 72 pounds/year |
| Acrolein | ≤ | 3.9 pounds/year |

| | | |
|----------------|---|------------------|
| Benzene | ≤ | 26.8 pounds/year |
| Formaldehyde | < | 132 pounds/year |
| Specified PAHs | ≤ | 0.18 pounds/year |

Verification: Initial source testing shall be completed within sixty (60) days of start up. No later than twenty (20) working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CPM a detailed source test plan designed to satisfy the requirements of this Condition. The District and the CPM will notify the Owner/Operator of any necessary modifications to the plan within twenty (20) working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CPM comments into the test plan. The Owner/Operator shall notify the District and the CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CPM within sixty (60) days of the source testing date.

AQ-35 The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CPM in writing of the source test protocols and projected test dates at least seven (7) days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM₁₀ emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District and the CPM within sixty (60) days of conducting the tests. (BACT)

Verification: The project owner/operator shall submit documentation of the procedures and results of each source test conducted as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-36**.

AQ-36 The owner/operator of the RCEC shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)

Verification: The project owner/operator shall submit a Quarterly Air Quality Report (QAQR) for the preceding calendar quarter by January 30, April 30, July 30 and October 30 of each year. Each QAQR shall include, but not be limited to, a compliance matrix, a summary of operations activities, and a summary of all reports covered by this Condition. The January 30 report for each year shall include an annual summary of the four Quarterly Air Quality Reports covering the preceding calendar year. The reports shall be submitted to the California Energy Commission Compliance project Manager (CPM).

~~**AQ-37** The owner/operator of the RCEC shall maintain all records and reports on site for a minimum of five (5) years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CPM Staff upon request. (Regulation 2-6-501)~~

~~**Verification:** The project owner/operator shall maintain a copy of each Quarterly Air Quality Report on site for a minimum of five (5) years.~~

~~**AQ-38** The owner/operator of the RCEC shall notify the District and the CPM of any violations of these permit Conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit Condition. (Regulation 2-1-403)~~

~~**Verification:** The owner/operator shall include a compliance matrix in the Quarterly Air Quality Report required by the verification of Condition **AQ-36**. The Compliance Matrix shall summarize the project's compliance status for each Condition during the reporting period.~~

~~**AQ-39** The owner/operator shall install the exhaust stacks (P-1 and P-2) that are at least 145 feet above grade level from the stack base. (PSD, TRMP)~~

~~**Verification:** Prior to the first firing of natural gas in either turbine the owner/operator shall provide as built drawings of the stack or other suitable proof of the minimum stack height to the District and the CPM.~~

~~**AQ-40** The owner/operator of the RCEC shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Regulation 1-501)~~

~~**Verification:** Prior to the first firing of natural gas in either turbine the owner/operator shall provide as built drawings or other suitable proof of compliance with this Condition of Certification to the District and the CPM.~~

~~**AQ-41** Within 180 days of the issuance of the Authority to Construct for the RCEC, the owner/operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous monitors, sampling ports, platforms, and source tests required by Conditions **AQ-28**, **AQ-31**, **AQ-32**, **AQ-33**, **AQ-34** and **AQ-48**. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Regulation 1-501)~~

~~**Verification:** The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-36**.~~

~~**AQ-42** Prior to the issuance of the BAAQMD Authority to Construct for the RCEC, the owner/operator shall provide to the District valid emission reduction credit banking certificates in the amount of 154.8 tons/year of Nitrogen Oxides and 27.8 tons/year of Precursor Organic Compounds or equivalent as defined by District Regulations 2-2-302.1 and 2-2-302.2. (Offsets)~~

~~**Verification:** The project owner/operator must submit all ERC documentation to the District and the CPM prior to the issuance of the BAAQMD Authority to Construct.~~

~~**AQ-43** Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of the RCEC shall submit an application to the BAAQMD for a major facility review permit within 12 months of the issuance of the PSD Permit. (Regulation 2-6-404.1)~~

~~**Verification:** The owner/operator shall notify the CPM within ten (10) working days of any application for, issuance of, and/or modification to any permit pertaining to air quality.~~

~~**AQ-44** Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the RCEC shall not operate either of the gas turbines until either: 1) a Title IV Operating Permit has been issued; 2) 24 months after a Title IV Operating Permit Application has been submitted, whichever is earlier. (Regulation 2, Rule 7)~~

~~**Verification:** The owner/operator shall notify the CPM within ten (10) working days of any application for, issuance of, and/or modification to any permit pertaining to air quality.~~

~~**AQ-45** The owner/operate of the RCEC shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Regulation 2, Rule 7)~~

~~**Verification:** The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-36**.~~

~~**AQ-46** The owner/operator shall take monthly samples of the natural gas at the RCEC facility. The samples shall be analyzed for sulfur content using District-approved laboratory methods or the owner/operator shall obtain certified analytical results from the gas supplier. The sulfur content test results shall retain records on site for a minimum of five years from the test date and shall be utilized to satisfy the requirements of 40 CFR Part 60, subpart GG. (cumulative increase)~~

~~**Verification:** The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition **AQ-36**.~~

~~**AQ-47** The owner/operator shall install and maintain the high efficiency mist eliminators with a maximum guaranteed drift rate of at least 0.0005 percent such that S-5 Cooling Tower minimizes the drift losses. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the~~

~~wastewater facility shall not be higher than 2,000 ppmw (mg/l). The owner/operator shall sample the water at least once per day. (PSD)~~

~~**Verification:** The project owner/operator shall submit documentation of compliance with this Condition of Certification, including a summary of all data collected in relation to this Condition, as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~**AQ-48** The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components that are broken or missing. Prior to the initial operation of the Russell City Energy Center, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in a satisfactory manner. Within sixty (60) days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM₁₀ emission rate from the cooling tower to verify compliance with the vendor guaranteed drift rate specified in Condition AQ-47. The CPM may, in years five (5) and fifteen (15) of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor guaranteed drift rate specified in Condition AQ-47. (PSD)~~

~~**Verification:** The project owner/operator shall submit documentation of compliance with this Condition of Certification, including color photographs, as part of the January Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~**AQ-49** The owner/operator shall fire the S-6 Emergency Generator exclusively on natural gas. (Toxics, Cumulative Increase).~~

~~**Verification:** The project owner/operator shall include documentation of natural gas fuel use of the S-6 Emergency Generator as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~**AQ-50** The owner/operator shall operate the S-6 Emergency Generator for no more than 100 hours per year for the purpose of reliability testing or in anticipation of imminent emergency Conditions. Emergency Conditions are: (1) Failure of a regular power supply, or (2) involuntary curtailment of a power supply (where the utility that provides regular power has been instructed by the ISO to shed firm load, or where the utility has actually shed firm load). (Cumulative Increase)~~

~~**Verification:** The project owner/operator shall submit documentation of compliance with this Condition of Certification as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~**AQ-51** The owner/operator equip the S-6 Emergency Generator with a non-resettable totalizing counter that records hours of operation. (BACT)~~

~~**Verification:** The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and Energy Commission.~~

~~AQ-52 The owner/operator shall maintain the following monthly records in a District-approved log for at least 5 years and shall be made available to the District upon request: (BACT)~~

- ~~a. Total number of hours of operation for S-6 Emergency Generator~~
- ~~b. Fuel usage at S-6 Emergency Generator~~

~~**Verification:** The project owner/operator shall submit documentation of S-6 Emergency Generator hours of operation and fuel use as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~AQ-53 The owner/operator shall fire the S-7 Fire Pump Engine exclusively on diesel fuel having a sulfur content no greater than 0.05 percent by weight. (Toxics, Cumulative Increase)~~

~~**Verification:** The project owner/operator shall submit documentation S-7 Fire Pump Engine diesel fuel use and sulfur content certification as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~AQ-54 The owner/operator shall operate the S-7 Fire Pump Engine for no more than 30 hours per year for the purpose of reliability testing and non-emergency operation. (Toxics)~~

~~**Verification:** The project owner/operator shall submit documentation S-7 Fire Pump Engine hours of operation as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~AQ-55 The owner/operator shall equip the S-7 Fire Pump Engine with a non-resettable totalizing counter that records hours of operation. (BACT)~~

~~**Verification:** The project owner/operator shall make the project site available for inspection at any time by representatives of the District, ARB, USEPA and Energy Commission.~~

~~AQ-56 The owner/operator shall maintain the following monthly records in a District-approved log for at least five (5) years and shall make such records readily available for District inspection upon request: (BACT)~~

- ~~a. Total number of hours of operation for S-7 Fire Pump Engine~~
- ~~b. Fuel usage at S-7 Fire Pump Engine~~

~~**Verification:** The project owner/operator shall submit documentation of S-7 Fire Pump Engine hours of operation and fuel use as part of the Quarterly Air Quality Report required by the verification of Condition AQ-36.~~

~~AQ-57 The project owner/operator shall submit a copy of any proposed modifications to the Authority to Construct and/or Permit to Operate issued by the district, and shall provide a written description of any other air quality related permit modification to the CPM for review and approval.~~

~~If the CPM concurs with the process undertaken by, and the decision of, the local air district or other agency concerning any permit modifications, no Energy Commission action (amendment) will be required.~~

~~**Verification:** The project owner/operator shall submit a copy of any request to modify the local air district permits within five (5) days of filing the requested modification to the CPM. The project owner/operator shall provide a written description of any other proposed modification within ten (10) days to the CPM.~~

~~**AQ-58** The project owner/operator shall fully implement the PM₁₀ Mitigation Plan in cooperation with the Bay Area Air Quality Management District as outlined in the Amended PM₁₀ Mitigation Plan prepared by the Applicant and docketed on April 5th, 2001. All retrofits and replacements shall be completed within twenty-four (24) months of commencement of first turbine roll.~~

~~**Verification:** The project owner/operator shall submit a PM₁₀ Mitigation Progress Report as a part of each Quarterly Air Quality Report required by the verification of Condition **AQ-36**. Once all required emissions efforts have been completed, the Applicant shall submit a Final PM₁₀ Mitigation Report within sixty (60) days. The report shall provide detailed documentation of the entire mitigation effort including, but not limited to, funds spent and the exact number of fireplaces and wood stoves retrofit/replaced.~~

REFERENCES

AD 2006a – AD/G. Darwin (tn: 38535). Cover letter and CD for Modeling file for the Russell City Energy Center. 11/21/2006. Rec'd 12/04/2006.

BAAQMD 2007 - Bay Area Air Quality Management District. Notice Inviting Written Public Comment. 04/02/2007.

CEC 2001a – Calpine Corp./Hildebrand (tn: 20373). Application for Certification.

CEC 2002a – California Energy Commission (tn: 26086). Final Staff Assessment.

CEC 2002b –California Energy Commission/Commissioners (tn:26635). Commission Decision for Russell City - POS.

CEC 2006a – California Energy Commission/J.Z. Scott (tn: 38766). Russell City Energy Center Amendment Data Requests. 12/22/2006. Rec'd 12/22/2006.

CH2MHILL 2007a – CH2MHILL/D.M. Davy (tn: 38948). project owner's Responses to Staff Data Requests 1-52. Cover letter docketed, transmittal letter, and attached POS. 01/17/2007. Rec'd 01/17/2007.

RC 2006a – Russell City/M. Hartfield (tn: 38410). Petition for Amendment NO. 1, Russell City Energy Center.

AD 2007a – AD/G. Darwin. SOx/PM10 Offset Ratio Analysis. E-mail dated 5/4/2007.

AIR QUALITY APPENDIX 1

STAFF ESTIMATES OF THE RUSSELL CITY ENERGY CENTER EMISSIONS

Information provided by the project owner

1. Turbine's start up and shut down emissions (Appendix 3.1A, Table 3.1A-5):

| Per turbine, per event | Cold Start | Warm Start | Hot Start | Shut Down |
|------------------------|------------|------------|-----------|-----------|
| NOx (pounds) | 480 | 240 | 240 | 80 |
| VOC (pounds) | 96 | 48 | 48 | 16 |
| CO (pounds) | 5,028 | 2,514 | 2,514 | 902 |
| Duration (hour) | 6 | 3 | 3 | 0.5 |

2. Turbine's normal operation (Table 3.1-3, Appendix 3.1A, Table 3.1A-4):

| | Exhaust Gas Concentration (ppm) | Hourly per turbine lbs/hr | Daily both turbines lbs/day | Annual ton/yr |
|------------|---------------------------------|---------------------------|-----------------------------|---------------|
| NOx | 2.0 | 16.17 (ea.) | 1,542.2 | 134.52 |
| VOC | 1.0 | 2.82 | 293.6 | 27.78 |
| CO | 4.0 | 19.69 | 10,764.8 | 584.18 |
| SOx | | 6.2 | 297.6 | 12.2 |
| PM10/PM2.5 | | 9 | 432 | 74.68 |

3. Facility operating schedule would be 24 hours/day, 7 days/week, and 8,364 hours/year per turbine (RCEC 2007, pp. 3-5).
4. Facility estimated start up and shut down events would be one cold and on hot starts, two shut downs for each turbine per day. The maximum number of start up and shut down event would be about 104 cold and 520 hot starts and 614 shut downs a year (RCEC, 2007a, Table DR4-1).
5. ERCs provided

| Company | Location | Cert.# | NOx (TPY) | VOC(TPY) | PM10(TPY) |
|--------------|---------------|--------|----------------------|----------|-----------|
| PG&E | San Francisco | 855 | 53.11 | | |
| Pacific Ref. | Hercules | 815 | 49.864 | 28.5 | |
| | | | 51.825 (VOC for NOx) | | |
| Total | | | 154.8 | 28.5 | |

Staff Estimates

1. Facility's operational profile

According to the project owner, each turbine can go through one cold, one hot, two shut down events, and the rest are normal operation. Thus for every 24 hour period, each turbine can experience 9 hours of start up (6 hours for cold and 3 hours for hot) and 1 hour of shut down (0.5 hour each). The normal hours of operation would be 14 hours.

On the annual basis, each turbine can go through 52 cold, 260 hot start-ups and 312 shutdown. Thus each year, the start up and shut down hours for each turbine are:

$$= 52(6\text{hr}) + 260(3\text{hr}) + 312(0.5\text{hr}) = 1,248 \text{ hours}$$

This leaves approximate 7,116 hours [(8,364 hours - 1,248 hours)] of normal steady state operation.

2. Facility's potential emissions

On a daily basis

$$\text{NOx} = 2 \text{ turbines} [1 \text{ cold}(480) + 1 \text{ hot}(240) + 2 \text{ SD}(80) + 14 \text{ hr}(16.17)] \\ = 2,213 \text{ lbs/day}$$

$$\text{VOC} = 2 [1(96) + 1(48) + 2(16) + 14(2.82)] = 431 \text{ lbs/day}$$

$$\text{CO} = 2 [1(5,028) + 1(2,514) + 2(902) + 14(19.69)] = 19,603 \text{ lbs/day}$$

$$\text{PM}_{10} = 24\text{hrs}[2(9 \text{ lbs/hr}) + 2.83^{\text{a}} \text{ lbs/hr}] = 500 \text{ lbs/day}$$

$$\text{SOx} = 24\text{hrs}[(4.38\text{E}6 \text{ scf} (1\text{gr}^{\text{b}}/100\text{scf})/7000\text{gr/lbs}) (64/32)] = 300 \text{ lbs/day}$$

Notes:

- a. Cooling tower PM₁₀ emissions.
- b. Staff estimates the facility's potential daily SO_x emissions using the maximum 1 grain/100 scf sulfur content natural gas, and assumed full conversion of sulfur to sulfur dioxide.

On an annual basis

$$\text{NOx} = 2 \text{ turbines} [52\text{cold}(480) + 260\text{hot}(240) + 312\text{SD}(80) + 7116\text{hrs}(16.17)] \\ = 454,771 \text{ lbs/yr or } 227.4 \text{ TPY}$$

$$\text{VOC} = 2[52(96) + 260(48) + 312(16) + 7116(2.82)] = 85,062 \text{ lbs or } 42.5 \text{ TPY}$$

$$\text{CO} = 2[52(5,208) + 260(2,514) + 312(902) + 7116(19.69)] = 2,691,988 \text{ lbs} \\ \text{or } 1,346 \text{ TPY}$$

$$\text{PM}_{10}/\text{PM}_{2.5} = 8364\text{hrs}[2(9) + 2.83] = 174,222 \text{ lbs or } 87.1 \text{ TPY}$$

$$\text{SOx} = 8364\text{hrs}[4.38\text{E}6(0.25\text{gr}/100)/7000](64/32) = 26,167 \text{ lbs or } 13.08 \text{ TPY}$$

3. Facility probable maximum daily emissions

Staff believes that the facility's estimated potential emissions (see above) would rarely happen in practice. For both gas turbines to undergo a sequence of a cold start-up, a shutdown, a hot re-start, operate for a few hours, then shut down again would require the facility to have breakdown immediately after restarting from an extended outage for maintenance. Staff explored the most probable daily emissions of ozone precursor emissions at the facility.

According to data from the project owner and operational data collected from other facilities currently in operation, staff found the following scenario to be the most probable operational profile for the RCEC facility. The facility would have a hot start in the morning, operate normally for about 14 hours and then shut down overnight. If this is the case, the facility's ozone precursors emissions would be calculated as:

$$\text{NOx} = 2 \text{ turbines } [1 \text{ hot}(240) + 1 \text{ SD}(80) + 14 \text{ hr}(16.17)] \\ = 1,093 \text{ lbs/day}$$

$$\text{VOC} = 2 [1(48) + 1(16) + 14(2.82)] = 207 \text{ lbs/day}$$

4. What if the facility were built with GE Rapid Start process (see Victorville 2 Hybrid (07-AFC-1))?

The Victorville 2 Hybrid Power project is proposed to be built with GE turbines employing Rapid Start process. The start-up and shutdown NOx emissions guaranteed for the combustion turbines are 96 lbs per cold start-up, 40 lbs per hot start-up and 57 lbs per shutdown. Using these data, the RCEC worst case turbine/HRSG emissions would be:

$$\text{NOx} = 2 \text{ turbines } [1 \text{ cold}(96) + 1 \text{ hot}(40) + 2 \text{ SD}(57) + 14 \text{ hr}(16.17)] \\ = 950 \text{ lbs/day}$$

5. What if the facility were built with Siemens-Westinghouse Benson Once Through Boiler (see City of Vernon (06-AFC-1))?

The City of Vernon Power project is proposed to be built with Siemens-Westinghouse 501FD turbines employing the Benson Once-through boiler. The start-up and shutdown emissions guarantee for the combustion turbines NOx emissions are 21.6 lbs per cold start-up, 28 lbs per hot start-up and 22 lbs per shutdown. Using these data, the RCEC worst case turbine/HRSG emissions would be:

$$\text{NOx} = 2 \text{ turbines } [1 \text{ cold}(21.6) + 1 \text{ hot}(28) + 2 \text{ SD}(22) + 14 \text{ hr}(16.17)] \\ = 640 \text{ lbs/day}$$

$$\text{VOC} = 2 \text{ turbines } [1 \text{ cold}(20.5) + 1 \text{ hot}(32) + 2 \text{ SD}(10) + 14 \text{ hr}(2.82)] \\ = 223 \text{ lbs/day}$$

Most probable case

$$\text{NOx} = 2 \text{ turbines } [1 \text{ hot}(32) + 1 \text{ SD}(10) + 14 \text{ hr}(2.82)] \\ = 163 \text{ lbs/day}$$

AIR QUALITY APPENDIX 2

STAFF ESTIMATES OF SOX TO PM10 TRADING RATIO

The project owner has provided staff with an analysis to support their proposed interpollutant trading ratio of 3 lbs of SOx to mitigate each new pound of PM10 emissions from the RCEC facility (AD-2007a). In this analysis, the project owner used a combination of measured and interpolated ambient concentration data of PM10 and its sulfates components in Fremont to derive an estimated interpollutant trading ratio ranging from of 6.37 to 8.11 SOx for every pound of PM10.

Believing that the ratio range derived for Fremont data was too high, the project owner attempted to determine a ratio that is representative for the whole surrounding area including Concord, Livermore and San Jose. Again using a combination of measured and interpolated ambient concentration data, the project owner derived an estimated ratio of 3.08 lbs of SOx for every new pound of PM10.

Staff does not believe that the analysis submitted by the project owner is accurate in representing the ambient conditions in the region because many of the ambient data used in the analysis are not measured data but interpolated data. Therefore, staff searched for additional measured data and attempt to replicate the project owner analysis to find a representative trading ratio of SOx for PM10. The staff method of analysis is identical to that submitted by the project owner (see AD-2007a), but the PM10 sulfate data points are based on actual ambient concentrations measured at Concord, San Pablo and San Francisco air monitoring stations. Staff calculations of the SOx for PM10 interpollutant trading ratio using actual measured data are show below in AIR QUALITY Appendix 2 Table 1.

AIR QUALITY Appendix 2 Table 1
SO₂:PM10 Emissions Trade-Off Ratios Using Data Measured on 12-7-06

| Site | Total SO _x ug/m ³ as SO ₂ | (NH ₄) ₂ SO ₄ ug/m ³ | (NH ₄) ₂ SO ₄ 2H ₂ O ug/m ³ | Range of Computed Trade-Off Ratios | Best Estimate |
|---------------------|---|--|--|--|------------------|
| San Pablo | 12.094 | 1.38 | 1.75 | 6.91:1 to 8.76:1 | 7.84:1 |
| San Francisco | 18.543 | 2.99 | 3.67 | 5.05:1 to 6.40:1 | 5.73:1 |
| Concord | 3.526 | 1.38 | 1.75 | 2.01:1 to 2.56:1 | 2.29:1 |
| Area Average | | | | 4.66:1 to 5.91:1 | 5.30:1 |

Source: project owner's SOx to PM10 analysis (AD-2007a)

Staff's analysis shows that if the actual measured data were used, then the range of interpollutant trading ratios of SOx for PM10 is 4.66:1 to 5.91:1, which yields an average interpollutant trading ratio of 5.30:1.

Mr Simpson;

I don't recall the specifics of our conversation you mention below. I do recall telling you that we don't release certain lists due to privacy concerns.

However, given that you have several requests regarding Russell City Energy Center, and site specific legal statutes in doing so, please refer your requests to the Energy Commission's legal counsel for this case, Mr. Dick Ratliff. He can be reached at Dratliff@energy.state.ca.us.

I'm sorry I can't help you.

Sincerely,

Mike

Mike Monasmith
Associate Public Adviser
California Energy Commission
916-654-4489 -- phone
916-654-4493 -- fax

>>> "Grandview Realty" <GrandviewRealty@comcast.net> 10/15/2007 11:37 AM >>>

Dear Mr. Monasmith,

I have received no information.

We also spoke about the public notice records and you informed me that you could not provide them to me for privacy reasons and that notice was made only within 1000 feet of the actual facility not the associated power lines. Again I ask for these records. They were "public notice" ostensibly derived through "public records" and should be available without reservation.

It would appear that the transmission lines constitute a "transmission corridor Zone" consistent with section 25330 et al of the Warren-Alquist act and would require notice. Is this correct? Is this process considered the application for the transmission corridor zone or will there be another application?

It would appear that the project was justified based upon the demand at the time of the original filling. Is this the "most recent forecast" as required for certification or has the demand for the project been reassessed? If it has can you demonstrate the context?

§ 25500.5. Certifications sufficient to accommodate projected demand

The commission shall certify sufficient sites and related facilities which are required to provide a supply of electric power sufficient to accommodate the demand projected in the **most recent forecast** of statewide and service area electric power demands adopted pursuant to subdivision (b) of Section 25309.

I have not been able to find the regulation regarding the 1000 foot notice. Can you provide this information?

Time is of the essence.

Thank you,

Rob Simpson

510-909-1800

From: Mike Monasmith [mailto:Mmonasmi@energy.state.ca.us]

Sent: Thursday, October 11, 2007 4:28 PM

To: grandviewrealty@comcast.net

Subject: agency list for RCEC

Hi Rob,

We spoke earlier about the Russell City Energy Center (RCEC) agency outreach list. I put the list request into the project manager in compliance (where this case now resides here at the Commission, as it was approved by the Commissioners 2 weeks ago):

<http://www.energy.ca.gov/2007publications/CEC-800-2007-003/CEC-800-2007-003-CMF.PDF>

You should receive something tomorrow (Friday).

Thanks for your patience.

Sincerely,

Mike Monasmith

Associate Public Adviser

California Energy Commission

916-654-4489 -- phone

916-654-4493 -- fax

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.488 / Virus Database: 269.14.8/1063 - Release Date: 10/11/2007 9:11 AM

No virus found in this outgoing message.

Checked by AVG Free Edition.

Version: 7.5.488 / Virus Database: 269.14.11/1071 - Release Date: 10/15/2007 6:48 AM

No virus found in this incoming message.

Checked by AVG Free Edition.

Version: 7.5.488 / Virus Database: 269.14.11/1071 - Release Date: 10/15/2007 6:48 AM

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

Amendment to the APPLICATION
FOR CERTIFICATION OF THE
RUSSELL ENERGY CENTER
POWER PLANT PROJECT

Docket No. 01-AFC-7C
PROOF OF SERVICE
(Revised 7/6/07)

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

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 01-AFC-7C
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

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DECLARATION OF SERVICE

I, Lynn Tien-Tran, declare that on October 31, 2007, I deposited copies of the attached COMMISSION STAFF RESPONSE TO PETITIONS FOR RECONSIDERATION AND INTERVENTION and ATTACHMENT 1 & 2 to the Russell City Energy POS List in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

Transmitted via facsimile transmission to those identified above with a Fax number.

OR

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

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



Lynn Tien-Tran



| Log # | Dated | To | From | Subject | Pages |
|--------------|-------------------|---------------------------|---|--|--------------|
| 26634 | 9 / 11 / 02 | Dockets | CEC | Notice of Availability of the Commission Decision for the AFC Russell City | 1 |
| 26635 | 9 / 11 / 02 | CEC / Dockets | CEC / Keese / Pernell / Fay | Commission Decision for Russell City - POS | 310 |
| 26638 | 9 / 11 / 02 | Dockets | CEC / Caswell | Notice of Determination for Russell City | 4 |
| 26612 | 9 / 6 / 02 | CEC / Bartridge / Dockets | Downey Brand Seymour and Rohwer / Luckhardt | Biological Issues Summary POS | 22 |
| 26573 | 8 / 29 / 02 | CEC / Dockets | Beckman | Public comments | 2 |
| 26541 | 8 / 27 / 02 | CEC / Fay / Dockets | CEC / Ratliff | Comments on PMPD - Language for Conditions re: Site Monitoring for PM 10 - POS | 5 |
| 26567 | 8 / 24 / 02 | CEC / Keese / Dockets | Ohlone Aubudon Society / Delfino | Response to the RCEC Application for Certification | 2 |
| 26522 | 8 / | Dockets | CEC / Flores / | Resumes and | 7 |

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| | 22 / 02 | | York / Behymer | Declarations | |
| 26493 | 8 / 19 / 02 | CEC / Dockets | CEC / Keese / Pernell | Notice of Commission Hearing re: Presiding Member's Proposed Decision - 9 / 11 / 02 - CEC - POS | 5 |
| 26467 | 8 / 16 / 02 | CEC / Keese / Pernell / Dockets | CEC / Caswell | Comments on the Presiding Member's Proposed Decision -POS | 7 |
| 26456 | 8 / 16 / 02 | CEC / Dockets | Ellsion, Schneider \$ Harris / Wheatland | Applicant's Comments on Presiding Member's Proposed Decision - POS | 6 |
| 26492 | 8 / 14 / 02 | CEC / Dockets | CEC / Commissioners | Commission Order Denying Woman's Energy Matters Petition for Review - POS | 5 |
| 26431 | 8 / 12 / 02 | CEC / Dockets | CEC / Aichien | Staff's Statement in Support of Committee Order - POS | 6 |
| 26397 | 8 / 7 / 02 | CEC / Dockets | Ellison, Schneider and Harris / Wheatland | Opposition to the Petition for Reconsideration by Women's Energy Matters - POS | 7 |
| 26407 | 7 / 31 / 02 | CEC / Dockets | CEC / Keese / Pernell | Presiding Member's Proposed Decision #P800- | 300 |

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| 26340 | 7 / 31 / 02 | All Parties / Dockets | CEC / Read | Notice and Notice of Committee Conference for the Presiding Member's Proposed Decision POS | 6 |
| 26411 | 7 / 31 / 02 | CEC / Dockets | CEC / Keese / Pernell | Recommendation of Approval- Presiding Member's Proposed Decision | 1 |
| 26339 | 7 / 31 / 02 | CEC / Dockets | CEC / Keese / Pernell | Notice of Availability of Presiding Member's Proposed Decision and Notice of Committee Conference - POS | 5 |
| 26252 | 7 / 23 / 02 | CEC / Dockets | CEC / Keese / Pernell | Committee Order Denying Petition for Consideration and Notice of Hearing for Full Commission Review POS | 6 |
| 26250 | 7 / 23 / 02 | CEC / Dockets | CEC / Ichien / Ratliff | Bio-10 POS | 6 |
| 26182 | 7 / 15 / 02 | CEC / Dockets | Howard Perry Beckman / Beckman | Comments | 4 |
| 26177 | 7 / 10 / 02 | CEC / Dockets | Women's Energy Matters / George | Petition for Reconsideration of Energy Commission | 14 |

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| | | | | Committee Order by The Full Commission and Memorandum of Points and Authorities in Suppo | |
| 26158 | 7 / 10 / 02 | CEC / Dockets | Women's Energy Matters / George | Petition for Reconsideration of Energy Commission Committee Order by the Full Commission | 9 |
| 26140 | 7 / 10 / 02 | CEC / Dockets | CEC / Ratliff | Staff Brief - POS | 10 |
| 26125 | 7 / 10 / 02 | CEC / Dockets | Ellison Schneider & Harris / Wheatland | Post-Hearing Brief of Russell City Energy Center - POS | 244 |
| 26156 | 7 / 9 / 02 | CEC / Dockets | Energy Resorces | Hearing Notice and Committee Revised Scheduling Order | 3 |
| 26109 | 7 / 8 / 02 | CEC / Dockets | E. Cormier | Alternatives Energy Sources | 3 |
| 26057 | 7 / 1 / 02 | CEC / Dockets | Ellison Schneider & Harris / Wheatland | Proposed Exhibit List for Russell City - POS | 6 |
| 26157 | 6 / 20 / 02 | CEC / Dockets | Energy Resources | Evidentiary Hearing | 34 |
| 25991 | 6 / 20 / 02 | CEC / Dockets | Russell City Energy Center | Sign In Sheet for Evidentiary Hearing on June 20, 2002 | 2 |
| 25976 | 6 / 19 / 02 | CEC / Dockets | Rehon and Roberts | Opposition of Intervenor Parker Ventures LLC to | 5 |

| | | | | Applicant's Motion to Strike POS | |
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| 26034 | 6 / 19 / 02 | CEC / Keese / Dockets | Hawyard Area Shoreline Planning Agency / Hilson | Letter of support | 2 |
| 26037 | 6 / 19 / 02 | CEC / DOcketts | Women's Energy Matters / George | Petition to Intervene- Women's Energy Matters | 2 |
| 25960 | 6 / 19 / 02 | CEC / Dockets | Rehon & Roberts / Delany | Opposition of Intervenor Parker Ventures LLC to Applicant's Motion to Strike - POS | 5 |
| 25949 | 6 / 18 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Addendum to Testimony, Errata, and Comments on the Final Staff Assessment for Russell City - POS | 36 |
| 25939 | 6 / 13 / 02 | CEC / Dockets | Rehon and Roberts / Rehon | Statement of Intervenor Parker Ventures LLC Regarding Documents Which May be Introduced as Evidence POS | 4 |
| 25974 | 6 / 13 / 02 | CEC / Caswell / Dockets | Rehon and Roberts / Roberts | Statement of Intervenor Parker Ventures LLC Regarding Documents Which May Be Introduced as Evidence POS | 68 |

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| 25907 | 6 / 10 / 02 | CEC / Dockets | Parker Ventures Limited Liability Co. / Roberts | Statement of Intervenor Parker Ventures LLC Summarizing Witness Qualification and Testimony - POS | 6 |
| 25856 | 6 / 10 / 02 | CEC / Librarian / Dockets | CEC / Richins | Document Handling FSA | 1 |
| 25857 | 6 / 10 / 02 | Agency Distribution List | CEC / Richins | Final Staff Assessment Letter | 1 |
| 25855 | 6 / 10 / 02 | CEC / Dockets | CEC / Richins | Notice of Availability Final Staff Assessment POS | 5 |
| 25840 | 6 / 7 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Testimony in Support of the Application for Certification POS | 117 |
| 25695 | 5 / 22 / 02 | CEC / Dockets | CEC / Pernell / Keese | Notice of Evidentiary Hearings POS | 8 |
| 25626 | 5 / 15 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Revised Project Description and Wetland Mitigation Plan - POS | 54 |
| 25493 | 5 / 6 / 02 | CEC / Keese / Pernell / Dockets | CEC / Caswell | Status Report - POS | 5 |
| 25491 | 5 / 6 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Amendment to Federal Aviation Administration Notice of Proposed Construction or Alteration - POS | 18 |
| 25490 | 5 / 6 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Environmental Assessment of | 97 |

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| 25474 | 4 / 30 / 02 | CEC / Dockets | Russell Energy Center | Additional information Pile Driver Noise Mitigation Predator Pech Deterrent and Monitoring Plan Visual Resources | 19 |
| 25463 | 4 / 30 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Additional Information: Pile Driver Noise Mitigation - Predator Perch Deterrent & Monitoring Plan - Visual Resources Mitigation | 30 |
| 25413 | 4 / 25 / 02 | CEC / Dockets | CEC / Keese / Pernell | Notice of Committee Scheduling Conference and Order Granting Request for Conversion to 12-month Process POS | 6 |
| 25307 | 4 / 16 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Additional Information POS | 13 |
| 25292 | 4 / 15 / 02 | CEC / Dockets | Ellison Schneider and Harris / Wheatland | Russell City Energy Center Status Report #3 and Request for Conversion to a 12-month Proceeding POS | 11 |
| 25145 | 4 / 5 / | CEC / Caswell / | Calpine / Leahy | PM 10 Mitigation | 14 |

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| | 02 | Dockets | | Plan - Amendments to the Visual Plan Measures 2 & 3 - POS | |
| 25113 | 3 / 29 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Additional Information - Predator Perching Deterrent and Monitoring Plan - Construction Noise Mitigation - POS | 22 |
| 25100 | 3 / 26 / 02 | CEC / Keese / Pernell / Dockets | CEC / Caswell | Status Report - #2 | 48 |
| 25029 | 3 / 20 / 02 | Utility System Efficiencies / Daschmans / CEC / Dockets | California ISO / Tobias | RCEC Conference Call 3 / 20 / 02 - Participation Request | 2 |
| 24977 | 3 / 19 / 02 | CEC / Dockets | CEC / Read | New Proof of Service | 4 |
| 25017 | 3 / 18 / 02 | CEC / Lewis / Dockets | BAAQMD / Garvey | Final Determination of Compliance - BACT and Emission Offset Requirement | 68 |
| 24962 | 3 / 14 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Comments on KFAX Radio Tower Relocation Environmental Analysis Report - POS | 13 |
| 25020 | 3 / 13 / 02 | CEC / Cawell / Dockets | Calpine / Leahy | Transmission System Engineering | 4 |
| 24907 | 3 / 13 / 02 | CEC / Caswell / Dockets | Calpine / Leahy | Transmission System Engineering - | 6 |

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| 24901 | 3 / 7 / 02 | CEC / McCuen / Dockets | PG&E / Daniels | General Transmission Planning Issues - POS | 18 |
| 24635 | 2 / 22 / 02 | CEC / Dockets | City of Hayward / Armas | Comments regarding the CEC Radio Tower Relocation Environmental Analysis POS | 5 |
| 24998 | 2 / 15 / 02 | PG&E / Daniels / CEC / Dockets | Calpine / Brown | Facilities Study Agreement and Study Fee for Russell City Energy Center Project - POS | 2 |
| 24557 | 2 / 14 / 02 | CEC / Dockets | CEC | Sign In Sheet Biological Resources Workshop | 3 |
| 25762 | 2 / 14 / 02 | CEC / Dockets | Argonaut Consulting | Agreement Between Russell City Energy LLC and the Easy Bay Regional Park District POS | 9 |
| 24636 | 2 / 13 / 02 | CEC / Lewis / Dockets | Pacific Gas and Electric / Daniels | Regarding Staff Assessment | 5 |
| 24460 | 2 / 8 / 02 | CEC / Lewis / Dockets | Ohlone Aubudone Society / Delfino | Letter to Douglas Davy, Foster Wheeler Environmental Corporation re: Revised Mitigation Plan POS | 5 |
| 24461 | 2 / 5 / 02 | CEC / Dockets | CEC / Richins | Request for Review of Energy Commission's Staff's Draft | 20 |

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| | | | | KFAX Radio Tower Relocation Analysis-25 page Draft included | |
| 24397 | 2 / 5 / 02 | CEC / Dockets | CEC / Richins | Request for review of the Energy Commission Staff's Draft KFAX Radio Tower Relocation Analysis POS | 5 |
| 24999 | 2 / 4 / 02 | CEC / Dockets | PG&E | Facilities Study - Study Plan Final | 12 |
| 24295 | 1 / 31 / 02 | CEC / Dockets | CEC / Keese | Workshop Notice Biological Resources for 2 / 14 / 2002 POS | 7 |
| 24332 | 1 / 31 / 02 | CEC / Lewis / Dockets | Calpine / Grenier | Revised Mitigation Plans and Additional Information POS | 107 |
| 24396 | 1 / 30 / 02 | CEC / Dockets | Harvell | Letter of support | 1 |
| 24358 | 1 / 28 / 02 | CEC / Lewis / Dockets | San Francisco Bay Conservation & Dev. Commission / L | Request for information about the status and location of Russell City Energy Center | 2 |
| 24142 | 1 / 22 / 02 | CEC / Lewis / Dockets | City of Hayward / Armas | Comments regarding Staff Assessment | 15 |
| 24205 | 1 / 8 / 02 | CEC / Dockets | Russell City | Biological Resources Workshop Notice | 4 |
| 23786 | 1 / 2 / 02 | CEC / Fay / Dockets | Beckman | Certification Process | 1 |
| 23784 | 12 / 28 / | CEC / Lewis / Dockets | Delfino | Letter of Concern | 2 |

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| 23718 | 12 / 28 / 01 | CEC / Dockets | CEC / Keese / Pernell | Notice of Committee Scheduling Conference - 1 / 14 / 02 - CEC | 2 |
| 23721 | 12 / 28 / 01 | CEC / Dockets | CEC / Keese | Workshop Notice - Biological Resources Workshop - 1 / 8 / 02 - CEC - POS | 5 |
| 23698 | 12 / 26 / 01 | CEC / Keese / Pernell / Dockets | Calpine / Thomas | Change in Parent Company | 3 |
| 23649 | 12 / 21 / 01 | CEC / Lewis / Dockets | Capline / Grenier | Mitigation Plans - POS | 83 |
| 23785 | 12 / 19 / 01 | BAAQMDGarvey / CEC / Dockets | US EPA / Rios | Preliminary Determination of Compliance | 4 |
| 23356 | 12 / 6 / 01 | CEC / Dockets | CEC | CEC Committee Hearing on Revised Scheduling Order | 2 |
| 23693 | 12 / 5 / 01 | CEC / Lewis / Dockets | Junge | Letter expressing concerns about the KFAQ Radio Tower relocation POS | 14 |
| 23410 | 12 / 4 / 01 | CEC / Dockets | CEC | Russell City Energy Center Workshop Notice Project Mailing List - Staff Assessment | 3 |
| 23515 | 12 / 4 / 01 | CEC / Dockets | Russell City Energy Center | Sign-In-Sheet Public and Agency Comment Form- Charlie Cameron | 6 |
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| 23544 | 12 / 4 / 01 | CEC / Lewis / Dockets | California Regional Water Quality Control Board / Bo | Comments on Russell City Energy Center Project's Staff Assessment | 8 |
| 23400 | 12 / 3 / 01 | CEC / Lewis / Dockets | City of Hayward / Armas | General Plan recognizes that the entrance into Hayward via the Hayward-San Mateo Bridge | 2 |
| 23301 | 11 / 26 / 01 | CEC / Lewis / Dockets | US Dept of Interior Fish and Wildlife Service / Knig | endangered Species Issues Related to the Russell City Energy Center | 2 |
| 23096 | 11 / 16 / 01 | CEC / Dockets | CEC / Keese | Staff Assessment Workshop POS | 7 |
| 23241 | 11 / 14 / 01 | CEC / Lewis / Dockets | BAAQMD / Garvey | Preliminary Determination of Compliance - Notice Inviting Written Comments | 78 |
| 23027 | 11 / 9 / 01 | Dockets | CEC / Keese, Pernell | Hearing Notice and Committee Revised Scheduling Order POS | 7 |
| 23028 | 11 / 7 / 01 | CEC / Dockets | CAL ISO / Hunt | Transmission System Reliability Testimony POS | 22 |
| 22993 | 11 / 6 / 01 | Agency Distribution List / Dockets | CEC / Richins | Request for Agency Comments on the Staff Assessment for the Russell City Energy Project | 1 |
| 22952 | 11 / | Dockets | CEC / PAO | Sign-In Sheet | 1 |

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| | 5 / 01 | | | 11 / 5 / 01 Committee Scheduling Conference | |
| 22915 | 11 / 1 / 01 | CEC / Lewis / Dockets | Russell City Energy Center / Leahy | Proposed Dates for Workshops on the Staff Assessment POS | 3 |
| 22916 | 10 / 31 / 01 | Dockets | CEC / Richins | Notice of Availability Staff Assessment | 3 |
| 22914 | 10 / 31 / 01 | Librarian | CEC / Richins | Document Handling | 1 |
| 22917 | 10 / 30 / 01 | CEC / Dockets | Roger Beers / Boney | Comments on East Bay Regional Park District on Staff's Petition to Convert Proceeding POS | 7 |
| 23280 | 10 / 30 / 01 | CEC / Dockets | CEC | Staff Assessment | 513 |
| 22870 | 10 / 29 / 01 | CEC / Dockets | Ellison, Schneider and Harris / Wheatland | Motion to Extend the Schedule Under the Provisions of Article 7 and Opposition to the Petition to Convert Proceeding POS | 8 |
| 22798 | 10 / 25 / 01 | Dockets | CEC / Keese, Pernell | Notice of Committee Scheduling Conference POS | 5 |
| 22720 | 10 / 18 / 01 | Dockets | CEC / Ratliff | Petition to Convert Proceeding POS | 5 |
| 22721 | 10 / | CEC / Lewis / | Russell Energyb | Response to City | 13 |

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| | 16 / 01 | Dockets | Center / Davy | of Hayward Data Request 13 POS | |
| 22760 | 10 / 15 / 01 | CEC / Lewis / Dockets | Russell City Energy Center / Grenier | System Impact Study - POS | 66 |
| 22694 | 10 / 11 / 01 | CEC / Lewis / Dockets | Alex@ci.hayward | RCEC and Mt. Diablo News | 3 |
| 22758 | 10 / 10 / 01 | Dockets | Russell City Energy Center | System Impact Study - Generation Interconnection | 1500 |
| 22646 | 10 / 9 / 01 | CEC / Dockets | Bechtel Enterprises Holdings, Inc. / Wheatland | Russell City Energy Center Status Report # 2 - POS | 5 |
| 22579 | 10 / 3 / 01 | CEC / Lewis / Dockets | Foster Wheeler Environmental Corporation / Davy | Appendix 10G Geologic and Foundation Design Criteria and a Seismic Hazards Study | 125 |
| 22532 | 9 / 27 / 01 | CEC / Dockets | PAR Environmental Services Inc | Historical Evaluation of the Eastshore-Grant Transmission Line, Hayward, Alameda County, CA | 25 |
| 22462 | 9 / 26 / 01 | CEC / Keese, Pernell / Dockets | CEC / Lewis | Request for Schedule Change | 5 |
| 22437 | 9 / 25 / 01 | Dockets | CEC / Keese, Pernell | Order Granting Petition to Intervene-Ted Radosevich POS | 4 |
| 22405 | 9 / 21 / 01 | CEC / Lewis / Dockets | Russell City Energy Center / Davy | Responses to City of Hayward Data Requests 25 and 53 POS | 29 |
| 22406 | 9 / | CEC / Lewis / | Russell City | Biological | 85 |

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| | 21 / 01 | Dockets | Energy Center / Davy | Assessment | |
| 22398 | 9 / 20 / 01 | CEC / Dockets | Law Office of Roger Beers / Boney | Petition to Intervene by East Bay Regional Park District | 8 |
| 22419 | 9 / 20 / 01 | CEC / Dockets | Beers | Petition to Intervene by East Bay Regional Park District POS | 7 |
| 22305 | 9 / 14 / 01 | CEC / Lewis / Dockets | Russell City Energy Center / Davy | Revised Responses to CEC Staff Data Request 98 and Additional Information Request Visual-2 POS | 8 |
| 22327 | 9 / 14 / 01 | CEC / Lewis / Dockets | City of Hayward / Ameri | RCEC Data Workshop Follow Up Items | 102 |
| 22303 | 9 / 13 / 01 | CEC / Keese, Pernell / Dockets | CEC / Lewis | Status Report #1 | 4 |
| 22224 | 9 / 12 / 01 | CEC / Dockets | CAPE / CEC / Lewis | Duct Firing at Power Plants in California | 21 |
| 22252 | 9 / 12 / 01 | CEC / Lewis / Dockets | Russell City Energy Center / Davy | Response to Additional CEC Staff Data Requests and Additional Information in Support of the AFC - POS | 89 |
| 22645 | 9 / 12 / 01 | Dockets | Russell City Energy Center Project | Cooling Tower and HRSG Exhaust Visible Plume Analysis Testimony of | 6 |

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| 22200 | 9 / 7 / 01 | CEC / Dockets | Bechtel Enterprises Holdings, Inc / Wheatland | Russell City Energy Center Status Report - POS | 6 |
| 22201 | 9 / 7 / 01 | CEC / Dockets | Ellison, Schneider & Harris, LLP / Wheatland | Applicant's Notice of Objection and Inability to Respond to Staff Additional Visual Requests 3, 4, 5 and 6 - POS | 7 |
| 22304 | 9 / 7 / 01 | CEC / Lewis / Dockets | East Bay Regional Park District / Tong | Clarification of written comments submitted by the East Bay Regional Park District at the August 20, 2001 issues workshop | 2 |
| 22165 | 9 / 5 / 01 | CEC / Dockets | CEC / Keese / Pernell | Order Granting Petition to Intervene - POS | 4 |
| 22130 | 8 / 29 / 01 | CEC / Knight / Dockets | East Bay Regional Park Dist. / Tong | Hayward Regional Shoreline / Calpine-Russell City Energy Center Visual Impact | 3 |
| 22067 | 8 / 28 / 01 | CEC / Lewis / Dockets | Russell City Energy Center / Davy | Additional Information in Support POS | 50 |
| 22023 | 8 / 27 / 01 | US Army Corps of Engineers / Fong / CEC / Dockets | United States Department of the Interior / Knight | Comments regarding the Russell City Energy Center POS | 5 |
| 22017 | 8 / 24 / | CEC / Dockets | Rehon and Roberts / Delany | Petition for Intervention by | 3 |

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| | 01 | | | Adjacent Landowner Parker Ventures LLC POS | |
| 21982 | 8 / 23 / 01 | CEC / Lewis / Dockets | Russell City Energy Center / Grenier | Data Requests - POS | 48 |
| 21974 | 8 / 21 / 01 | CEC / Dockets | Audrey LePell | Comments on the Hearing | 3 |
| 21999 | 8 / 20 / 01 | CEC / Dockets | Russell City | Data Response & Issue Workshop Project Mailing List | 7 |
| 21865 | 8 / 14 / 01 | CEC / Lewis / Dockets | Russell City Energy Center | Calpine / Bechtel Responses to Staff Data Requests | 352 |
| 21841 | 8 / 13 / 01 | CEC / Fay / Dockets | Russell City Energy Center / Grenier | Calpine / Bechtel Power Point Presentation at the August 7, 2001 Informational Hearing and Site Visit | 22 |
| 21953 | 8 / 13 / 01 | Calpine / Bechtel Joint Development / Leahy / CEC / Docket | California Regional Water Quality Control Board / Li | Response to information request from CEC | 3 |
| 22886 | 8 / 13 / 01 | Calpine / Bechtel Joint Delevopment / Leahy / CEC / Docket | California Regional Water Control Board / Lichten | CEC Information Requests, Russell City Energy Center | 3 |
| 21808 | 8 / 10 / 01 | Dockets | CEC / Keese, Pernell | Committee Scheduling Order POS | 6 |
| 21779 | 8 / 9 / 01 | Dockets | CEC / Keese | Data Response and Issue | 5 |

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| | | | | Workshop Notice for 8 / 20 / 01 POS | |
| 21812 | 8 / 9 / 01 | Dockets | CEC / Harris | An addition to the Russell City POS | 3 |
| 21781 | 8 / 8 / 01 | CEC / Keese / Dockets | East Bay Regional Park District / Tong | Hayward Regional Shoreline | 8 |
| 21785 | 8 / 7 / 01 | CEC / Keese, Pernell / Dockets | CEC / Mendonca | Status Report #1 | 1 |
| 21783 | 8 / 7 / 01 | Dockets | CEC / Mendonca | August 7, 2001 Informational Hearing and Site Visit | 11 |
| 21775 | 8 / 4 / 01 | CEC / Dockets | Connie Danielson | Letter of Support | 1 |
| 21738 | 8 / 3 / 01 | CEC / Dockets | Ellison, Schneider, Harris / Wheatland | Applicant's Proposed Schedule POS | 4 |
| 21737 | 8 / 3 / 01 | CEC / Dockets | Ellison, Schneider, Harris / Wheatland | Applicant's Notice of Objection and Inability to Respond to Certain CEC Staff Data Requests POS | 5 |
| 21780 | 8 / 3 / 01 | CEC / Lewis / Dockets | City of Hayward / Butler | Data Requests Related to Russell City Energy Center | 20 |
| 21697 | 7 / 31 / 01 | CEC / Keese, Pernell / Dockets | CEC / Lewis | Issue Identification Report POS | 10 |
| 21628 | 7 / 25 / 01 | Calpine / Bethel / Leahy / CEC / Dockets | CEC / Lewis | Staff Data Requests | 31 |
| 21566 | 7 / 19 / | Dockets | CEC / Keese, Pernell | Notice of Informational | 8 |

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| 21623 | 7 / 18 / 01 | Dockets | CEC / Keese, Pernell | Order Granting Petition to Intervene | 1 |
| 21492 | 7 / 16 / 01 | CEC / Dockets | Adams Broadwell Joseph & Cordozo / Joseph | Petition to Intervene by CURE - POS | 5 |
| 21358 | 7 / 9 / 01 | CEC Commissioner / Dockets | CEC / Larson | Revised Data Adequacy Recommendation | 45 |
| 21307 | 7 / 5 / 01 | CEC / Fromm / Docket | Foster Wheeler Environmental Corporation / Davy | Letter from Regional Water Quality Control Board | 4 |
| 21312 | 7 / 3 / 01 | Public Work Utilities City of Hayward / Ameri / CEC / Fr | California Regional Water Quality Control Board / Le | Faxed Copy from D. Davy-National Pollutant Discharge System Permitting Consideration Regarding Russell City Energy Center and Advanced Wa | 3 |
| 21511 | 7 / 2 / 01 | CEC / Commissioners / Docket | CEC / Pernell | Hearing Office Assignment | 1 |
| 21110 | 6 / 26 / 01 | Dockets | Russell City Energy Center | CD's - Cumulative Impacts Met Data | 4 |
| 21232 | 6 / 21 / 01 | CEC / Keese / Docket | Calpine Corporation / Leahy | Request that the Commission continue Items 2 and 3 from the June 27th, 2001 Business Meeting | 1 |

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| 21104 | 6 / 20 / 01 | Agency Distribution List / Dockets | CEC / Richins | Request for Agency Participation in the Review of the Russell City Energy Center AFC Supplemental Information | 1 |
| 21187 | 6 / 20 / 01 | Docket | CEC / Richins | Notice of Receipt Supplemental Information | 1 |
| 21103 | 6 / 20 / 01 | Librarian / Dockets | CEC / Richins | Document Handling for Russell City Energy Center Project Supplemental | 1 |
| 20970 | 6 / 19 / 01 | CEC / Larson / Dockets | Calpine Corp / Leahy | Russell City Energy Center Supplement Information | 160 |
| 21281 | 6 / 15 / 01 | CEC Commissioners / Dockets | Silicon Valley Manufacturing Group / Guardino | Letter supporting the project | 1 |
| 20811 | 6 / 12 / 01 | CEC Commissioners / Dockets | CEC / Larson | Data Adequacy Recommendation | 94 |
| 20877 | 6 / 11 / 01 | CEC / Larson / Docket | Bay Area Air Quality / Lee | Fax-Completion of initial review of the Application for Certification | 1 |
| 20907 | 6 / 11 / 01 | RTP Environmental Associates / Davin / Docket | Bay Area Air Quality Management District / Wocasek | Fax-Incomplete application | 4 |
| 20906 | 6 / | Bay Area Quality | RTP | Fax- | 3 |

| | | | | | |
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| | 11 / 01 | Management District / Wocasek / Docke | Environmental Associates Inc. / Darvin | Incompleteness Letter for the Calpine Corporation Russell City Energy Center Application 2896, Plant 13161 | |
| 20855 | 6 / 11 / 01 | BAAQMD / Wocaske / Dockets | RTP Environmental Assoc / Darvin | Incompleteness Letter | 3 |
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| 20840 | 6 / 11 / 01 | CEC / Lewis / Dockets | SF Bay Regional Water Quality Control Board / Lichte | Projects wetlands and storm water issues | 7 |
| 20710 | 6 / 5 / 01 | Ellison, Schneider & Harris / Wheatland / Docket | CEC / Larson | Paleontological Resources Locations, Application for Confidentiality | 2 |
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| 20719 | 5 / 31 / 01 | Librarian | CEC / Richins | Document Handling | 1 |
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| | | To | From | Subject | |

To: The Bay Area Air Quality Management District Board of Directors.

I would like to demonstrate a major opportunity to preserve the bay area air quality and reduce global warming and protect the renewable energy industry.

Recently the air district approved 2 fossil fuel fired power plants in the city of Hayward. They are sandwiched between the shoreline federally protected Endangered species and habitats and a 69% minority and low income community.

PGEs next round of confidential purchase agreements is coming up. Additional Bay Area thermal power plants are eminent. The Bay Area is one of the cheapest, easiest places to pollute in the state. Carbon monoxide credits sold for an average of \$377 per ton in the bay area in 2006. The statewide average was 53 times higher at \$14,835 with a high of \$41,096. NO2 credits sold in the Bay area for an average of \$12,470. The Statewide average was \$81,650 per ton with a high of \$410,959 per ton. This would make the NO2 ERCs for a 600MW facility like Calpine has planned for Hayward \$10,653,720 cheaper than the state average and \$61,287,686 cheaper than the statewide high just by placing it in the bay area.

BAAQMD staff licensed obsolete technology for the Calpine facility despite the California Energy Commission recommending 2 options for modern technology that would reduce the NO2 emissions from 2213 pounds per day to 950 or 640 lbs per day. We are poised to become the emissions dump of the state.

Since the equipment approved is no longer manufactured (staff confirmed) that Calpine may install used equipment from another

district potentially generating ERCs in that district for installing new equipment there. If they brought it from Southern California Where the NO2 ERCs cost \$410,959 per ton they could generate \$45,567,000 worth of NO2 credits alone at 2006 prices, by installing modern equipment in Southern California and installing the old equipment here. Remember Calpine is the company that was fined \$6,000,000 by the Attorney Generals office for manipulating the energy market

Despite the opportunity to do so BAAQMD staff did not even measure the CO2 emissions from the 2 plants. If the Calpine facility conforms with SB 1368 it may emit 2,760,120 tons of CO2 per year. There is no evidence leading us to believe that it does conform. Compare that to the goals stated in the \$3,000,000 climate protection grant program of 350,000 Tons of greenhouse gas reductions over 5 years Calpine will emit that in about 8 days.

The second facility is a 115MW plant consisting of 14 locomotive sized reciprocating engines. It will emit 64.39 tons of particulate matter and 76.11 tons of POCs compared to Los Esteros 320 MW plant that proposed only 53.3 tons of PM and 28.3 tons of POCs per year

BAAQMD staff did not make findings of public benefit. They did not properly notify the public, the County, The City, BCDC, USFWS or others of their process. They did not have public hearings. They allowed the even cheaper POC credits to be substituted for NO2 credits.

Politicians, public health Officials environmental groups and the public lined up in resistance to the polluters believing that BAAQMD heard their concerns through mutual participation in the CEC Hearings. BAAQMD staff did not consider these comments or the public hearings in their approval of the plants.

The CEC did not determine that there was a need for the additional capacity in the bay area but the demand is increasing in the Sacramento area. The obligations of this much additional capacity will undermine renewable energy efforts throughout the region. When Communities choose Community Choice Aggregation and other renewable options the rejecting this type of power PGE will still receive a surcharge for the capacity investment.

This same thing can happen again in any Bay Area City if the board does not act.

Please issue a moratorium on ERC banking until better policies can be adopted. The credits were not contemporaneous some of them were from 1984. Encourage staff to follow existing rules and promote participation. Support my appeal docket No.3546 at least monitor the hearings and intervene from your respective positions throughout the Bay Area.

Rob Simpson 510-909-1800

| Table 3.1-6 Maximum Annual Gas Turbine Emissions (combined emission both gas turbines) | | | |
|---|---|-------------------------|-------------------|
| | Previously Permitted Project^a | Proposed Project | Net Change |
| Pollutant | Tons/year | Tons/year | Tons/year |
| Normal Operation | | | |
| NOx | 123.8 | 72.7 | -51.1 |
| CO | 75.4 | 66.4 | -9.0 |
| VOC | 30.7 | 25.3 | -5.4 |
| SOx | 11.9 | 6.9 | -5.0 |
| PM ₁₀ | 100.7 | 48.0 | -52.7 |
| Startups/Shutdowns | | | |
| NOx | 29.2 | 18.3 | -10.9 |
| CO | 18.3 | 127.7 | 109.4 |
| VOC | 0.9 | 5.4 | 4.5 |
| SOx | 0.4 | 0.6 | 0.2 |
| PM ₁₀ | 4.0 | 3.8 | -0.2 |
| Total Emissions | | | |
| NOx | 153.0 | 91.0 | -62.0 |
| CO | 93.6 | 194.1 | 100.5 |
| VOC | 31.6 | 30.7 | -0.9 |
| SOx | 12.4 | 7.4 | -5.0 |
| PM ₁₀ | 104.8 | 51.8 | -53.0 |

^aFrom September 2002 Final Staff Report for the El Segundo Power Redevelopment Project (00-AFC-14), Air Quality Table 12.

| Table 3.1-7 Comparison of Hourly CO Gas Turbine Emissions – Startups/Shutdowns (per gas turbine) | | |
|---|--------------------|---|
| Project | Gas Turbine | Startup/Shutdown CO Emissions (Lbs/hr) |
| Proposed ESPR Project | Siemens SGT6-5000F | 823 |
| East Altamont Energy Center | GE 7FA | 930 ^a |
| Metcalf Energy Center Project | Siemens 501F | 2,500 ^b |

^aFrom Commission Decision for the East Altamont Energy Center (01-AFC-04), August 2003, COC AQ-14.

^bFrom Commission Decision for the Metcalf Energy Center Amendment (99-AFC-3C), March 2005, COC AQ-11.



Commission
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To be announced

Amendment Proceeding

Notices &
Announcements
(Updated: 7/5/07)

- **6/19/2007 - Amendment petition filed with Energy Commission.**

**Also see our
Energy
Calendar**

Documents and
Reports
(Updated: 10/19/07)

Docket Log
00-AFC-14C

Notices and
Documents Since
Compliance But
Not Related to
This Amendment
Proceeding

Original Proceeding

Docket# 00-AFC-
14

Participation

Public Adviser's
Office

Guide to Public

On June 19, 2007, El Segundo Power II, LLC (El Segundo) filed a petition with the California Energy Commission requesting to amend the Energy Commission Decision to eliminate the use of ocean water as the cooling water source for the El Segundo Power Redevelopment Project (ESPR). The petition proposes a new rapid response combined cycle (R2C2) design that will allow the project to operate without once-through cooling, along with changes to the previously approved laydown/staging areas and access routes. The 630 MW ESPR was originally certified by the Energy Commission at a special Business Meeting on December 23, 2004, but a second Business Meeting to consider errata was held on February 2, 2005. The decision, with errata, was certified on February 2, 2005. A petition challenging the certification was filed with the California Supreme Court shortly thereafter, thus delaying the effective date of the decision. With the Court's denial of the petition on August 31, 2005, the decision

Participation In
Siting Cases

Commission
Siting Division

Overview of
Siting Process

Title 20 Calif.
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Regulations

Acronyms Used in
Siting Cases

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became final. The facility is located in the City of El Segundo in Los Angeles County.

El Segundo has proposed eliminating the use of ocean water as the cooling water source for the project by redesigning the facility to use fast-start turbines and dry-cooling. Additional changes have been proposed to the project, to support this change in design and to address a new laydown area and new equipment delivery options. The following is a list of the proposed changes to the project:

- Redesign the facility to replace the approved turbines and once-through cooling system with a R2C2 design and dry-cooling, changing the nominal plant capacity from 630 MW to 560 MW;
- Change the delivery method of oversize equipment to include ocean delivery over the beach and a new land route;
- Replace the previously approved Fed Ex laydown area (now developed) with a new laydown area at 777 W. 190th Street; and Modify the plant entrance road and gate area to allow the delivery of oversized equipment.

The Energy Commission is the lead agency under the California Environmental Quality Act (CEQA) and has a certified regulatory program under CEQA. Under its certified program, the Energy Commission is exempt from having to prepare an environmental impact report. Its certified program, however, does require environmental analysis of the project, including an analysis of alternatives and mitigation measures to minimize any significant adverse effect the project may have on the environment.



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E-mail: mediaoffice@energy.state.ca.us

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Page Updated: 12/28/2007



2.0 Proposed Amendment to the Project Description

ESPR was certified by the CEC on February 2, 2005. ESPR was permitted as a nominally rated 630-megawatt (MW) combined-cycle facility located at the existing El Segundo Generating Station in El Segundo, California (Figure 2.0-1). ESP II is proposing several modifications to the previously permitted project, which requires an amendment to the permitted project design and related Conditions of Certification. The modifications are limited in scope and center around the following proposed changes:

1. Specification of different equipment and design to take advantage of state-of-the-art technology not available during siting of the previously permitted project (i.e., rapid response with combined cycle). The new R2C2 design will consist of two gas turbine generators (GTG), heat recovery steam generator (HRSG), and one steam turbine generator (STG) utilizing air cooled heat exchangers for cycle heat rejection. The R2C2 air cooled design will enable water/steam cycle wastewaters to be recycled back to the single-pressure RO water storage tank where they will be diluted for reuse as evaporative cooler makeup or reprocessed by mobile demineralizers. With the zero liquid discharge system, water/steam cycle wastewaters will be recycled and reused to the extent practicable eliminating once-through cooling at the site and eliminating discharge of water/steam cycle wastewaters. In addition, the modification of power delivery equipment will change the nominal plant capacity from 630 MW to 560 MW.
2. Different method of delivery of the oversize equipment to the plant including ocean delivery by barge over the beach using proven state-of-the-art technology and a new land route.
3. Addition of one new offsite laydown area and removal of a previously considered laydown area. The new offsite laydown area (referred to as "777 W. 190th Street") has ample space for component and equipment staging and parking for ESPR. One laydown area (Fed Ex) will be removed, because it is no longer available for staging or parking (i.e., the property has been redeveloped into a multi-level commercial building).
4. Modifications of the plant entrance road and gate area to enable delivery of oversize equipment to the plant during the construction phase of ESPR and to improve future equipment deliveries into the plant.

The benefits of these proposed modifications to ESPR are significant and include the following:

1. The use of the R2C2 technology eliminates the need for once-through cooling and the associated impingement and entrainment effects on marine resources.
2. Unprecedented rapid response design that provides comparable start-up rates to simple cycle units with the efficiency of a combined cycle power plant; specifically, each unit can deliver 150 MWs of capacity within 10 minutes of startup;

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CALIFORNIA ENERGY COMMISSION
1515 MINT STREET
SACRAMENTO, CA 95832-0151



May 29, 2007

Mr. Jack P. Broadbent
Executive Officer/Air Pollution Control Officer
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Dear Mr. Broadbent,

**AMENDED PRELIMINARY DETERMINATION OF COMPLIANCE FOR THE
RUSSELL CITY ENERGY CENTER, APPLICATION 15487**

Thank you for the opportunity to comment on the Amended Preliminary Determination of Compliance (PDOC) for the proposed Russell City Energy Center (RCEC), a 600 MW combined cycle project located in the city of Hayward. In the Amended PDOC the District finds that, subject to specified permit conditions, the proposed project will comply with all applicable federal, state and Bay Area Air Quality Management District (District) rules and regulations.

In considering this project, we believe there may be better and more direct ways to reduce or avoid the cumulative impacts from ozone precursor emissions than those proposed by the project owner. We believe that there is current technology that the District should consider requiring as Best Available Control Technology (BACT) that will significantly limit the ozone precursor emissions that result from start-up and load following transitions. We believe that impact avoidance (i.e., preventing emissions) is generally a better approach than impact mitigation of air emissions through the provision of offsets when complying with the requirements of the California Environmental Quality Act.

OFFSETS

The planned operating profile of the project, frequent start-up and shutdown cycles, is creating a significant disparity between the daily emissions and the average daily offsets. The project owner is requesting that no District or Energy Commission conditions be attached to the project that would restrict the number of start-up and shutdown cycles or the annual hours of operation. They would, instead, accept a condition that would limit the facility's annual emissions to 134 tons per year (TPY) of oxides of nitrogen (NOx) and 28.5 TPY of precursor organic compounds (POC).

The Amended PDOC, per the District New Source Review (NSR) regulations, identified that RCEC will surrender emission reduction credits (ERC) in the amounts of 103 TPY of NOx and 80 TPY of POC to offset new emissions of 134 TPY of NOx and 28.5 TPY of POC. On a daily basis, including days that experience ozone violations, staff estimates that the project could emit up to 2,213 lbs of NOx, while the proposed

emission reduction credits provided would amount to only 844 lbs per day. This offset amount mitigates approximately 38 percent (844 lbs/2,213 lbs) of the project's potential emissions for NOx on any given day. Thus on those days when violations of the ozone air quality standards occur, the project's emissions would contribute to violations of the standard.

BACT

According to the Amended PDOC, each unit of the RCEC must be equipped with BACT for NOx, carbon monoxide (CO), POC, particulate matter less than 10 microns (PM10), and oxides of sulfur (SOx). The Amended PDOC states that BACT for each unit is the use of selective catalytic reduction (SCR) and CO oxidation catalyst systems to control NOx, POC and CO emissions, and the use of natural gas as BACT for PM10 and SOx.

The SCR system will maintain a normal operation NOx emissions limit of 2.0 parts per million (ppm) averaged over a one-hour period. The District determined that this meets District guidelines for BACT. Missing from this determination is consideration of the facility's potential high daily NOx emissions from multiple start-up and shutdown cycles. Energy Commission staff estimates that the facility can potentially emit 2,213 pounds per day of NOx. The hourly emissions during start-up and shutdown events are much greater than during normal operation since the SCR and ammonia injection system are not at optimal conditions. The resulting daily emissions could have a significant effect on ozone and air quality in the Bay Area air basin because the proposed NOx emission reduction credits are approximately equivalent to 844 pounds per day, well below the potential emissions of 2,213 pounds per day of NOx.

Energy Commission staff recommends that the district consider requiring, as part of their BACT analysis, hardware and software modifications to the project that can shorten start-up and shutdown events and optimize emission control systems. There is evidence that start-up and shutdown emissions from the facility can be reduced significantly with design changes to the heat recovery steam generator (HRSG) units that can include the use of the once-through HRSG (Benson Boiler). The start-up time for each turbine/HRSG unit could be reduced from the proposed 6 hours to approximately one hour, resulting in a significant reduction in start-up emissions. If the project is built with the aforementioned Fast-Start technology, the project start-up NOx emissions are expected to be reduced from the proposed 480 lbs to 22 lbs for each cold start-up event, and from 240 lbs to 28 lbs for hot or warm start-up events. This represents 95 and 88 percent reductions in NOx emissions per cold and hot or warm start-up events, respectively. In addition to reducing the facility's NOx emission liabilities, the use of Fast-Start technology at the RCEC project would result in cost savings from less fossil fuel use to create steam that is vented during start-ups. Staff has not estimated the actual fuel saving because this cost will tie directly to how many start-up and shutdown cycles the facility has during a year. According to one manufacturer (Siemens), the cost for the design changes is not significantly higher than the cost of the standard, off the shelf, HRSG.

Mr. Jack P. Broadbent
May 29, 2007
Page 3

Alternatively, the 600 MW combined cycle Palomar Project in Escondido has installed a proprietary control system, OpFlex from General Electric, and injects ammonia earlier to shorten start-up times and reduce start-up emissions at the facility. Preliminary, non-optimized results from their March 7, 2007, Petition for Variance 4703 Extension indicated that they have reduced NOx emissions from 120 lbs to 28 lbs for hot or warm start-up events.

If design or process control changes to reduce the facility's start-up and shutdown emissions are implemented, the RCEC daily emissions can be reduced. These design changes could be found to be cost-effective and included as BACT for the proposed facility.

GENERAL COMMENTS

- Page 2 and page 36 of the Amended PDOC identifies the source S-5, the cooling tower, "with efficiency drift eliminators make and model to be determined" while on page 14 the drift is specified as 0.0005%.
- Page 4, Item 3.c. identifies the POC limit of 1 ppmvd @15% O₂. However, Table 1 on the same page identifies POC limit of 2 ppmv.
- Page 5, Table 2 identifies PM10 emissions from the cooling tower, although drift elimination efficiency was not specified on page 2 and the TDS limits are not provided.
- Page 13 and Condition 20(g) specifies that the project will burn natural gas in the turbine and heat recovery steam generator with an annual average of 0.25 grains sulfur per 100 standard cubic feet. What is the basis for this value and how will it be enforced?

Thank you for the opportunity to provide comments on the District Amended PDOC for the Russell City Energy Center. We believe that design changes to the project could significantly reduce the facility's daily potential to emit, and at the same time address the effectiveness of the applicant's proposed offset mitigation. If you have any questions regarding our comments, please contact Matt Layton at (916) 654-3868.

Sincerely,



PAUL C. RICHINS, JR
Environmental Protection Office Manager

cc: Docket (01-AFC-7)
Proof of Service List
Agency List

the emissions reduction credits provided would only equal 848 lbs per day on an equivalent basis, which is approximately 38 percent (848 lbs/2,213 lbs) of the project's potential emissions for NOx. It should be noted that the project owner has stated the staff estimated facility's daily NOx potential emissions (**AIR QUALITY Table 2**) are based on a rare event, which could only happen a few times in a year.

Do the proposed ERCs adequately mitigate the project's expected daily emissions?

The project owner has asserted that the more typical, normal operating day of the facility could include a hot start-up, about 16 hours of normal operation followed by a shutdown. Staff believes that this pattern is consistent with operations data from other combined cycle facilities in the state. Therefore, staff attempted to estimate a reasonably expected operating profile for the facility and the associated emissions, and verify whether the proposed ERCs could adequately mitigate the facility emissions.

Staff estimated probable daily facility NOx emissions to be approximately 1,093 lbs per day (see **AIR QUALITY Appendix 1**) from one hot start-up followed by 14 hours of normal operation and one shutdown each day for each gas turbine/HRSG power unit. Even at this level, the proposed ERCs of 848 lbs of NOx a day would mitigate only 78 percent³ of the facility emission impacts on any given day.

The District's PDOC contains a facility NOx emissions limit of 1,553 pounds per day (BAAQMD - 2007), which is also twice the amount of ERCs proposed. Thus, regardless of whether the facility operated in maximum worst-case or reasonably expected case, the provided ERCs would not adequately mitigate the project's daily NOx emission impacts.

Is there alternative technology that can reduce the project's emission liability?

The project, as proposed, is designed to operate most efficiently in base load mode. The project owner is interested in operating the facility as a load-following facility, i.e., frequent, or daily start-ups and shutdowns. The majority of the facility daily NOx emissions are caused by start-up and shutdown events, as shown in **AIR QUALITY Table 2**, where hourly start-up emissions rates are six, seven and 68 times higher than normal operation for NOx, POC and CO, respectively. Because of this, staff investigated if design changes to the project could shorten start-up durations and reduce start-up emissions. Staff found that if the project used the Siemens-Westinghouse Benson Once-Through boiler technology, start-up and shutdown emissions would be significantly reduced such that the proposed offsets would be adequate to mitigate the project's daily NOx emissions. Alternatively, some projects have incorporated an auxiliary boiler or solar array to provide steam that can shorten start-up times.

According to a vendor of this technology, the Siemens-Westinghouse, Benson Once-Through or Fast-Start technology can be designed to fit the proposed 501 FD combustion turbines without additional capital costs above that of the standard, off-the-

³ 848 lbs/day divided by 1093 lbs/day = 0.78 or 78 percent

shelf, HRSG that the project owner has proposed⁴. If the project is built with the aforementioned Fast-Start technology, the project start-up NOx emissions are expected to be reduced from the proposed 480 lbs to 22 lbs for each cold start-up event, and from 240 lbs to 28 lbs for hot or warm start-up events. This represents a 95 percent and 88 percent emission reduction of NOx for cold, and hot or warm start-up events, respectively. In addition to reducing the facility's NOx and POC emissions, the use of Fast-Start technology at the RCEC would result in cost saving from less fossil fuel used to create steam that is vented during start-ups. Staff has not estimated the actual fuel savings because this cost will tie directly to how many start-up and shutdown cycles the facility has during a year.

Staff believes that the Siemens-Westinghouse Fast-Start technology is an alternative technology that would mitigate the project impacts to the environment; Staff therefore recommends that, unless the project owner accepts conditions that restrict the start-up duration and emissions, the RCEC should be built employing the Fast-Start technology or its equivalent to reduce the start-up and shutdown event emissions. Staff's recommendation is incorporated into Condition of Certification **AQ-SC7** through **-SC10**.

Alternatively, the 600 MW combined cycle Palomar Project in Escondido has installed a proprietary control system, OpFlex from General Electric, which allows ammonia to be injected at the earliest time to shorten start-up times and reduce start-up emissions at the facility. Preliminary, non-optimized results from their March 7, 2007, Petition for Variance 4703 Extension indicated that they have reduced NOx emissions from 120 lbs to 28 lbs for hot or warm start-up events.

Staff provided a comment on May 29, 2007, to the District on the PDOC for RCEC that the District consider hardware and software modifications to the project to shorten start-up times and significantly reduce start-up emission as BACT.

Is there alternative operational change that can reduce the facility emission liability?

The project owner claims that redesign of the project with Fast-Start technology would involve significant costs as they have purchased some equipment and designed the project and systems. These cost increases and redesign may require extensive renegotiations with their financing entities. However, Staff notes that the El Segundo Power Redevelopment Project (00-AFC-14), in order to meet changing electricity market demands, just filed a major amendment (June 15, 2007) redesigning their project from a "traditional" combined cycle to a Rapid Response Combined Cycle that will use Siemens combustion turbines (replacing the previously approved GE CTGs) and Benson once-through boilers.

Staff has asked for and the project owner has provided an expected operational scenario for the facility. The owner states that most likely, each turbine would undergo a cold start-up and combustor tuning about once a year. This is the activity that causes the highest start-up emissions of 480 lbs of NOx per start; most other non-cold start-ups would be in the range of 30 to 40 lbs of NOx per event and there are some rare events

⁴ May 2, 2007, telephone conversation with Thomas Karastamatis - Siemens Power System Sales

when the start-up emissions would exceed the 40 lbs of NOx per start⁵. Thus for most of the year the project would be either in a hot start-up event, normal operation with the SCR fully operational, shutdown event or not operating. The ERCs provide 424 lbs of NOx per day per turbine (848 lbs/day divided by two turbines). On a daily basis with about 16 hours of normal operation, the project NOx daily emissions would be 259 lbs per turbine, which leaves about 165 lbs of NOx for start-up and shutdown event emissions⁶. Thus for most days of the year, assuming typical shutdown emissions of 40 lbs of NOx per event, the remaining 125 lbs of NOx per day can be dedicated to one hot start-up event. During these days, the project owner proposed ERCs would adequately mitigate the project's probable NOx emission liability. To ensure proper mitigation during other periods, the project owner agreed to conditions that restricted the facility maximum daily emissions to 1,225 lbs per day during the ozone season (between June 1 and September 30), and will put aside additional ERCs to mitigate any NOx emissions in excess of 848 lbs/day if that happened. Thus on any one day, the project emissions would be fully mitigated with ERCs.

To facilitate the project owner concerns about the cost of redesigning the project, staff has developed and recommends the adoption of Conditions of Certification **AQ-SC7** and **AQ-SC8** to address the project emissions and its mitigation.

Condition of Certification **AQ-SC7** would place a facility maximum NOx emission limit of 1,225 lbs/day during the June 1 through September 30 time period, and that any NOx emissions greater than 848 lbs/ day shall be mitigated with ERCs.

Condition of Certification **AQ-SC8** places a NOx emission limit of 125 lbs for each hot/warm start-up event per combustion turbine and 40 lbs for each shutdown event per combustion turbine.

Ozone Precursors: POC

Similar to the project NOx emissions, the project POC emissions also correlate strongly with the start-up and shutdown events. Staff estimated that the project potential POC emissions would be 42.5 tons per year (see **AIR QUALITY Table 2**), for which the project owner proposed to mitigate with 28.5 tons of ERCs (CH2MHILL 2007a). On a daily basis, the project potential POC emissions can be as high as 431 lbs (worst case), while the reasonable maximum daily⁷ POC emissions are approximately 207 lbs/day (see **AIR QUALITY Appendix 1**). The proposed POC ERCs, on an average daily basis, would be equivalent to 157 lbs⁸, thus the proposed ERCs are not enough to adequately mitigate the project's potential POC contribution to atmospheric ozone.

Similar to NOx emissions, the Fast-Start technology would be expected to reduce the combustion turbine start-up POC emissions from 96 lbs to 21 lbs per cold start-up event, and from 48 lbs to 32 lbs for a hot or warm start-up event. Staff estimated that

⁵ June 1, 2007, telephone conversation with Barbara McBride - Calpine

⁶ 424 lbs/day ERC - 259 lbs/day (normal operation emissions) = 165 lbs/day for start up and shut down emissions.

⁷ Based on one hot start-up, 14 hours of normal operation and one shutdown for each combustion turbine/HRSG unit.

⁸ (28.7 tons per year x 2000 lbs/ton) / 365 days/year = 157 lbs/day

with the Fast-Start technology, the project's POC emissions would be 223 lbs/day for the maximum (worst case) potential and approximately 163 lbs/day for the most probable (reasonable) case. The provided POC ERCs could be adequate to mitigate the project's POC contribution to the atmospheric ozone.

Alternatively, staff believes that restricting the period of cold start-up, combustor tuning activities similar to the aforementioned NOx emissions would also reduce the facility POC emission liability to the point that the project owner's provided ERCs would adequately mitigate both the POC and NOx emissions from the project. Staff recommends the adoption of Conditions of Certification **AQ-SC7** to **AQ-SC9**.

Ozone Precursors: Simultaneous Start of Both Turbines

The project owner requested the deletion of existing Condition of Certification **AQ-22** in the Decision to enable them to simultaneously start both combustion turbine/HRSG units. The project owner believes that because the submitted air dispersion modeling shows that the NOx emissions from simultaneous start-up of both combustion turbine/HRSG units would not cause a violation of the ambient air quality standard for NO₂, such start-up scenarios should be allowed (CH2MHILL 2007a).

Even though the modeling shows that the NO₂ standard is not violated during the simultaneous start-up of both combustion turbine/HRSG units, the project owner has not provided evidence or modeling that shows that putting such a large quantity of NOx and POC emissions from a start-up (960 lbs of NOx and 192 lbs of POC for simultaneous cold start-up of both combustion turbines) would not adversely affect the 1-hour and 8-hour ozone air quality standards, which are violated on a regular basis. Again, if the facility is intended to operate as a load-following facility, then using combustion turbines with the Fast-Start technology can significantly reduce emissions.⁹ In short, staff cannot recommend the deletion of simultaneous start of both turbines without the facility using Fast-Start technology or its equivalent to reduce start-up times and emissions. This requirement is incorporated into Conditions of Certification **AQ-SC9** and **AQ-SC10**.

SOx

The project owner will provide 12.2 tons of SOx ERCs from banking certificate number 989 for emission reductions from the Potrero facility in San Francisco to mitigate the project's SOx emissions. Staff has shown the amount in **AIR QUALITY Table 4** and incorporated the amount of SOx ERCs to mitigate the project's SOx emission impacts into Condition of Certification **AQ-SC11**.

PM10/PM2.5

The project owner stated that because the project is not required by the District to provide ERCs to mitigate its PM10 emissions, they do not have to mitigate the annual emissions liability. They proposed to mitigate the project's PM10 emissions during the times of the year when the area experiences violation of the PM10 standards, which is during the fall and winter times, or about half a year. According to this logic, the project

⁹ This would facilitate staff's recommendation that the facility should be designed and built with the Siemens-Westinghouse Fast-Start technology (mentioned above) to minimize unnecessary emissions to the atmosphere.

Staff Estimates

1. Facility's operational profile

According to the project owner, each turbine can go through one cold, one hot, two shut down events, and the rest are normal operation. Thus for every 24 hour period, each turbine can experience 9 hours of start up (6 hours for cold and 3 hours for hot) and 1 hour of shut down (0.5 hour each). The normal hours of operation would be 14 hours.

On the annual basis, each turbine can go through 52 cold, 260 hot start-ups and 312 shutdown. Thus each year, the start up and shut down hours for each turbine are:

$$= 52(6\text{hr}) + 260(3\text{hr}) + 312(0.5\text{hr}) = 1,248 \text{ hours}$$

This leaves approximate 7,116 hours [(8,364 hours - 1,248 hours)] of normal steady state operation.

2. Facility's potential emissions

On a daily basis

$$\text{NOx} = 2 \text{ turbines } [1 \text{ cold}(480) + 1 \text{ hot}(240) + 2 \text{ SD}(80) + 14 \text{ hr}(16.17)] \\ = 2,213 \text{ lbs/day}$$

$$\text{VOC} = 2 [1(96) + 1(48) + 2(16) + 14(2.82)] = 431 \text{ lbs/day}$$

$$\text{CO} = 2 [1(5,028) + 1(2,514) + 2(902) + 14(19.69)] = 19,603 \text{ lbs/day}$$

$$\text{PM}_{10} = 24\text{hrs}[2(9 \text{ lbs/hr}) + 2.83^{\text{a}} \text{ lbs/hr}] = 500 \text{ lbs/day}$$

$$\text{SOx} = 24\text{hrs}[(4.38\text{E}6 \text{ scf } (1\text{gr}^{\text{b}}/100\text{scf})/7000\text{gr/lbs}) (64/32)] = 300 \text{ lbs/day}$$

Notes:

- Cooling tower PM₁₀ emissions.
- Staff estimates the facility's potential daily SO_x emissions using the maximum 1 grain/100 scf sulfur content natural gas, and assumed full conversion of sulfur to sulfur dioxide.

On an annual basis

$$\text{NOx} = 2 \text{ turbines } [52\text{cold}(480) + 260\text{hot}(240) + 312\text{SD}(80) + 7116\text{hrs}(16.17)] \\ = 454,771 \text{ lbs/yr or } 227.4 \text{ TPY}$$

$$\text{VOC} = 2[52(96) + 260(48) + 312(16) + 7116(2.82)] = 85,062 \text{ lbs or } 42.5 \text{ TPY}$$

$$\text{CO} = 2[52(5,208) + 260(2,514) + 312(902) + 7116(19.69)] = 2,691,988 \text{ lbs} \\ \text{or } 1,346 \text{ TPY}$$

$$\text{PM}_{10}/\text{PM}_{2.5} = 8364\text{hrs}[2(9) + 2.83] = 174,222 \text{ lbs or } 87.1 \text{ TPY}$$

$$\text{SOx} = 8364\text{hrs}[4.38\text{E}6(0.25\text{gr}/100)/7000](64/32) = 26,167 \text{ lbs or } 13.08 \text{ TPY}$$

3. Facility probable maximum daily emissions

Staff believes that the facility's estimated potential emissions (see above) would rarely happen in practice. For both gas turbines to undergo a sequence of a cold start-up, a shutdown, a hot re-start, operate for a few hours, then shut down again would require the facility to have breakdown immediately after restarting from an extended outage for maintenance. Staff explored the most probable daily emissions of ozone precursor emissions at the facility.

According to data from the project owner and operational data collected from other facilities currently in operation, staff found the following scenario to be the most probable operational profile for the RCEC facility. The facility would have a hot start in the morning, operate normally for about 14 hours and then shut down overnight. If this is the case, the facility's ozone precursors emissions would be calculated as:

$$\begin{aligned} \text{NOx} &= 2 \text{ turbines [1 hot(240) + 1 SD(80) + 14 hr(16.17)]} \\ &= 1,093 \text{ lbs/day} \end{aligned}$$

$$\text{VOC} = 2 [1(48) + 1(16) + 14(2.82)] = 207 \text{ lbs/day}$$

4. What if the facility were built with GE Rapid Start process (see Victorville 2 Hybrid (07-AFC-1)?

The Victorville 2 Hybrid Power project is proposed to be built with GE turbines employing Rapid Start process. The start-up and shutdown NOx emissions guaranteed for the combustion turbines are 96 lbs per cold start-up, 40 lbs per hot start-up and 57 lbs per shutdown. Using these data, the RCEC worst case turbine/HRSG emissions would be:

$$\begin{aligned} \text{NOx} &= 2 \text{ turbines [1 cold(96) + 1 hot(40) + 2 SD(57) + 14 hr(16.17)]} \\ &= 950 \text{ lbs/day} \end{aligned}$$

5. What if the facility were built with Siemens-Westinghouse Benson Once Through Boiler (see City of Vernon (06-AFC-1)?

The City of Vernon Power project is proposed to be built with Siemens-Westinghouse 501FD turbines employing the Benson Once-through boiler. The start-up and shutdown emissions guarantee for the combustion turbines NOx emissions are 21.6 lbs per cold start-up, 28 lbs per hot start-up and 22 lbs per shutdown. Using these data, the RCEC worst case turbine/HRSG emissions would be:

$$\begin{aligned} \text{NOx} &= 2 \text{ turbines [1 cold(21.6) + 1 hot(28) + 2 SD(22) + 14 hr(16.17)]} \\ &= 640 \text{ lbs/day} \end{aligned}$$

$$\begin{aligned} \text{VOC} &= 2 \text{ turbines [1 cold(20.5) + 1 hot(32) + 2 SD(10) + 14 hr(2.82)]} \\ &= 223 \text{ lbs/day} \end{aligned}$$

Most probable case

$$\begin{aligned} \text{NOx} &= 2 \text{ turbines [1 hot(32) + 1 SD(10) + 14 hr(2.82)]} \\ &= 163 \text{ lbs/day} \end{aligned}$$

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Grandview Realty

From: James_Browning@fws.gov
Sent: Wednesday, November 07, 2007 9:56 AM
To: grandviewrealty@comcast.net
Subject: Fw: Russell City Energy Center (FWS File No. 1-1-07-I-1363)

----- Forwarded by James A Browning/SAC/R1/FWS/DOI on 11/07/2007 09:49 AM -----

James A Browning/SAC/R1/FWS/DOI

To rapicavoli.emmanuelle@epa.gov

cc Ryan Olah/SAC/R1/FWS/DOI@FWS

07/31/2007 08:39 AM

Subject Russell City Energy Center (FWS File No. 1-1-07-I-1363)

This is in response to your June 11, 2007, informal consultation letter requesting concurrence with your determination that the proposed construction of the Russell City Energy Center (proposed action) in Hayward, Alameda County, California, is not likely to adversely affect any federally listed species under the administration of the U.S. Fish and Wildlife Service. We received your letter and accompanying information on the proposed action on June 21, 2007. This response is in accordance with the requirements of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

Based on our review of the information provided with your request, we concur with your determination that the proposed action is not likely to adversely affect any federally listed species under our administration. Unless new information reveals effects of the proposed action that may affect listed or proposed species in a manner or an extent not considered, or a new species or critical habitat is designated or proposed that may be affected by the proposed action, no further action pursuant to the Endangered Species Act of 1973, as amended, is necessary.

Jim Browning
Senior Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825

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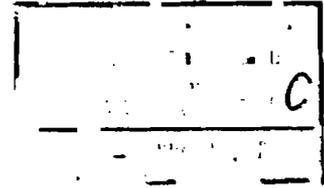


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3901

June 11, 2007



Ryan Olah
Chief, Endangered Species Division
U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Subject: Request for Informal Consultation under Section 7 of the Federal Endangered Species Act for the Proposed Russell City Energy Center - Hayward, California

Dear Mr. Olah:

By this letter, the United States Environmental Protection Agency, Region 9 ("Region 9") requests informal consultation and concurrence under Section 7 of the federal Endangered Species Act ("ESA") for the proposed Russell City Energy Center ("Russell City"). Calpine/GE Capital ("applicant") is proposing to construct a 600 megawatt natural gas fired power plant in Hayward, Alameda County, California. The applicant has applied to the Bay Area Air Quality Management District ("BAAQMD") for a permit for its project in part to meet the requirements of the federal Prevention of Significant Deterioration ("PSD") program.

The Bay Area Air Quality Management District ("District") has been delegated authority by Region 9 to issue federal PSD permits pursuant to Title 40 Code of Federal Regulations, Part 52.21. Therefore the issuance of a PSD permit by BAAQMD is considered a federal action. Region 9 is responsible for complying with ESA Section 7 requirements with respect to federal PSD permitting. Thus, Region 9 must ensure that issuance of the PSD permit to the applicant is not likely to jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of critical habitat of such species.

On September 11, 2002, the California Energy Commission ("CEC") approved a license for Calpine Corporation to construct Russell City. Region 9 was at that time in formal consultation with the US Fish and Wildlife Service to incorporate mitigation measures into the project plans that would take into account the projects' potential effects on wetlands and listed species, including the endangered salt marsh harvest mouse (*Reithrodontomys raviventris*), the California clapper rail (*Rallus obsoletus longirostris*), the California least tern (*Sterna antillarum browni*), and the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*) which are protected pursuant to the ESA of 1973, as amended. In the spring of 2003, Calpine withdrew plans to construct Russell City and as a result of this, the Section 7 consultation was not completed, the Service did not finalize a Biological Opinion for the project and BAAQMD

PROOF OF SERVICE (REVISED 10/10/07) FILED WITH

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did not issue a PSD permit.

Since that time, the applicant has proposed to relocate the Russell City facility approximately 1,200 feet to the north and west of their previous location. The new site will be located partly on land that has already been developed and is currently used for pallet storage, a metal fabricating business, a lumber and equipment storage yard, and automobile salvage. The nearest tidal marshes to the project are approximately 1,400 feet to the south and separated from the project by distribution warehouses. In its new location, Russell City would avoid impacts to seasonal wetlands and the protected species mentioned above.

The Region would like to begin an informal consultation with U.S. Fish and Wildlife Service ("FWS") regarding the proposed project. CH2M HILL, a consultant on the behalf of the project proponents, is the designated non-Federal representative who prepared a biological resources analysis ("analysis") as part of the applicant's Petition to Amend the CEC Decision (01-AFC-7C, issued September 11, 2002) for the Russell City Energy Center, which was submitted to the CEC on November 17, 2006. A copy of the analysis is attached to this letter. You can download the complete Petition at: http://www.energy.ca.gov/sitingcases/russellcity_amendment/documents/owner/2006-11_17_RCEC_AMENDMENT.PDF. Based upon our review of the analysis, we believe that the project will not adversely affect the special status species which have the potential to occur in the project area.

In summary, pursuant to Section 7 of the ESA, we request informal consultation and, if FWS agrees, concurrence in writing that the proposed project is not likely to adversely affect the special status species identified in the enclosed analysis. We look forward to working with you on this matter. If you have any questions, please contact Emmanuelle Rapicavoli of my staff at (415) 972-3969.

Sincerely,



Gerardo C. Rios
Chief, Permits Office

cc: Roger E. Johnson, CEC, Sacramento, CA
Barbara McBride, Calpine, Pleasanton, CA
Barry Young, Bay Area Air Quality Management District, San Francisco, CA
D. Davy (CH2M HILL)

3.2 Biological Resources

The proposed relocation of project facilities will eliminate biological resources impacts that would have occurred under the project as previously configured. The previous location contained seasonal wetlands that would have been filled to construct the project and the new location avoids these. In addition, the previous location was adjacent to pickleweed (*Salicornia*) marsh that is habitat for the federally endangered salt marsh harvest mouse and clapper rail and had the potential to cause adverse impacts to these species and their habitat.

Biological resources issues were addressed in the 2001 AFC and agency consultation with CEC, U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Game (CDFG). However, the relocation of the project facilities and associated linears, and the movement of the construction parking area, involves the potential disturbance of areas not previously considered. The following provides a supplemental assessment of the potential effects on biological resources associated with these changes as proposed in this license Amendment petition. This analysis also provides an update of the environmental baseline in terms of sensitive species database records for the project area.

3.2.1 Environmental Baseline Information

The newly proposed project site and construction parking areas are located on parcels that are approximately 1,300 feet northwest (300 feet boundary to boundary) from the proposed power plant site as described in the 2001 AFC, and are within the analysis area as described in the 2001 AFC (AFC Figure 8.2-3). The following subsections describe the biological conditions of the new areas proposed for project changes, including types of vegetation and habitat currently present and special-status species known to occur in the general region.

3.2.1.1 Habitat and Vegetation Communities

The habitat potentially affected in the new project location area can be characterized as mixed-used industrial, and includes a metal shop, a pallet storage area, and automobile salvage yard. With the exception of scattered ruderal areas, most of the properties are devoid of vegetation. The ruderal areas are highly disturbed and characterized with non-native grasses and forbs. The new project location area does not include seasonal wetlands or other potential federal-listed vernal pool branchiopod habitat.

The habitat that would be temporarily affected by a new construction parking and laydown area can also be characterized as mixed-used industrial, and includes a former metal fabricating business (Runnels Industries) and a vacant lot (eastern portion of City of Hayward parcel). The Runnels property is mostly devoid of vegetation and is highly disturbed with a scattering of some ruderal areas. The ruderal areas are characterized with non-native grasses and forbs and was previously surveyed for the AFC. The City of Hayward parcel is characterized by ruderal vegetation with scattered coyote brush (*Baccharis pilularis*) shrubs. There are some former soil stockpile areas, and a few open gravel areas located at the site. The additional construction parking and laydown areas do not include seasonal wetlands or other potential federal-listed vernal pool branchiopod habitat.

3.2.1.2 Special-status Species

The AFC includes a list of special-status plant and wildlife species compiled for the project area based upon the following references: (1) the CDFG California Natural Diversity Data Base (CNDDDB), (2) a USFWS species list for the area, (3) informal consultations with USFWS agency personnel, and (4) project-specific field surveys. Both the USFWS list and CNDDDB were updated for this Amendment.

The 2001 AFC included the results of a CNDDDB search of the San Leandro, Hayward, Newark, and Redwood Point 7.5-minute USGS topographical quadrangles. The results for the October 2006 CNDDDB search are included in Figure 3.2-1. The 2006 CNDDDB search results do not warrant the assessment of any special-status species not already included in the 2001 AFC or suggest the need for additional impact analysis of species included in the 2001 AFC.

Supplementary reconnaissance-level field surveys were performed by CH2M HILL biologist Russell Huddleston on September 14, 2006 to characterize the biological resources for the additional project features addressed in this Amendment. A resume indicating Mr. Huddleston's qualifications are provided in Appendix 3.2.

3.2.1.2.1 Special-status Plants

The 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 CNDDDB search conducted for this Amendment resulted in two additions to this list as seen in Table 3.2-1. In addition, 8 of the species on the 2001 list are not present on the 2006 list.

TABLE 3.2-1
Special-Special-Status Plants Potentially Occurring Within the Project Area

| Scientific Name | Common Name | Federal/State Status | Habitat Description | Potential for Species to Occur |
|--|---------------------|----------------------|---|---|
| <i>Chorizanthe robusta</i> var. <i>robusta</i> | Robust spinneflower | FE/None/1B | Cismontane woodland, coastal dunes, coastal scrub. | No suitable habitat in the project area |
| <i>Sanicula maritime</i> | Adobe sanicle | None/Rare/1B | Meadows and seeps, valley and foothill grassland, chaparral, coastal prairie. | No suitable habitat in the project area |

FE = Federally endangered

Based on the survey performed in September 2006, it was determined that suitable habitat for both of these plants is not available on the project site, and no additional consideration for project impacts is needed. No special-status plant species were observed in the project survey areas during protocol-level surveys conducted in support of the 2001 AFC and no evidence of these plant species was discovered during field reconnaissance for this Amendment, either within the power plant location or in the newly identified construction parking and laydown area.

TABLE 3.2-2
Special-Special-Status Wildlife Potentially Occurring Within the Project Area

| Scientific Name | Common Name | Federal/State Status | Habitat Description | Potential for Species to Occur |
|----------------------------------|----------------------------|----------------------|---|---|
| Fish | | | | |
| <i>Eucyclogobius newberryi</i> | Tidewater Goby | FE/None | Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego Co. to the mouth of the Smith River. Found in Shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels. | No suitable habitat in the project area |
| Invertebrates | | | | |
| <i>Lepidurus packardii</i> | Vernal Pool Tadpole Shrimp | FE/None | Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. | No suitable habitat in the project area |
| Mammals | | | | |
| <i>Scapanus latimanus parvus</i> | Alameda Island mole | None/CSC | Only known from Alameda Island. Found in a variety of habitats, especially annual and perennial grasslands. | No suitable habitat in the project area |

FE = Federally endangered
 CSC = California Species of Concern

3.2.1.2.2 Special-status Wildlife

The analysis conducted for the 2001 AFC indicated that, at that time, 50 special-status wildlife species had the potential to occur in the general project area. A new CNDDDB search conducted for this Amendment resulted in three additions to this list as seen in Table 3.2-2. In addition, 25 of the species on the 2001 list are not present on the 2006 list.

Based on the survey performed in September 2006, it was determined that suitable habitat for these special-status wildlife was not available, and no additional consideration for project impacts was needed. No special-status wildlife species were observed in the project survey areas during protocol-level surveys conducted in support of the 2001 AFC and no evidence of these wildlife species was discovered during field reconnaissance for this Amendment, either on the power plant location or in the newly identified construction parking and laydown area.

3.2.1.3 Biological Surveys

The biological resources evaluation is primarily based on the biological field surveys, agency consultation, and resulting analysis performed in support of the 2001 AFC. Supplementary field surveys were performed for this Amendment as described above, to characterize the biological resources for the additional construction laydown area addressed in this Amendment.

As with the initial field surveys, the 2006 reconnaissance-level biological surveys focused on characterization and potential impacts associated with vegetation communities, wetlands,

wildlife, and wildlife habitats in the vicinity of the new temporary and permanent impact areas. The field surveys were aided by aerial photographs, which helped identify land uses on the site and surrounding areas. The presence or potential presence of sensitive biological resources was determined from the former biological studies, the 2006 field surveys, and natural resource agency databases. A list of plant species observed during the 2006 biological surveys is included in Table 3.2-3. A list of wildlife species observed during the 2006 biological surveys is included in Table 3.2-4.

TABLE 3.2-3
Plant Species Observed During the Biological Reconnaissance Visits of the RCEC Project Area

| Common Name | Scientific Name | Sign |
|----------------------|--|----------|
| Wild Oat | <i>Avena fatua</i> | Observed |
| Italian ryegrass | <i>Lolium multiflorum</i> | Observed |
| Foxtail barley | <i>Hordeum murinum</i> ssp. <i>leporinum</i> | Observed |
| Bermuda Grass | <i>Cynodon dactylon</i> | Observed |
| Smilo grass | <i>Piptatherum millaceum</i> | Observed |
| Pampas grass | <i>Cortaderia</i> sp. | Observed |
| Bristly ox-tongue | <i>Picris echioides</i> | Observed |
| Bindweed | <i>Convolvulus arvensis</i> | Observed |
| Coyote brush | <i>Baccharis pilularis</i> | Observed |
| Wild mustard | <i>Brassica</i> sp. | Observed |
| Mallow | <i>Melva neglecta</i> | Observed |
| Curly dock | <i>Rumex crispus</i> | Observed |
| Slender tarweed | <i>Madia gracillia</i> | Observed |
| Fennel | <i>Foeniculum vulgare</i> | Observed |
| Fireweed | <i>Epilobium</i> sp. | Observed |
| Scattered nut sedge | <i>Cyperus</i> sp. | |
| Eucalyptus | <i>Eucalyptus globulus</i> | Observed |
| Himalayan blackberry | <i>Rubus discolor</i> | Observed |
| Cattail | <i>Typha</i> sp. | Observed |
| Tule | <i>Schoenoplectus acutus</i> | Observed |
| Bulrush | <i>S. robustus</i> | Observed |

TABLE 3.2-4
Wildlife Species Observed During the Biological Reconnaissance Visits of the RCEC Project Area

| Common Name | Scientific Name | Location | Sign |
|---------------------------|----------------------------------|--|----------|
| Birds | | | |
| American Crow | <i>Corvus brachyrhynchos</i> | Flying over general vicinity | Observed |
| Great egret | <i>Casmerodius albus</i> | Flying near sediment ponds west of Depot Road | Observed |
| Black-neck stilt | <i>Himantopus mexicanus</i> | In and around waste water treatment ponds | Observed |
| Mourning dove | <i>Zenaida macroura</i> | Flying overhead | Observed |
| Brewer's blackbird | <i>Euphagus cyanocephalus</i> | Waste water treatment plant – often around ponds | Observed |
| Belding's savanna sparrow | <i>Passerculus sandwichensis</i> | Associated with ruderal vegetation on City Property north of Enterprise Ave. | Observed |
| Canada goose | <i>Branta canadensis</i> | In and around waste water treatment ponds | Observed |
| Gulls | <i>Larus spp.</i> | Flying over general vicinity | Observed |
| Killdeer | <i>Charadrius vociferus</i> | Waste water treatment plant – often around ponds | Observed |
| Mallard | <i>Anas platyrhynchos</i> | In and around waste water treatment ponds | Observed |
| Mammals | | | |
| Domestic dog | <i>Canis familiaris</i> | Parcel north of water treatment facility – belongs to one of the workers at the site | Observed |

3.2.2 Environmental Consequences

In the 2001 AFC, potential direct and indirect impacts to biological resources were evaluated to determine the permanent and temporary effects of project construction, operation, maintenance, and decommissioning of the RCEC project and supporting facilities. The following includes an evaluation of the impacts associated with the proposed changes to the original project.

3.2.2.1 Standards of Significance

As with the 2001 analysis, impacts on biological resources are considered significant if one or more of the following conditions could result from implementation of the proposed project:

- Substantial effect, reduction in numbers, restricted range, or loss of habitat for a population of a state or federally listed threatened or endangered species
- Substantial effect, reduction in numbers, restricted range, or loss of habitat for a population of a California special-status species, including fully protected, candidate proposed for listing, California Species of Concern (CSC), and some California Native Plant Society (CNPS) list designations

- Substantial interference with the movement of resident or migratory fish or wildlife species
- Substantial reduction of habitat for native fish, wildlife, or plants
- Substantial disturbance of wetlands, marshes, riparian woodlands, and other wildlife habitat
- Removal of trees designated as heritage or significant under County or local ordinances

3.2.2.2 Potential Impacts from Moving Project Location and Construction Parking and Laydown Areas

Moving the project location will result in permanent impacts to approximately 18.8 acres. The area is currently disturbed, the dominant vegetation is non-native ruderal, and the parcels are currently being used for sewage drying, pallet storage, auto wrecking yards, and a metal fabricating shop. The quality of land as wildlife habitat is negligible as most of the properties are devoid of vegetation.

Use of the additional construction parking and laydown areas will result in temporary impacts to approximately 9.1 acres. These areas are currently disturbed, the dominant vegetation is non-native ruderal, and the parcels are currently being used for equipment and materials storage (Runnels Industries) or as vacant land (City of Hayward). Although the quality of the land as wildlife habitat is marginal, it could be used seasonally by foraging birds, small mammals, and reptiles. These properties may require temporary gravel placement to support materials and equipment and will likely be reclaimed for storage following project completion.

3.2.2.2.1 Special-Status Species

No special-status species have been observed or recorded by past project-specific database searches or surveys for the project area. The additional laydown area does not include unique habitat features that provide habitat for special-status species not addressed in the 2001 AFC. The additional laydown area does expand the temporary disturbance acreage of the overall project.

The project as previously configured was located adjacent to salt marsh habitat for the endangered salt marsh harvest mouse and clapper rail. Formal consultation with the USFWS regarding potential effects on these species was underway at the time that Calpine announced project suspension and a Biological Opinion was never issued. Because the project under the new configuration described in this Amendment is not located adjacent to salt marsh habitat, the new project will eliminate impacting these listed species, and consultation with the USFWS is not longer necessary.

3.2.2.2.2 Wetlands and Waters of the U.S.

No jurisdictional wetlands or waters are present within the new project location or the construction parking and laydown area. An excavated drainage ditch, which is a part of the Alameda County Flood Control District's storm water system, is present approximately 15 feet west the project area. The drainage is approximately 15 to 20 feet wide and conveys storm water runoff to the north (see Figure 2.2-1).

Recycled water will be applied to the laydown area for dust control during construction. Additional erosion and sediment discharge would be potentially harmful to water quality of adjacent drainage ditches. The Applicant will be required to have a Storm Water Pollution Prevention Plan (SWPPP) as part of compliance with a construction National Pollutant Discharge Elimination System (NPDES) permit. The permit specifies best management practices (BMPs) to avoid sediment runoff and erosion that would otherwise cause water quality degradation.

The project as previously configured required the filling of seasonal wetlands. A mitigation plan was developed that involved creation of wetlands, preservation and restoration of adjacent uplands, and restoration of tidal flow to salt marsh habitat. Permits under Section 404 of the Clean Water Act were not finalized at the time that Calpine announced suspension of the project. The project under the new configuration described in this Amendment will not require the filling of seasonal wetlands or a Clean Water Act Section 404 permit.

3.2.2.2.3 Noise

Construction of the RCEC project will involve pile-driving and HRSG steam blow noise as described in Section 3.7 (Noise). Pile-driving and steam blow could impact sensitive species breeding areas and wildlife using the surrounding areas. Because the previous project location was adjacent to salt marsh habitat that is home to the endangered salt marsh harvest mouse and clapper rail, a construction noise mitigation plan was proposed to alleviate this concern. However, the new project location is approximately 1,400 feet north and 2,500 feet east of the salt marsh habitat area. Distribution warehouses are located to the south of the project location between the marsh area and the project site, providing a buffer from noise impacts. To the west, the nearest pickleweed salt marshes are about 2,500 feet distant, separated from the project site by the City of Hayward's sludge drying ponds and by former water treatment ponds that are generally filled with open water. Because of the additional distance and the warehouse buffer, construction noise impacts will not be as disruptive, and therefore a construction noise mitigation plan will not be needed.

3.2.2.2.4 Bird Collisions with Stacks and Onsite Switchyard

The proposed project will be located in an industrial setting surrounded to the north, south and east by warehouses, water treatment facilities, and mixed industrial uses (pallet storage, metal shops, automobile salvage yards). Sludge drying ponds associated with the City of Hayward's WPCF are located to the west of the project area. Given the industrial setting and limited foraging and nesting habitat surrounding the proposed project site, bird collisions with cooling towers and other project facilities are expected to be minimal.

3.2.3 Mitigation Measures

Additional mitigation measures (beyond those of the Commission Decision) are not required for this Amendment. The existing measures will be adequate and adopted for the revised project and construction plans. Section 3.2.6 contains suggested modifications to the Conditions of Certification.

3.2.4 Consistency with LORS

The construction and operation of the RCEC, as amended, will conform with all applicable LORS related to biological resources.

3.2.5 References Cited

California Energy Commission. 2002. Commission Decision, Russell City Energy Center, Application for Certification (01-AFC-7), Alameda County. California Energy Commission, Sacramento, California. September 11.

3.2.6 Conditions of Certification

BIO-10 Habitat Compensation – Condition of Certification BIO-12 requires a construction habitat compensation program to mitigate the loss of seasonal wetlands. Because of the reconfigured site location, however, the project will not require the filling of seasonal wetlands. Therefore, this Condition of Certification is no longer necessary and should be deleted.

~~BIO-10 The project owner shall provide 26.19 acres of habitat to compensate for the loss of upland, freshwater seasonal wetlands. To mitigate the permanent and temporary loss of habitat, the project owner shall:~~

- ~~1. Purchase 26.19 acres of habitat adjacent to the proposed RCEC site;~~
- ~~2. Donate the 26.19 acres of habitat to the East Bay Regional Park District ("EBRPD");~~
- ~~3. Assist in arranging a long term lease to the EBRPD for 30 acres of salt marsh habitat owned by the City of Hayward;~~
- ~~4. Provide a suitable endowment fund to the EBRPD to manage the proposed habitat compensation and the City of Hayward property in perpetuity;~~
- ~~5. Implement the terms of the Agreement between EBRPD and the Russell City Energy Center LLC, to the extent such terms are consistent with the terms and conditions of this decision; and~~
- ~~6. Record, with the deed to the 26.19 acres of habitat compensation, an appropriate instrument containing such covenants as will benefit EBRPD and restrict use of the land as an enhanced wetland consistent with the terms and conditions of this decision. Such restriction shall be for the duration of the enhancement and monitoring activities specified in Section 1.2 of the Agreement between EBRPD and the Russell City Energy Center LLC.~~

Verification:

- ~~1. No less than 30 days prior to any site mobilization activities, the project owner shall provide written verification to the CPM that the required habitat compensation has been purchased and the restricting covenants recorded.~~
- ~~2. No more than 90 days after completion of the enhancement actions specified in Section 1.2 of the Agreement between the Russell City Energy Center LLC and the EBRPD, and their approval by the regulatory agencies, the project owner must provide written verification to the CPM that the Applicant has provided to the EBRPD a fee simple deed to the 26.19 acre parcel.~~

~~3. No less than 30 days prior to the start of construction of permanent structures, the project owner shall provide written verification to the CPM that the Applicant has paid to the EBRPD the first payment of \$300,000. Thereafter, as each subsequent payment is made to the EBRPD in accordance with the terms of the Agreement between RCEC and EBRPD, the project owner shall provide written verification to the CPM within 30 days after each payment is made.~~

~~4. BIO-10 is independent of, and is not intended to change, the contractual rights and obligations of the Agreement between RCEC and EBRPD.~~

BIO-12 Construction Noise – Condition of Certification BIO-12 requires a construction noise mitigation program to protect the endangered salt marsh harvest mouse and clapper rail. Because of the reconfigured site location, however, the nearest pickleweed salt marsh habitat is approximately 1,400 feet south of the project site, not adjacent to the site as with the project as previously configured. A distribution warehouse is located between the marsh and the reconfigured location, providing an industrial buffer zone between the project and sensitive species. To the west, the nearest pickleweed salt marshes are about 2,500 feet distant, separated from the project site by the City of Hayward's sludge drying ponds and by former water treatment ponds that are generally filled with open water. Therefore, this Condition of Certification is no longer necessary and should be deleted.

~~BIO-12 The project owner will develop an approved construction noise mitigation plan that addresses how noise impacts to state and federally listed nesting and breeding sensitive vertebrate species will be minimized during construction.~~

~~The noise mitigation plan will discuss how pile driving and HRSG steam blow noise will be mitigated. Regarding operational noise, the project owner shall provide written confirmation from EBRPD indicating that the habitat compensation endowment is sufficient to fund a predator management program for the life of the project. The final plan must be approved by the USFWS, CDFG, EBRPD, and Staff.~~

~~Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner will provide to the Energy Commission CPM with a copy of the final, agency approved construction and operational noise mitigation plan and a signed letter from EBRPD indicating that the endowment agreement is sufficiently large to fund a predator management program.~~

BIO-14 Perch Deterrent – Condition of Certification BIO-14 requires a raptor Perch Deterrent Management Plan to protect the endangered salt marsh harvest mouse from predation by raptors. Because of the reconfigured site location, however, the project structures are no longer located adjacent to the salt marsh habitat of the endangered salt marsh harvest mouse. The new location is separated from the salt marsh by industrial buildings and will not provide opportunities for raptors to perch and prey on the salt marsh harvest mouse. For this reason, a raptor perch management program is no longer necessary and Condition of Certification BIO-14 should be deleted.

~~BIO-14 The project owner shall provide a final, approved Perch Deterrent Management Plan. The Perch Deterrent Management Plan shall:~~

- ~~1. Be approved by the USFWS, CDFG, EBRPD and Staff;~~
- ~~2. Identify how landscaping will deter perching, nesting/roosting of raptors and crows;~~

~~3. Identify how the effectiveness of perch deterrents will be monitored and evaluated;~~
~~and~~

~~4. If needed, identify all measures to be implemented in the adaptive management plan, should monitoring indicate that perch deterrents are ineffective.~~

~~Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner will provide to the Energy Commission CPM a final approved version of the Perch Deterrent Management Plan. The final Perch Deterrent Management Plan shall be included in the RCEC Biological Resources Mitigation Implementation and Monitoring Plan.~~

BIO-15 Wetland Mitigation – Condition BIO-15 provides for a plan to mitigate the filling of wetlands on the KFAX site. The reconfigured project will avoid these wetlands, however, so Condition of Certification BIO-15 is no longer applicable and should be deleted.

~~BIO-15 The project owner shall provide a final, approved Wetland Mitigation Plan.~~

~~The Wetland Mitigation Plan shall:~~

~~1. Be approved by USFWS, USACE, RWQCB, EPA, CDFG, EBRPD and Staff;~~

~~2. Identify the timing, locations and all measures to be implemented for creation, preservation and enhancement activities;~~

~~3. Include the hydrological modeling analysis and all construction drawings to be used in support of dredging and levee removal and reduction activities; and~~

~~4. Identify performance criteria to be used in evaluating effectiveness of wetland mitigation measures.~~

~~Verification: No less than 60 days prior to any ground disturbance activities, the project owner shall provide to the Energy Commission CPM a final, approved copy of the Wetland Mitigation Plan. The final Wetland Mitigation Plan shall be included in the RCEC Biological Resources Mitigation Implementation and Monitoring Plan.~~

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

**Amendment to the APPLICATION
FOR CERTIFICATION OF THE
RUSSELL ENERGY CENTER
POWER PLANT PROJECT**

**Docket No. 01-AFC-7C
PROOF OF SERVICE
(Revised 6/6/07)**

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

**CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 01-AFC-7C
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
doCKET@energy.state.ca.us**

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DECLARATION OF SERVICE

I, Diana Tercero, declare that on June 27, 2007, I deposited copies of the attached Request for Informal Consultation under Section 7 of the Federal Endangered Species Act for the Proposed RCEC in the United States mail at Sacramento, CA with first-class postage thereon fully prepaid and addressed to those identified on the Proof of Service list above.

OR

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

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

Diana Tercero

8.2 BIOLOGICAL RESOURCES

This section describes biological resources in the vicinity of the Russell City Energy Facility (RCEC) and the Advanced Wastewater Treatment (AWT) Plant, and the potential effects of the project on them. Section 8.2.1 discusses the affected environment, including a regional overview of vegetation, sensitive plant communities, wetlands, wildlife, economically important wildlife species, and special status species. Section 8.2.1 also discusses methods and results of biological field surveys at the RCEC and AWT plant site, and along each of the linear facilities. Section 8.2.2 discusses the effects that construction and subsequent operation of the new facilities may have on special status plant and animal species and sensitive habitats. Section 8.2.3 evaluates any potential cumulative impacts to biological resources in the project vicinity and Section 8.2.4 addresses proposed mitigation measures. Section 8.2.5 presents applicable laws, ordinances, regulations and standards (LORS). Section 8.2.6 presents agency contacts and Section 8.2.7 presents permit requirements and schedules. Section 8.2.8 contains references.

8.2.1 Affected Environment

Coastal habitats along the eastern shore of San Francisco Bay include salt marshes, brackish sloughs, coastal prairies, and coastal sage scrub communities. The largest salt marsh community in California is located around San Francisco Bay. Community types in the project study areas include coastal salt marsh, brackish sloughs, mud flats, emergent marsh, and annual grassland.

8.2.1.1 Regional Biological Resources

The proposed RCEC project is located on the alluvial coastal plain of the San Francisco Bay. The alluvial coastal plains have been largely converted to urban development, salt evaporation ponds, or ruderal (disturbed and weedy) areas. Remnants of the historic northern coastal salt marsh complex remain protected in parks and preserves (Figure 8.2-1). These include the Hayward Regional Shoreline (west of the project site), the San Leandro Shoreline Park and Oyster Bay Regional Shoreline (northwest of the project site), the San Francisco Bay National Wildlife Refuge (south of the project site), and Coyote Hills Regional Park (southeast of the project site). Other biological resources include brackish sloughs such as Alameda Creek, and brackish marshes and abandoned salt evaporation ponds with the potential for restoration.

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.

8.2.1.2 Vegetation

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. Approximately one-half of the area within a 1-mile radius of the RCEC consists of urbanized and industrial areas within the City of Hayward. The other half consists primarily of northern coastal salt marsh and brackish sloughs that have been variously preserved, converted to other uses (sewage treatment facilities, landfills, and salt evaporation ponds), or are undergoing restoration.

The dominant vegetation types at the RCEC and AWT plant site are annual grassland and seasonal wetland dominated by saltgrass (*Distichlis spicata*), and alkali heath (*Frankenia salina*). The transmission line corridor, natural gas pipeline, and water pipelines cross urban landscapes dominated by ruderal species (i.e., weedy plants that grow in disturbed areas) and horticultural trees and shrubs.

8.2.1.3 Sensitive Plant Communities

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*).

8.2.1.4 Wetlands

There are 1.68 acres of seasonal wetlands on the 14.7-acre project site. 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. Creeks and sloughs draining into the Bay include Mt. Eden Creek and two unnamed sloughs draining into Hayward Landing and Johnson Landing.

8.2.1.5 Wildlife

Wildlife habitat on or within 1 mile of the project site and consists of urban land, marginal freshwater/brackish marsh communities, and the highly diverse northern coastal salt marsh communities of the Cogswell Marsh and the HARD Marsh. Listed species in the northern coastal salt marsh community include the salt marsh harvest mouse (*Reithrodontomys raviventris*), clapper rail (*Rallus longirostris obsoletus*), and salt-marsh wandering shrew (*Sorex vagrans halicoetes*).

8.2.1.6 Economically Important Wildlife Species

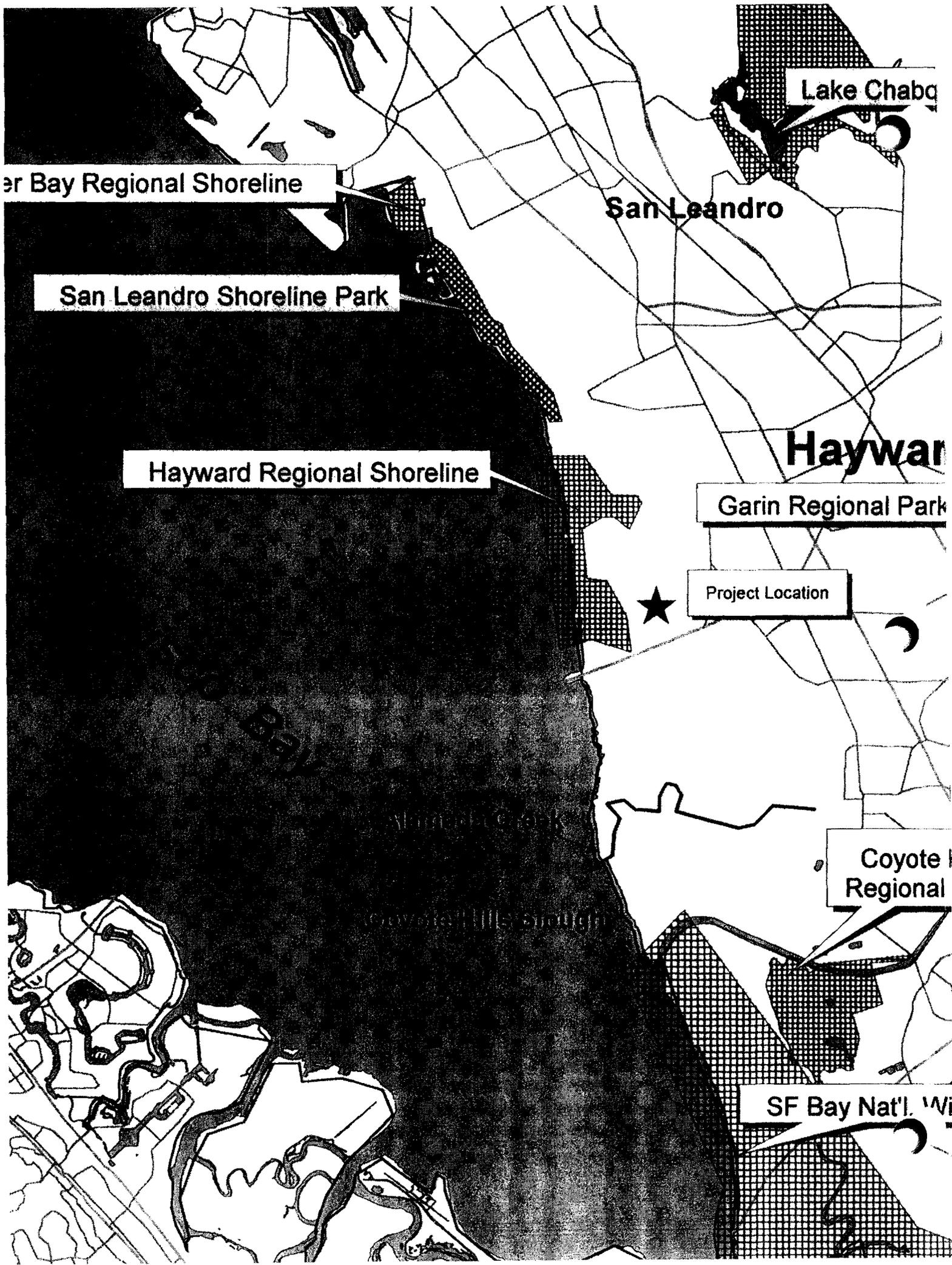
There are no economically important terrestrial wildlife species within the impact area of the proposed project.

8.2.1.7 Special Environmental Areas in Project Vicinity

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.

8.2.1.8 Special Status Species

The designation of special status includes all state- and federally-listed species under the state and federal Endangered Species Acts (ESAs); species proposed for those listings; federal Species of Concern (SC); California Species of Special Concern (CSC); California Fully Protected species under the Fish and Game Code; and plant species designated as Rare, Threatened, or Endangered by the California Native Plant Society (CNPS). Species of concern include those that could be listed in the future and those currently protected under other laws (e.g., the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act).



Lake Chabocan

San Francisco Bay Regional Shoreline

San Leandro

San Leandro Shoreline Park

Hayward Regional Shoreline

Hayward

Garin Regional Park

Project Location

Coyote Hills Regional

SF Bay Nat'l. Wildlife Refuge

Alameda Creek

Coyote Hills Slough

Standard references used for the biology and taxonomy of plants and plant communities included California Department of Fish and Game (1999); Hickman, ed. (1993); Holland (1986); Mason (1957); Munz (1959); and Skinner and Pavlik, eds. (1994). Standard references used for the biology and taxonomy of wildlife included Behler and King (1979); Ehrlich et al. (1988); Jameson and Peeters (1988); Jennings and Hayes (1994); Mayer and Laudenslayer, eds. (1988); McGinnis (1984); Peterson (1990); Stebbins (1985); Udvardy (1977); Verner and Boss (1980); Whitaker (1980); and Zeiner et al. (1988; 1990 a, b).

A computerized search of the California Natural Diversity Data Base (CNDDDB/RareFind report, February 2001) was conducted for the San Leandro, Hayward, Newark, and Redwood Point USGS topographic quadrangles (the "study Area"). This search was conducted to determine if there were any occurrences of state- or federally-listed species recorded within or near the project study area. Known locations of special status species, based on the database search, are mapped on Figure 8.2-2. Appendix 8.2-A contains the CNDDDB report. In addition to the CNDDDB/RareFind report, a letter was sent to the U.S. Fish and Wildlife Service (USFWS), Sacramento Field Office, requesting file data on special status species that could occur in the project vicinity. The USFWS response is presented in Appendix 8.2-B.

In addition to the literature sources mentioned above, site-specific information was gathered during field surveys conducted in the spring of 2001 (Section 8.2.1.10).

Special Status Plants

Table 8.2-1 lists the special status plant species in the vicinity of the project components, based on CNDDDB/RareFind and USFWS data. Brief descriptions of special status plant species that may occur in the project area are presented below. Habitat for these species occurs near the proposed project site.

Alkali milk-vetch (*Astragalus tener* var. *tener*)

- **Habitat and Biology:** Annual herb; CNPS List 1B; that occurs in coastal marsh and other alkaline habitats, such as playas, adobe clay valley and foothill grasslands, and alkaline vernal pools (Skinner and Pavlik 1994).
- **Blooming:** March to June
- **Range:** Sea level to 300 feet above msl. Known from Alameda, Contra Costa, Merced, Monterey, Napa, San Benito, Santa Clara, San Francisco, San Joaquin, Solano, Sonoma, Stanislaus, and Yolo counties.
- **CNDDDB/RareFind Records:** There are six records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. There is one extirpated record within the project impact area, mapped 0.3 miles west of the Southern Pacific Railroad adjacent to the transmission lines.
- **Habitat Present in Study Area:** Habitat for this species occurs in the RCEC and AWT plant site.

Table 8.2-1. Special status plant species potentially occurring in the RCEC project area.

| Scientific Name | Common Name | Federal/ State/ CNPS ^a | Source ^b | Habitat in impact area? | Blooms |
|--|-------------------------|---|---------------------|-------------------------------|----------|
| <i>Astragalus tener</i> var. <i>tener</i> | Alkali milk-vetch | SC/--/1B | 1,2 | Yes | Mar-May |
| <i>Atriplex depressa</i> | Brittlescale | SC/--/1B | 1 | No | May-Oct |
| <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> | Big-scale balsamroot | --/--/1B | 2 | No | Mar-June |
| <i>Cordylanthus maritimus</i> ssp. <i>palustris</i> | Point Reyes bird's-beak | SC/--/1B | 1 | Yes | Jun-Oct |
| <i>Cordylanthus mollis</i> ssp. <i>hispidus</i> | Hispid bird's beak | SC/R/1B | 2 | Marginal | Jul-Sep |
| <i>Fritillaria liliacea</i> | Fragrant fritillary | SC/--/1B | 2 | No | Feb-Apr |
| <i>Helianthella castanea</i> | Diablo rock rose | SC/--/1B | 1 | No | Apr-Jun |
| <i>Hemizonia parryi</i> ssp. <i>congdonii</i> | Congdon's tarplant | SC/--/1B | 2 | No | Jun-Nov |
| <i>Horkelia cuneata</i> ssp. <i>sericea</i> | Kellog's horkelia | SC/--/1B | 2 | No | Apr-Sept |
| <i>Lasthenia conjugens</i> | Contra Costa goldfields | E/--/1B | 1,2 | No | Mar-Jun |
| <i>Lathyrus jepsonii</i> | Delta tule pea | SC/--/1B | 1 | Marginal | May-Jun |
| <i>Lilaeopsis masonii</i> | Mason's lilaeopsis | SC/R/1B | 1 | No | Apr-Oct |
| <i>Plagiobothrys glaber</i> | Hairless popcorn flower | SC/--/1A | 2 | Yes | Apr-May |
| <i>Suaeda californica</i> | California seablite | PE/--/1B | 1 | Marginal | Jul-Oct |

^a Status Categories:

Federal status determined from a USFWS letter (Knight 2001, personal communication). State status determined from *Special Plants List* (June 1999), and/or *State and Federally Listed Endangered, Threatened, and Rare Plants of California* (April 1999), prepared by CDFG Natural Diversity Data Base. CNPS status determined from *CNPS Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994). Codes used in table are as follows:

E = Endangered; T = Threatened; R = California Rare; PE = Proposed Endangered

C = Candidate: Taxa for which the USFWS has sufficient biological formation to support a proposal to list as endangered or threatened.

SC = USFWS Species of Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

SSC = CDFG "Species of Special Concern"

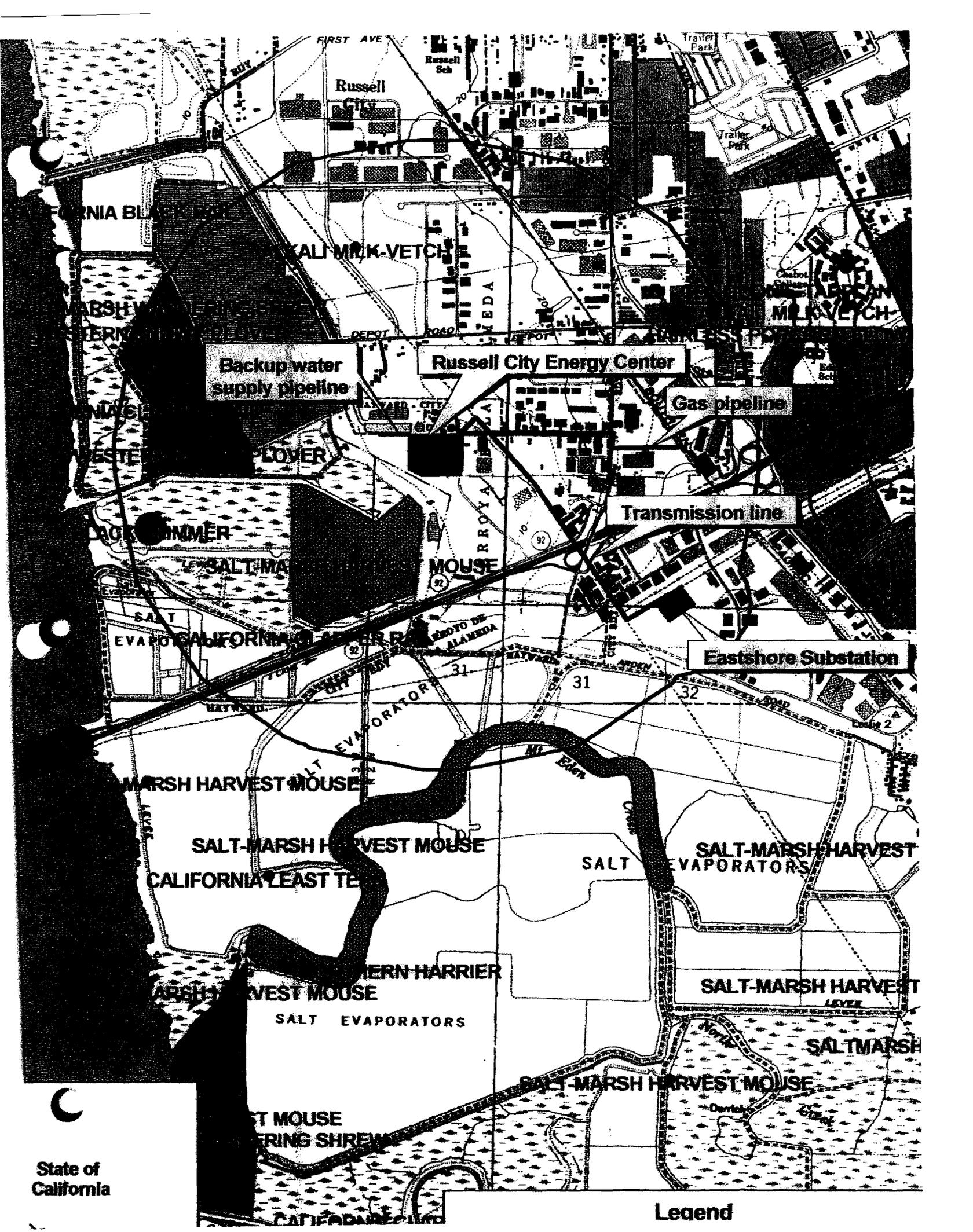
CNPS List: 1A = Presumed Extinct in CA; 1B = Rare or Endangered in CA and elsewhere; 2 = R/E in CA and more common elsewhere; 3 = Need more information; 4 = Plants of limited distribution.

-- = Species not state-listed.

^b Source: 1 = From USFWS letter (Knight 2001, personal communication). 2 = From CNDDB/ RareFind.

Hispid bird's beak (*Cordylanthus mollis* ssp. *hispidus*)

- **Habitat and Biology:** Annual herb, hemiparasitic; CNPS List 1B; alkaline meadows and playas.
- **Blooming:** June to September
- **Range:** Alameda, Kern, Merced, Placer, and Solano counties.
- **CNDDB/RareFind Records:** No records for this species on the USGS 7.5-minute San Leandro Quad.
- **Habitat Present in Study Area:** Marginal habitat occurs in alkaline soils in the project site and adjacent stormwater retention pond. Also in playas in Cogswell Marsh and HARD Marsh.



Backup water supply pipeline

Russell City Energy Center

Gas pipeline

Transmission line

Eastshore Substation

State of California

Legend

Point Reyes bird's beak (*Cordylanthus maritimus* ssp. *palustris*)

- **Habitat and Biology:** Annual herb; Federal SC and CNPS List 1B; found in coastal salt marshes associated with pickleweed, saltgrass, and jaumea.
- **Blooming:** June to October
- **Range:** Restricted to coastal salt marshes in California and Oregon.
- **CNDDDB/RareFind Records:** There are six records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads.
- **Habitat Present in Study Area:** Potential habitat for this species occurs in the salt marsh habitats in Cogswell Marsh and HARD Marsh.

Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)

- **Habitat and Biology:** Perennial herb; Federal SC, CNPS List 1B; found in brackish marsh (Skinner and Pavlik 1994).
- **Blooming:** May to June
- **Range:** Alameda, Contra Costa, Fresno, Marin, Napa, Sacramento, San Benito, Santa Clara, San Joaquin, and Solano counties.
- **CNDDDB/RareFind Records:** There are no records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads.
- **Habitat Present in Study Area:** Potential habitat occurs in brackish/freshwater marshes and sloughs in the western part of the project impact area.

Mason's lilaeopsis (*Lilaeopsis masonii*)

- **Habitat and Biology:** Perennial herb; State R, Federal SC, CNPS List 1B; found in brackish marshes, swamp areas, and riparian scrub (Skinner and Pavlik 1994).
- **Blooming:** April to October
- **Range:** South Sacramento Valley and northeast San Francisco Bay.
- **CNDDDB/RareFind Records:** No records on the USGS 7.5-minute San Leandro Quad.
- **Habitat Present in Study Area:** Potential habitat occurs in brackish/freshwater marshes and sloughs in the western part of the project impact area.

Hairless popcorn flower (*Plagiobothrys glaber*)

- **Habitat and Biology:** Annual herb; Federal Endangered and CNPS List 1A; found in meadows, seeps, marshes and swamps. Especially thought to prefer coastal salt marshes and alkaline meadows.
- **Blooming:** April to May
- **Range:** Isolated to alkaline meadows and coastal salt marshes in northern California.
- **CNDDDB/RareFind Records:** There are two records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads.
- **Habitat Present in Study Area:** Potential habitat occurs in alkaline soils in the project site.

California seablite (*Suaeda californica*)

- **Habitat and Biology:** Perennial shrub; Federal Endangered and CNPS List 1B; found along margins of coastal salt marshes.
- **Blooming:** July to October
- **Range:** Formerly known from San Francisco Bay area where thought to be extirpated. Currently known from Alameda, San Luis Obispo, and Santa Clara counties.

- **CNDDDB/RareFind Records:** There is one record for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads.
- **Habitat Present in Study Area:** Marginal habitat occurs along margins of alkaline soils of Cogswell Marsh and HARD Marsh.

Special Status Wildlife Species

Table 8.2-2 lists the special status wildlife species in the vicinity of the RCEC project components, based on CNDDDB/RareFind and USFWS data. Locations of species historically located within 1 mile of the RCEC project components are mapped on Figure 8.2-2. Brief descriptions of special status wildlife species that may occur in the project area are presented below in the following order: mammals, birds, reptiles, amphibians, fish, and invertebrates. Habitat for these species occurs near the project site, but does not occur on the plant site.

Mammals:

Salt-marsh harvest mouse (*Reithrodontomys raviventris*)

- **Habitat and Biology:** Forages on leaves, seeds, and stems of plants that occur in salt marsh habitats. In winter, this species prefers fresh green grasses. Pickleweed and saltgrass are the main food sources (Zeiner 1990). Does not burrow. Builds nests of grass and sedges on the ground.
- **Range:** Restricted to salt marsh habitats around San Francisco Bay.
- **CNDDDB/RareFind Records:** There are 24 records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. Two records occurred within the project vicinity; in the City of Hayward salt marsh southwest of the RCEC plant site, and along Mt. Eden Creek.
- **Nesting/Foraging Habitat Present in Study Area:** Breeding and foraging habitat for this species exists within the salt marsh habitats in Cogswell Marsh, the HARD Marsh, the City of Hayward salt marsh, and Mt. Eden Creek. Brackish marshes and salt evaporating ponds, provide marginal habitat for this species.

Salt-marsh wandering shrew (*Sorex vagrans halicoetes*)

- **Habitat and Biology:** Feeds mainly on invertebrates, insects, worms, snails, slugs, and spiders. Also eats fungi, small mammals, roots, young shoots, and probably seeds. Forages under litter on moist surfaces, underground, and in moist accumulations of dead plant material. Prefers dense litter or ground cover and uses vole runways.
- **Range:** Restricted to salt marsh habitats around San Francisco Bay.
- **CNDDDB/RareFind Records:** There are seven records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. One record occurred within the project vicinity, in the Cogswell Marsh.
- **Nesting/Foraging Habitat Present in Study Area:** Potential habitat for this species occurs in the Cogswell Marsh, the HARD salt marsh, and the City of Hayward Marsh southwest of the project site.

Table 8.2-2. Special status wildlife species evaluated in the RCEC project areas.

| Scientific Name | Common Name | Federal/ State ^a | Habitat in impact area? | Source ^b |
|--|------------------------------------|--------------------------------|----------------------------|---------------------|
| Mammals | | | | |
| <i>Corynorhinus townsendii townsendii</i> | Pacific western big eared bat | SC/CSC | No | 1 |
| <i>Eumops perotis californicus</i> | Greater western mastiff-bat | SC/CSC | No | 1 |
| <i>Myotis evotis</i> | Long eared bat | SC/-- | No | 1 |
| <i>Myotis thysanodes</i> | Fringed myotis bat | SC/-- | No | 1 |
| <i>Myotis volans</i> | Long legged myotis bat | SC/-- | No | 1 |
| <i>Myotis yumanensis</i> | Yuma myotis bat | SC/CSC | No | 1 |
| <i>Neotoma fuscipes annectens</i> | San Francisco dusky footed woodrat | SC/CSC | No | 1 |
| <i>Reithrodontomys raviventris</i> | Salt-marsh harvest mouse | E/E | Yes | 1,2 |
| <i>Sorex vagrans halicoetes</i> | Salt-marsh wandering shrew | SC/CSC | Yes | 1,2 |
| Birds | | | | |
| <i>Accipiter striatus</i> (nesting) | Sharp-shinned hawk | --/SSC | No | 2 |
| <i>Agelaius tricolor</i> (nesting colony) | Tricolored blackbird | SC/CSC | No | 1,2 |
| <i>Amphispiza belli belli</i> | Bell's sage sparrow | SC/CSC | No | 1 |
| <i>Aquila chrysaetos</i> (nesting & wintering) | Golden Eagle | --/SSC | No | 2 |
| <i>Ardea herodias</i> (rookery) | Great blue heron | --/-- | No | 2 |
| <i>Asio flammeus</i> (nesting) | Short-eared owl | --/SSC | No | 2 |
| <i>Athene cunicularia hypugea</i> (burrow sites) | Western burrowing owl | SC/CSC | Yes | 1,2 |
| <i>Branta canadensis leucopareia</i> | Aleutian Canada goose | T/-- | No | 1 |
| <i>Buteo regalis</i> | Ferruginous hawk | SC/CSC | Winter foraging | 1 |
| <i>Charadrius alexandrinus nivosus</i> (nesting) | Western snowy plover | T/CSC | No | 1,2 |
| <i>Circus cyaneus</i> (nesting) | Northern harrier | --/CSC | Yes | 2 |
| <i>Elanus leucurus</i> (nesting) | White-tailed kite | --/-- | Yes | 2 |
| <i>Falco peregrinus anatum</i> | American peregrine falcon | --/E | Yes-foraging | 1 |
| <i>Geothlypis trichas sinuosa</i> | Saltmarsh common yellowthroat | SC/CSC | No-foraging | 1,2 |
| <i>Haliaeetus leucocephalus</i> | Bald eagle | T/E | No | 1,2 |
| <i>Laterallus jamaicensis coturniculus</i> | California black rail | SC/T | No | 2 |
| <i>Melospiza melodia pusillula</i> | Alameda song sparrow | SC/CSC | Yes | 1 |
| <i>Pelecanus occidentalis californica</i> | California brown pelican | E/E | No | 1 |
| <i>Phalacrocorax auritus</i> | Double-crested cormorant | --/SSC | No | 2 |
| <i>Rallus longirostris obsoletus</i> | California clapper rail | E/E | No | 1,2 |
| <i>Rynchops niger</i> | Black Skimmer | --/SSC | Yes | 2 |
| <i>Riparia riparia</i> (nesting) | Bank swallow | --/T | No | 2 |
| <i>Sterna antillarum browni</i> (nesting colony) | California least tern | E/E | No | 1,2 |
| Reptiles | | | | |
| <i>Clemmys marmorata marmorata</i> | Northwestern pond turtle | SC/CSC | Marginal | 1 |
| <i>Clemmys marmorata pallida</i> | Southwestern pond turtle | SC/CSC | Marginal | 1 |

Table 8.2-2. (continued)

| Scientific Name | Common Name | Federal/State ^a | Habitat in impact area? | Source ^b |
|--|--|----------------------------|-------------------------|---------------------|
| Reptiles (cont.) | | | | |
| <i>Masticophis lateralis euryxanthus</i> | Alameda whipsnake | T/T | No | 1,2 |
| <i>Phrynosoma coronatum frontale</i> | California horned lizard | SC/CSC | No | 1 |
| Amphibians | | | | |
| <i>Ambystoma californiense</i> | California tiger salamander | C/CSC | No | 1 |
| <i>Rana aurora draytonii</i> | California red legged frog | T/CSC | No | 1 |
| <i>Rana boylei</i> | Foothill yellow legged frog | SC/CSC | No | 1 |
| Fish | | | | |
| <i>Hypomesus transpacificus</i> | Delta smelt | T/T | No | 1 |
| <i>Oncorhynchus kisutch</i> | Coho salmon | T/E | No | 1 |
| <i>Oncorhynchus mykiss</i> * | Central California Valley steelhead | T/E | No | 1 |
| <i>Oncorhynchus mykiss</i> * | Central California Coast steelhead | T/E | No | 1 |
| <i>Oncorhynchus tshawytscha</i> | Winter run chinook salmon | E/E | No | 1 |
| <i>Pogonichthys macrolepotus</i> | Sacramento splittail | PT/CSC | No | 1 |
| <i>Spirinchus thaleichthys</i> | Longfin smelt | SC/CSC | No | 1 |
| Invertebrates | | | | |
| <i>Branchinecta lynchi</i> | Vernal pool fairy shrimp | T/-- | No | 1 |
| <i>Danaus plexippus</i> | Monarch butterfly | --/-- | No | 2 |
| <i>Hydrochara rickseckeri</i> | Ricksecker's scavenger beetle | SC/-- | Marginal | 1 |
| <i>Tryonia imitator</i> | Mimic tryonia (California brackishwater snail) | SC/-- | Marginal | 2 |

^a Status Categories:

Federal status determined from the USFWS letter. State status determined from *State and Federally Listed Endangered and Threatened Animals of California* (January 1999) and *Special Animals* (March 1998), prepared by DFG Natural Diversity Data Base. Codes used in table are as follows:

E = Endangered; T = Threatened; R = California Rare; PT = Proposed Threatened

C = Candidate: Taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened.

SC = USFWS Species of Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

SSC = CDFG "Species of Special Concern"

FP = CDFG "Fully Protected"

CNPS List: 1A = Presumed Extinct in CA; 1B = Rare or Endangered in CA and elsewhere; 2 = R/E in CA and more common elsewhere;

3 = Need more information; 4 = Plants of limited distribution.

-- = Species not state-listed.

^b Source: 1 = From USFWS letter (Knight 2001, personal communication). 2 = From CNDDDB/ RareFind. 3 = Field observation.

* The *O. mykiss* taxon has an Ecological Significant Unit (ESU) designation, based on genetic isolation resulting from geographic separation.

Birds:

California clapper rail (*Rallus longirostris obsoletus*)

- **Habitat and Biology:** Forages in marsh vegetation, along vegetation and mud flat interface, and along creeks. Along coast, feeds on crab, mussels, clams, snails, insects, spiders, and worms. Will also take mice during high tides. Prefers emergent wetland vegetation dominated by pickleweed and cordgrass, and brackish emergent wetlands dominated by pickleweed, cordgrass, and bulrush. Requires shallow water and mudflats for foraging with adjacent higher vegetation for cover during high water periods.
- **Range:** Locally common year-long in coastal wetlands and brackish areas around San Francisco, Monterey, and Morro bays.
- **CNDDDB/RareFind Records:** There are 11 records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. This species is known to occur in the Cogswell Marsh and the HARD Marsh.
- **Nesting/Foraging Habitat Present in Study Area:** Suitable habitat for this species occurs in the salt marsh and brackish marsh habitats within the study area.

California black rail (*Laterallus jamaicensis coturniculus*)

- **Habitat and Biology:** Occurs most commonly in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass. Usually found in immediate vicinity of tidal sloughs. Typically occurs in high wetland zones near upper limit of tidal flooding, not in low wetland areas with considerable annual and/or daily fluctuations in water levels. During extreme high tides, may depend on upper wetland zone and adjoining upland or freshwater wetland vegetation for cover. Nests are concealed in dense vegetation, often pickleweed, near upper limits of tidal flooding.
- **Range:** Rarely seen, scarce, year-long resident of saline, brackish, and fresh emergent wetlands in the San Francisco Bay area, Sacramento-San Joaquin Delta, at Morro Bay and a few other coastal southern California locations, the Salton Sea area, and the lower Colorado River area.
- **CNDDDB/RareFind Records:** There are five records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. Only one of these records occurred within the project impact area, in the salt marsh near Hayward Landing.
- **Nesting/Foraging Habitat Present in Study Area:** Suitable habitat for this species occurs in the project area in the tidal sloughs in the vicinity of Hayward Landing and Johnson Landing.

Western burrowing owl (*Athene cunicularia hypugea*)

- **Habitat and Biology:** Forages day and night in open dry grassland and desert habitats, and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats. Nests in old burrows of ground squirrels or other small mammals. Eats mostly insects; also feeds on small mammals reptiles, birds, and carrion. Short vegetation may increase prey availability, enhance predator detection, and attract burrowing mammals that provide nest sites for burrowing owls. Burrowing owls usually migrate from their nesting site during the winter, but may use their burrow or other burrows as winter shelter. Breeds from March through August. Year-long resident in CA.
- **Range:** Central Valley, Sierra Nevada, and Coast ranges.

- **CNDDDB/RareFind Records:** There are eight records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads, none of which occurred within the project impact area.
- **Nesting/Foraging Habitat Present in Study Area:** Suitable nesting and foraging habitat for this species occurs in the Project site.

Reptiles:

Northwestern pond turtle (*Clemmys marmorata marmorata*) and Southwestern pond turtle (*Clemmys marmorata pallida*)

- **Habitat and Biology:** Associated with permanent or nearly permanent water in a wide variety of habitat types, normally in ponds, lakes, streams, irrigation ditches or permanent pools along intermittent streams (Zeiner et al. 1988). Eats aquatic plant material, aquatic invertebrates, fish, and frogs (Nussbaum et al. 1983; Stebbins 1985).
- **Range:** Northwestern pond turtles occur throughout northern California west of the Sierra Nevada (Stebbins 1985). Southwestern pond turtles occur from the San Francisco Bay region, south to northwestern Baja California, chiefly west of the Cascade-Sierran crest (Stebbins 1985).
- **CNDDDB/RareFind Records:** There are no records of either subspecies on the USGS 7.5-minute San Leandro Quad.
- **Nesting/Foraging Habitat Present in Study Area:** Suitable breeding and foraging habitat for this species exists within the emergent wetland habitats in the project vicinity.

8.2.1.9 Field Survey Methods

Biological field surveys for the RCEC project were conducted by biologist Brett D. Hartman on February 27 and March 25, 2001, and on April 24, 2001 by Brett D. Hartman and Dean Carrier (qualifications are presented in Appendix 8.2-C). The area surveyed included a 1-mile radius from the Project site, and at least 1,000 feet in each direction from the electric transmission line, natural gas supply pipeline, and wastewater pipeline rights-of-way centerlines. The Eastshore Substation and surrounding vacant land (site of the substation expansion) (Figure 8.2-3 in map pocket) were also surveyed. This section describes the field survey methods used to determine biological resources that could be affected by project activities and the results of those surveys for each of the project areas.

Additional surveys of the RCEC plant and plant AWT site, will be conducted in the late spring and summer of 2001. These surveys will be necessary to identify endangered and threatened flowering plants and migratory bird species that may not be present or readily identifiable in other seasons.

Vegetation

Vegetation surveys included the following tasks:

- Site surveys to determine the type and location of vegetation communities
- Vegetation mapping
- Preparation of plant lists

Activities associated with the special status plant species surveys included the following:

- Consultation with CDFG and USFWS regarding potential occurrence of state- and federally-listed plant species on or near the project area
- Determination of CNPS status of special status plant species using the CNPS electronic inventory (Skinner and Pavlik 1994)

- Determination of habitat preference and flowering times of special status plant species
- Field surveys of the RCEC and AWT plant site, transmission line corridor and substation extension site, natural gas pipeline route, and water supply and wastewater return pipelines, during February and March of 2001.

A list of plant species observed at the project site and linear facilities during 2001 botanical surveys is presented in Table 8.2-3. Due to their bloom time, certain species with potential habitat in the project area of potential effects could not be surveyed during the time in which this AFC was developed.

Additional surveys will be undertaken in June and July to determine whether or not Hispid's birds beak, Point Reyes bird's beak, or Delta tule pea are present in the project area and would be affected by project construction or operation. Of these, Point Reyes bird's beak and Delta tule pea are true salt marsh or brackish marsh species, or species unlikely to occur in more upland situations such as the RCEC power plant and AWT site. Hispid's bird's beak is more likely to be present than Point Reyes bird's beak or Delta tule pea, since this plant's natural habitat consists of alkaline playas and meadows and the project site contains alkaline soils near brackish marsh. Surveys for this plant could take place in June. California seablight also has a post-April blooming period, but is a perennial shrub that is identifiable outside of the blooming period.

Wildlife Surveys

Wildlife surveys for the RCEC project were conducted during the spring of 2001 by biologists Brett D. Hartman and Dean Carrier. Wildlife species were observed in the early morning and late afternoon hours at the project site, the open land belonging to Waste Management Corporation and the City of Hayward stormwater retention basin to the south of the power plant site, the Eastshore Substation and surrounding open land, and along the interpretive trails of the Cogswell Marsh and HARD Marsh. Trapping was not conducted for the salt marsh harvest mouse because of the lack of suitable habitat (pickleweed) on site. Habitat evaluation is the standard method for identifying the likely presence or absence of this species due to the unreliability of trapping as an indicator (Dan Buford, U.S. Fish and Wildlife Service, personal communication, April 30, 2001).

A list of wildlife species observed during surveys of the project site and associated facilities is provided in Table 8.2-4.

Wetland Delineation

A wetland delineation was performed for the RCEC and AWT plant site. Standard methodology as defined in the Corps of Engineers Wetlands Delineation Manual (1987) was used.

Wetland delineation included the following tasks:

- Review of available data on the site, including: National Wetlands Inventory map for the San Leandro quadrangle; Soil Survey of Alameda County, CA, Western Part (1981); and Hayward Shoreline Environmental Enhancement Program (HASPA, 1993)
- Field surveys of the project site on February 28, 2001, and completion of wetland data forms (Appendix 8.2-D)
- Aerial photo interpretation and delineation of wetlands on a 1-foot contour topographic map
- Consultation and field verification of the wetland delineation with Mark D'Ávignon of the Army Corps of Engineers, San Francisco District, on April 24, 2001

Table 8.2-3. Plant species observed during botanical surveys of the RCEC project.

| Family | Genus | Species/ subspecies/ variety | NI* | Common name | Power plant and AWT site | Natural Gas & Water Pipelines |
|-----------------|---------------------|---|------|--------------------|--------------------------------|----------------------------------|
| DICOTS | | | | | | |
| Apiaceae | <i>Foeniculum</i> | <i>vulgare</i> | I | Fennel | | |
| Asteraceae | <i>Conyza</i> | <i>canadensis</i> | I | Horseweed | ✓ | |
| | <i>Baccharis</i> | <i>pilularis</i> | N | Coyote brush | ✓ | |
| | <i>Cotula</i> | <i>coronopifolia</i> | I | Brassbuttons | ✓ | |
| | <i>Grindelia</i> | <i>Stricta</i> var. <i>angustifolia</i> | N | Gumweed | | |
| | <i>Sonchus</i> | <i>oleraceus</i> | I | Common sow thistle | ✓ | ✓ |
| Brassicaceae | <i>Brassica</i> | <i>nigra</i> | I | Black mustard | ✓ | ✓ |
| Chenopodiaceae | <i>Chenopodium</i> | <i>album</i> | I | Lamb's quarters | | |
| | <i>Salicornia</i> | <i>virginica</i> | N | Pickleweed | ✓ | |
| Fabaceae | <i>Lathyrus</i> | <i>Sp.</i> | N | Wild pea | ✓ | |
| Frankeniaceae | <i>Frankenia</i> | <i>salina</i> | N | Alkali heath | ✓ | |
| Geraniaceae | <i>Geranium</i> | <i>molle</i> | I | Wild geranium | ✓ | ✓ |
| | <i>Erodium</i> | <i>cicutarium</i> | I | Filaree | ✓ | ✓ |
| Malvaceae | <i>Malva</i> | <i>nicaeensis</i> | I | Bull mallow | ✓ | |
| Myrtaceae | <i>Eucalyptus</i> | <i>globulus</i> | I | Blue gum | | |
| Papaveraceae | <i>Eschscholzia</i> | <i>californica</i> | N | California poppy | | |
| Plantaginaceae | <i>Plantago</i> | <i>lanceolata</i> | I | English plantain | ✓ | ✓ |
| Polygonaceae | <i>Rumex</i> | <i>crispus</i> | I | Curly dock | ✓ | |
| Primulaceae | <i>Anagallis</i> | <i>arvensis</i> | I | Scarlet pimpernell | | |
| Solanaceae | <i>Nicotiana</i> | <i>glauca</i> | I | Tree tobacco | | |
| Urticaceae | <i>Urtica</i> | <i>urens</i> | I | Dwarf nettle | | |
| MONOCOTS | | | | | | |
| Poaceae | <i>Avena</i> | <i>fatua</i> | I | Wild oat | ✓ | ✓ |
| | <i>Bromus</i> | <i>diandrus</i> | I | Ripgut grass | ✓ | |
| | <i>Cortadaria</i> | <i>Sp.</i> | I | Pampas grass | | |
| | <i>Cynodon</i> | <i>dactylon</i> | I | Bermuda grass | | ✓ |
| | <i>Distichlis</i> | <i>spicata</i> | N | Saltgrass | ✓ | |
| | <i>Elymus</i> | <i>sp.</i> | | Wild-rye | ✓ | |
| | <i>Hordeum</i> | <i>murinum</i> ssp. <i>leporium</i> | I | -- | | |
| | <i>Lolium</i> | <i>multiflorum</i> | I | Italian ryegrass | ✓ | ✓ |
| | <i>Vulpia</i> | <i>microstachys</i> | N | Three-week fescue | ✓ | |
| Juncaceae | <i>Scirpus</i> | <i>sp.</i> | Rush | | | |

8.2.1.10 RCEC Plant Site Survey

The project site is bordered on the north by Enterprise Avenue and the City of Hayward Water Pollution Control Facility (or WPCF), on the east by Whitesell Street and the Mag Trucking terminal, on the south by an Alameda County Flood Control District stormwater channel and City of Hayward stormwater retention pond, and on the west by a warehouse and truck terminal/distribution center. Figure 8.2-3 (in map pocket) shows biological resources noted within 1 mile of the plant site and 1,000 feet of the project linear facilities.

Table 8.2-4. Wildlife species observed during 2001 wildlife surveys.

| Common Name | Power plant And AWT site | Transmission line | Natural gas pipeline |
|-----------------------|-----------------------------|-------------------|-------------------------|
| Alameda song sparrow | ✓ | | |
| Avocet | ✓ | ✓ | ✓ |
| Barn swallow | ✓ | | |
| Black-necked stilt | ✓ | | |
| Brewer's blackbird | ✓ | ✓ | ✓ |
| Canada goose | ✓ | | |
| Common Crow | ✓ | ✓ | ✓ |
| Common raven | ✓ | ✓ | |
| Cormorant (in flight) | ✓ | | |
| Killdeer | ✓ | | |
| Oadwall | ✓ | | |
| Great egret | ✓ | | |
| Least sandpiper | ✓ | | |
| Long-billed dowitcher | ✓ | | |
| Mallard | ✓ | | |
| Mourning dove | ✓ | ✓ | ✓ |
| Northern harrier | ✓ | | |
| Red-winged blackbird | ✓ | ✓ | |
| Red-tailed hawk | ✓ | | |
| Rock dove | ✓ | ✓ | ✓ |
| Ruddy duck | ✓ | ✓ | ✓ |
| Stacilia | ✓ | | |
| Turkey vulture | | | |
| Western Gull | ✓ | | |
| Western meadowlark | ✓ | | |

Vegetation

The project plant site is dominated by business/industrial development, annual grassland, and seasonal wetland vegetation (in addition to the industrial activities at the Runnels Industries parcel). Table 8.2-5 lists the approximate acreage of habitat types at the plant site. Annual grassland vegetation is dominated by introduced annual grasses such as ripgut brome (*Bromus diandrus*) and Italian wild rye (*Lolium multiflorum*), and ruderal species such as black mustard (*Brassica nigra*), bullmallow (*Malva nicaeensis*), and filaree (*Erodium cicutarium*). Two native grass species are present: three-week fescue

(*Vulpia microstachys*) and wild barley (*Hordeum leporinum*), with coyote brush (*Baccharis pilularis*) along the borders of the property.

Table 8.2-5. Habitat types affected at the Project site.

| Habitat type | Acres |
|--|-------------|
| Open industrial lot (Runnels Industries) | 3.6 |
| Grassland/ruderal areas | 9.4 |
| Wetland vegetation | 1.7 |
| Totals | 14.7 |

Seasonal wetland vegetation on the project site is dominated by salt-tolerant species such as saltgrass (*Distichlis spicata*) and alkalai heath (*Frankenia salina*), with curly dock (*Rumex crispus*), Italian ryegrass (*Lolium multiflorum*), wildrye (*Leymus* sp.) and spikerush (*Eleocharis* sp.) as associates. The City of Hayward's stormwater retention pond, located southwest of the project site, is dominated by pickleweed (*Salicornia virginica*) and brass buttons (*Cotula coronopifolia*), intermixed with uplands dominated by Italian ryegrass (*Lolium multiflorum*) and other ruderal species.

Wildlife

Wildlife species observed foraging at the Project site and adjacent stormwater retention pond included Canada geese, red-winged blackbirds, western gulls, mallards, and least sandpipers. Black-tailed jackrabbits and ground squirrel burrows and runs were noted, with several apparently unoccupied burrow holes in the embankment to Enterprise Avenue on the northern end of the property. No burrowing owls were observed during surveys nor was there evidence of burrowing owl activity at the burrow sites. No mounds suitable for burrowing owl use were found elsewhere on the property.

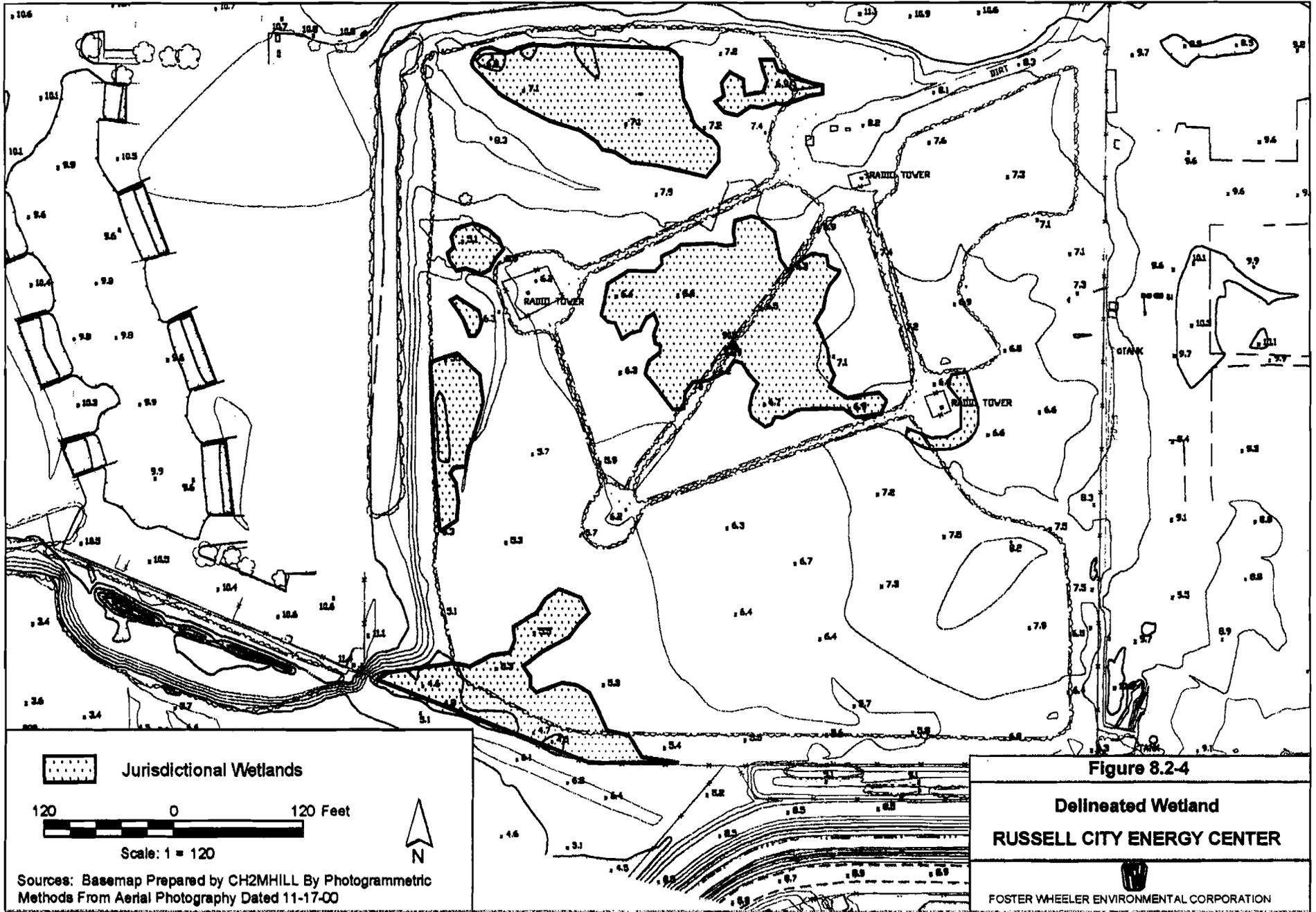
Wetlands

The project site is mapped as palustrine, emergent, temporarily flooded, diked/impounded wetland. The soils are mapped as Reyes Clay, drained. These are very deep, poorly drained soils on tidal flats. The water table has been lowered to a depth of about four feet. There are eight small ponded areas that meet the soils, hydrology, and vegetation criteria of jurisdictional wetlands (subject to Corps of Engineers regulation under the Clean Water Act). However, field surveys revealed that substantial portions of the property have been filled, or are Willows Clay, drained. These are very deep, poorly drained soils on basin rims. These upland areas did not meet the criteria to be classed as wetlands. Figure 8.2-4 shows a wetland delineation of the RCEC and AWT project site. Wetlands were found in eight separate areas that totaled 1.68 acres. The U.S. Army Corps of Engineers, San Francisco District, verified the wetland delineation conducted for the property in the field on April 24, 2001.

The stormwater retention pond near the project site to the south, while cut off from tidal influence, retains remnant elements of the transitional zone between the northern coastal salt marsh community and adjacent uplands. The area is characterized by small mud flats intermixed with upland areas dominated by ruderal species. Hydrologic inputs to the system include overflow from the Alameda Flood Control channel that runs south of the site, and runoff from the Project site.

Electric Transmission Line and Eastshore Substation Expansion

The electric transmission line corridor traverses urban areas and parking lots for most of the route and will not affect biological or wetland resources. The substation is located in a lot dominated by ruderal



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species. Ruderal vegetation includes non-native species that colonize disturbed areas, including disturbed margins around salt marsh habitats. Ruderal species include annual non-native species such as wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), Italian rye grass (*Lolium multiflorum*), and tarplant (*Hemizonia* sp.).

Natural Gas Pipeline

The natural gas transmission line corridor runs in Enterprise Avenue, crosses Clawiter Road, and then runs in a gravel-covered right-of-way through the Berkeley Farms facility. There are no biological or wetland resources located along this route.

Wastewater Return Pipeline

The proposed pipeline will be installed within Enterprise Avenue and will not affect biological or wetland resources. This area is dominated by horticultural trees and shrubs, and ruderal vegetation. Ruderal species include annual non-native species such as wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), and Italian rye grass (*Lolium multiflorum*).

Construction Laydown and Worker Parking Areas

Two of the proposed construction laydown areas are currently truck parking terminals with little or vegetation or wildlife habitat. As mentioned above, the open land surrounding the Eastshore substation dominated by ruderal species. Ruderal vegetation includes non-native species that colonize disturbed areas, including disturbed margins around salt marsh habitats. Ruderal species include annual non-native species such as wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), Italian rye grass (*Lolium multiflorum*), and tarplant (*Hemizonia* sp.).

8.2.1.11 AWT Plant Site Survey

The AWT plant will be situated adjacent to the RCEC plant site and consists of the same types of vegetation, wildlife, and wetlands habitats. Impacts to these biological resources are the same as those projected for the RCEC plant site.

8.2.2 Environmental Consequences

8.2.2.1 Significance Criteria

Potential direct and indirect project impacts to biological resources associated with construction, operation, and maintenance of the RCEC were evaluated. An impact would be considered significant if it resulted in the take of a listed species or its habitat; resulted in take of sensitive species or its habitat that jeopardized its viability, either locally or range-wide; or resulted in loss of species or populations necessary to maintain current distribution.

8.2.2.2 RCEC Plant Site

Construction of the RCEC footprint will result in the permanent loss of approximately 9.4 acres of disturbed ruderal vegetation and approximately 1.68 acres of jurisdictional wetlands (Table 8.2-5). No special status plant species were found at the RCEC plant site and none will be affected by construction of the plant. Construction of this project will likely result in the loss of individuals of several wildlife species occupying this site or dependent upon this site for specific physiological and ecological requirements. However, these species have no special protection status, are common to many areas, and are primarily limited to burrowing rodents (i.e., ground squirrel [*Spermophilus* sp.], pocket gophers [*Thomomys* sp.] and voles [*Microtus* sp.]). Due to the existing level of traffic on Enterprise Avenue, and

the low level of wildlife use in this highly urbanized area, construction traffic is not expected to result in increased wildlife road kills. Noise and activity from construction activities will have a negligible and temporary effect on wildlife use of this area.

Electric Transmission Line and Eastshore Substation Expansion

Upgrading of the electric transmission line is not expected to have a significant effect on biological or wetland resources. The project would involve constructing new transmission support towers and adding new conductors. The 1.1-mile route traverses existing areas within the Hayward Industrial Corridor.

Natural Gas Pipeline

Construction of the natural gas pipeline is not expected to result in any significant and long-term effects on biological resources. The pipeline route runs in Enterprise Avenue and under a graveled pipeline right-of-way on the Berkeley Farms property.

Wastewater Return Pipeline

Construction of the wastewater return line would not result in any significant and long-term effects on biological resources. This pipeline runs approximately 260 feet across Enterprise Avenue from the RCEC power plant site under existing paved streets.

Construction Laydown and Worker Parking Areas

Construction laydown and worker parking would not have significant effects on biological or wetland resources, since the trucking terminals on Depot and Enterprise are devoid of vegetation and the open land surrounding the Eastshore Substation consists of ruderal vegetation and does not contain wetlands or biological resources.

AWT Plant

The same impacts projected for the RCEC plant site also apply to the AWT plant. The backup water cooling supply pipeline runs in the WPCF's access pad, and would not affect biological resources. Other pipelines to and from the AWT (water supply, RO waste, microfiltration waste, and stormwater runoff), also run under paved areas.

8.2.2.3 Operation Phase Impacts

RCEC Plant Site

Once constructed and operational, the facility will have a minimal effect on wildlife resources in the area. Trees and shrubs planted for landscape screening around the RCEC, and the RCEC architectural treatment structures themselves, could provide perching or nesting sites for raptorial birds (hawks and falcons) and egg predators (crows and ravens). These could, in turn, use the facility as a base for predation against sensitive species living nearby (such as salt marsh harvest mouse, least tern, etc.). This potential effect could be easily controlled, however, by limiting trees planted to smaller species or species that do not provide strong support for large nests, and by installing devices on possible perching places at the power plant (for example, on the architectural screen) that would discourage raptorial birds from perching.

Operation of the RCEC would produce some noise, as described in Section 8.7 (Noise). Due to the close proximity of existing industrial plants, city streets, and railroad tracks, the noise generated during operation of the RCEC facility is not expected to boost noise levels to a degree that would significantly affect wildlife in the vicinity of the plant. Current noise levels at the site are well above those of more

isolated examples of natural salt marsh, yet species appear to have habituated to it. Elimination of some current facilities causing noise (i.e., the sand-blasting operation) may compensate somewhat for increased noise from the facility itself.

Human activity at the facility should have no significant affect on the adjacent salt marsh habitats as long as screening is provided. Lighting would be designed to reduce glare (Section 8.13, Visual Resources).

Electric Transmission Line and Eastshore Substation Expansion

Potential effects of additional electric transmission conductors on bird species utilizing this area could include collision and electrocution. These effects would likely continue throughout the life of the facility. There is no evidence, however, that this is currently a significant problem or that additional conductors on an existing transmission line would increase mortality to a level of significance. Bird collisions with electric conducting wires occur when the birds are unable to see the lines, especially during fog and rain events, and if flushed suddenly from the ground. Factors that affect the risk of collision include weather conditions, behavior of the species of bird, and location of the line. The transmission line that will be upgraded is currently almost entirely located in an urban, developed area.

Natural Gas Pipeline

Operation of the gas pipeline would not result in impacts to special status plants, animals, or wetlands unless a leak occurred. A rupture or leakage of the pipeline could result in reduced air quality and, in severe cases, a fire, but any potential effects on native vegetation or wildlife, would be temporary.

Wastewater Return Pipeline

Operation and maintenance of the wastewater return line would not affect biological resources. This pipeline runs approximately 260 feet across Enterprise Avenue from the RCEC under existing paved streets.

Construction Laydown and Worker Parking Areas

Construction laydown and worker parking areas would return to their pre-construction uses after construction is completed. Hence, there would be no operation impacts.

AWT Plant

Once constructed and operational, the facility will have a minimal effect on biological resources in the area.

8.2.2.4 Potential Stack Emission Effects on Soil and Vegetation

Emissions from the HRSG stacks and cooling tower drift will not significantly affect vegetation and soils surrounding the RCEC project area. The following paragraphs present the results of an analysis of the HRSG stack and cooling tower emissions for the RCEC project. The AWT plant will not produce any emissions of concern.

The purpose of this analysis is to evaluate the potential detrimental effects that the projected HRSG stack and cooling tower emissions from the RCEC plant site will have on surrounding vegetation. Potential pollutant stack emissions included in this analysis include carbon monoxide (CO), inhalable particulates (PM₁₀), and oxides of nitrogen and sulfur (NO_x and SO₂). No pollutant emissions are predicted to result in concentrations exceeding the U.S. Environmental Protection Agency (USEPA) prevention of significant deterioration (PSD) significant impact levels, for either short-term or annual averaging

periods for CO, PM₁₀, NO_x, and SO₂. Table 8.2-6 presents the total maximum impact concentrations for the RCEC project, as discussed in Section 8.1 (Air Quality).

Table 8.2-6. RCEC operational effects from HRSG stack and cooling tower emissions.

| Pollutant | Averaging Period | Maximum Project Concentration ¹ (µg/m ³) | State Ambient Air Quality Standards (µg/m) |
|------------------|------------------|---|--|
| CO | 1-hour | 7671 | 23,000 |
| | 8-hour | 3847 | 10,000 |
| NO _x | 1-hour | 376 | 470 |
| | Annual | 42 | 100 |
| SO ₂ | 1-hour | 125 | 650 |
| | 3-hour | 56 | 1,300 |
| | 24-hour | 19 | 109 |
| | Annual | 5.3 | 80 |
| PM ₁₀ | 24-hour | 92 | 50 |
| | Annual | 24.5 | 30 |

¹Maximum project concentrations include representative background concentrations
µg/m³ = micrograms per cubic meter

Carbon Monoxide

Plants metabolize and produce carbon monoxide (CO). Few studies on thresholds for detrimental effects on vegetation have been conducted. Most available studies use very high CO concentrations (above 100 parts per million [ppm]). Soil microorganisms probably acts 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 µg/m³ (USEPA 1979).

Zimmerman et al. (1989) exposed a variety of plant species to CO at concentrations of 115,000 µg/m³ to 11,500,000 µg/m³ from 4 to 23 days. 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 µg/m³ for several days (USEPA 1979).

Comparatively low levels of CO in the soil have been shown to inhibit nitrogen fixation. Concentrations of 113,000 µg/m³ have been shown to reduce nitrogen fixation, while 572,000 to 1,142,000 µg/m³ result in nearly complete inhibition (USEPA 1979).

Maximum predicted 1-hour and 8-hour CO emissions have been calculated from the RCEC HRSG exhaust stack. The maximum 1-hour CO concentration is 1231 µg/m³. Adding this impact to the maximum 1-hour CO background concentration of 6440 µg/m³, measured at the nearest monitoring station results in a total predicted 1-hour CO concentration of 7671µg/m³. This figure is significantly less than the CO concentration of 115,000 µg/m³ determined to result in minimal growth retardation in plants, as well as the 113,000 µg/m³ concentration found to result in slight reduction of nitrogen fixation. Therefore, predicted CO emission levels from the RCEC are not expected to result in adverse effects on vegetation.

Sulfur Dioxide and Nitrogen Oxides

SO₂ and NO_x are the major airborne pollutants of concern for the RCEC project. The extent of their effect on soils and vegetation would be directly related to a variety of factors, including wind speed, direction and frequency, air temperature, humidity, the geomorphology of the area, and the location of the proposed project in relation to sensitive plant communities in the zone of impact.

Sulfur dioxide tends to convert to sulfite and sulfate during chemical transformation in soils. Interpretation of the results of investigations published to date has engendered considerable controversy due to the complexity of terrestrial ecosystems. However, the effects of acidified precipitation containing sulfate (SO₄) on terrestrial ecosystems have been investigated with respect to alteration of soil chemistry as it relates to vegetation health. High levels of SO₄ may reduce soil pH, thereby decreasing the availability of certain essential nutrients and increasing the concentrations of soluble aluminum, which reduces plant growth.

In soils where nitrate-nitrogen is not limiting plant growth, excess nitrate may percolate through the soil column, carrying base cations and exerting an acidifying effect. Increased atmospheric contributions of nitrate may influence vegetation in a species-specific way, with some species taking advantage of its fertilizing characteristics while others (such as those occurring in nitrogen-limited soils) are adversely affected.

Sulfur is a major plant nutrient and can be directly absorbed into the soil. Therefore, an increase in SO₂ in the soil (particularly at levels below threshold limits) would not have an adverse effect on vegetation.

SO₂ can affect vegetation directly (as a gas) or indirectly by means of its principal reaction product, SO₄ (e.g., acidification of soils). In addition, a third mechanism of impact is the formation of acid mist. Direct effects of injury can be manifested as foliar necrosis, decreased rates of growth or yield, predisposition to disease, and reduced reproductive capacity.

Environmental factors, such as temperature, light, humidity, and wind speed, influence both the rate of gas absorption and the plant physiological response to absorbed quantities. The higher the humidity, the higher the absorption of gases. Exposure duration and frequency are also important factors that determine the extent of injuries.

Guidelines for air emission impact assessment provided in the technical literature are diverse and threshold dosages required to cause injury are extremely variable. This is due to the variety of factors affecting plant responses to phytotoxic gases. Consequently, in cases where emissions are below lower threshold limits, decreased yields can result in the absence of visible injury (Sprugel et al. 1980) and long-term impacts should be addressed.

Among the different published attempts to define SO₂ thresholds for vegetation effects, two represent worst-case situations. Loucks et al. (1980) presented threshold ranges between 131 µg/m³ and 262 µg/m³ SO₂, and McLaughlin (1981) suggested values of 1310 µg/m³ SO₂ for the 1-hour average and 786 µg/m³ for the 3-hour average.

According to the dose-injury curve for SO₂-sensitive plant species provided by the USFWS (1978), the lowest 3-hour concentration expected to cause injury to plants is approximately 390 µg/m³, which is significantly higher than the projected emissions from the RCEC. However, these predicted values are applicable only when plants are growing under the most sensitive environmental conditions and stage of maturity. Thresholds for chronic plant injury by SO₂ have been estimated at about 130 µg/m³ on an

annual average (USFWS 1978). The maximum annual average concentration modeled for this project ($0.02 \mu\text{g}/\text{m}^3$) is far below the USFWS threshold for chronic exposure, and the worst-case projected 3-hour maximum of about $3.67 \mu\text{g}/\text{m}^3$ is substantially below the McLaughlin protection level of $786 \mu\text{g}/\text{m}^3$. Consequently, the projected concentration of SO_2 is not expected to cause visible foliar injury or significant adverse chronic effects.

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 $490 \mu\text{g}/\text{m}^3$ can cause decreases in dry weight and leaf area, but 1-hour exposures of at least $18,000 \mu\text{g}/\text{m}^3$ are required to cause leaf damage. The modeled maximum RCEC emissions of NO_2 impacts of $0.36 \mu\text{g}/\text{m}^3$ are far below these threshold limits ($219.0 \mu\text{g}/\text{m}^3$ or 0.1169 ppm). In addition, the total predicted maximum 1-hour NO_2 concentrations of $169 \mu\text{g}/\text{m}^3$ would be significantly less than the 1-hour threshold ($7,500 \mu\text{g}/\text{m}^3$ or 3,989 ppm) for 5 percent foliar injury to sensitive vegetation (USEPA 1991). This indicates that NO_x emissions from the RCEC, when considered in the absence of other air pollutants, would not adversely affect vegetation.

Airborne Particulates

Particulate emissions will be controlled by inlet air filtration and use of natural gas. 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. Information on physical effects is scarce, presumably in part because such effects are slight or not obvious except under extreme situations (Lodge et al. 1981). Studies performed by Lerman and Darley (1975) found that particulate deposition rates of $365 \text{ g}/\text{m}^2/\text{year}$ caused damage to fir trees, but rates of $274 \text{ g}/\text{m}^2/\text{year}$ and $400\text{--}600 \text{ g}/\text{m}^2/\text{year}$ did not damage vegetation at other sites.

The maximum annual predicted concentration for PM_{10} from the RCEC is $0.22 \mu\text{g}/\text{m}^3$. 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 $0.14 \text{ g}/\text{m}^2/\text{year}$, which is several orders of magnitude below that which is expected to result in injury to vegetation (i.e., $365 \text{ g}/\text{m}^2/\text{year}$). The addition of the maximum predicted annual particulate deposition rate for the RCEC to the maximum background concentration of $24.3 \mu\text{g}/\text{m}^3$, measured at the nearest monitoring station yields a total estimated particulate deposition rate of $15.5 \text{ g}/\text{m}^2/\text{year}$, utilizing the 2 cm/sec factor. This total is still approximately one order of magnitude less than levels expected to result in plant injury.

The primary chemical mechanism for airborne particulates to cause injury to vegetation is by trace element toxicity. Many factors may influence the effects of trace elements on vegetation, including temperature, precipitation, soil type, and plant species (USFWS 1978). Trace elements adsorbed to particulates emitted from power plant emissions reach the soil through direct deposition, the washing of plant surfaces by rainfall, and the decomposition of leaf litter. Ultimately, the potential toxicity of trace elements that reach the root zone through leaching will be dependent on whether the element is in a form readily available to plants. This availability is controlled in part by the soil cation exchange capacity, which is determined by soil texture, organic matter content, and kind of clay present. Soil pH is also an important influence on cation exchange capacity; in acidic soils, the more mobile, lower valence forms of trace metals usually predominate over less mobile, higher valence forms. The silty clay and clay soils located in the RCEC project area will have a lower potential for trace element toxicity due to the comparatively high soil pH commonly found in bay soils.

Perhaps the most important consideration in determining toxicity of trace elements to plants relates to existing concentrations in the soil. Several studies have been conducted relating endogenous trace element concentrations to the effects on biota of emissions from model power plants (Dvorak et al. 1977, Dvorak and Pentecost et al. 1977, Vaughan et al. 1975). These studies revealed that the predicted levels of particulate deposition for the area surrounding the model plant resulted in additions of trace elements to the soil over the operating life of the plant which were, in most cases, less than 10 percent of the total existing levels. Therefore, uptake by vegetation could not increase dramatically unless the forms of deposited trace elements were considerably more available than normal elements present in the soil.

Cooling Tower Discharges

Contaminants within the RCEC cooling tower drift are expected to consist almost entirely of the minerals that are not removed by the AWT process. Metals and other chemicals of concern will be neutralized and removed from the cooling tower makeup water before it is introduced into the plant cooling water system.

PM₁₀ emissions from the HRSG stacks and cooling towers were calculated for the RCEC. The maximum annual deposition rate for the RCEC of 0.14 g/m²/year is several magnitudes below that which is expected to result in mechanical injury to vegetation (i.e., 365 g/m²/year; see previous discussion on airborne particulates; Lerman and Darley 1975).

Various salts from cooling water and the pH neutralizing process (Table 8.15-3) are expected to be in the cooling tower water. These low levels of salts are not expected to result in injury to the surrounding environment. Pahwa and Shipley (1979) exposed vegetation (corn, tobacco, and soybeans) to varying salt deposition rates to simulate drift from cooling towers that use saltwater (20-25 parts per thousand) circulation. Salt stress symptoms on the most sensitive crop plants (soybeans) were barely perceptible at a deposition rate of 2.98 g/m²/year (Pawha and Shipley 1979). Using an assumption that 100 percent of the airborne particulates from the RCEC emissions produce salts in the cooling tower drift, the calculated deposition rate of 0.14 g/m²/year (which includes HRSG stack emissions) is more than one order of magnitude below the deposition rate that was shown to cause barely perceptible vegetation stress from salt mist. This highly conservative estimate of deposition and the fact that the RCEC cooling tower will use fresh water makes this evaluation much overstated. Therefore, cooling tower drift is not expected to have any impact on vegetation in surrounding habitats within the maximum impact radius for the RCEC cooling tower drift.

8.2.2.5 Wastewater Discharges

When the plant is operating at full capacity, approximately 3.33 million gallons of secondary effluent wastewater per day will be pumped through the cooling water supply pipeline from the City of Hayward Water Pollution Control Facility and treated to tertiary quality in the AWT. Almost half of the water eventually ends up in the cooling tower effluent. Effluent from the cooling tower blowdown will be returned to the Water Pollution Control Facility via the wastewater return pipeline. During normal operating conditions, the RCEC will discharge 53 gallons per minute (0.076 million gallons per day) and at peak conditions, approximately 66 gallons per minute (0.095 million gallons per day) will be discharged to the wastewater return pipeline. The City of Hayward discharges this effluent through the East Bay Dischargers Authority (EBDA) pipeline to the EBDA outfall in San Francisco Bay near the Oakland Airport. The RCEC project thus provides a net benefit to water quality in San Francisco Bay by

reducing the amount of freshwater effluent discharged to the Bay, without increasing the pollutant loading of the water discharged.

8.2.3 Cumulative Impacts

The RCEC project would not result in significant cumulative effects on special status plants, natural plant communities, wetlands, or wildlife. Though the project would result in a permanent loss of 1.68 acres of seasonal wetlands, this loss would be mitigated by replacement or enhancement of equal or larger quantity of better quality wetlands in the general project area, a net benefit to the environment. There would be no permanent loss of special status plants or sensitive wildlife habitats. As a result, the project is not expected to result in any significant cumulative impacts to biological resources.

8.2.4 Proposed Mitigation Measures

The following mitigation measures would ensure that any potentially significant project environmental impacts to biological resources would be mitigated below the threshold of significance.

- The project will require an individual permit from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act, to fill the 1.68-acres of seasonal wetlands on site. The permit application will include a mitigation plan that identifies how the seasonal wetlands will be replaced in kind, either through a mitigation bank, by purchase of wetland property and dedication of a conservation easement for that property, or by support of wetland and wildlife habitat restoration efforts in the project area. The mitigation plan will be developed in consultation with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and San Francisco Bay Regional Water Resources Control Board.
- Wetlands adjacent to the construction site (the parcels south of the RCEC site) will be avoided. A Stormwater Pollution Prevention Plan (SWPPP) will be developed to ensure sediment from the project site does harm not any adjacent wetland areas. Mitigation measures in the SWPPP will include the implementation of silt fence and other sediment control measures, and temporary fencing to ensure entry into sensitive salt marsh communities is avoided. This will be especially important on the southern boundary of the project construction area. Temporary fencing will be implemented to ensure entry into sensitive salt marsh areas south of the project site or other wildlife habitats is avoided.
- Monitoring of construction activities will be carried out by personnel trained to detect any potential and unforeseen impacts on listed, sensitive, or migratory wildlife and their habitats adjacent to the project site. If actual or potential effects are detected, the construction foreman will cease the activities that are potentially affecting these species and will consult with a professional biologist qualified to assess the situation and make recommendations to alter or alleviate any activities that are resulting in these effects.

Project biologists will conduct additional field surveys in June for the Hispid's birds beak, Point Reyes bird's beak, and Delta tule pea. In the event that these plants are identified on site during their blooming phases, additional consultation with regulatory agencies and mitigation planning will be undertaken to ensure that any potential impact to these species is mitigated to a level below significance.

8.2.5 Applicable Laws, Ordinances, Regulations, and Standards

Table 8.2-7 describes the applicable laws, ordinances, regulations, and standards (LORS) pertaining to biological resources for the RCEC project.

Table 8.2-7. Laws, ordinances, regulations, and standards.

| LORS | Purpose | Regulating Agency | Permit or Approval | Schedule and Status of Permit | Conformance (Section) |
|---|---|--------------------------|---|--|--|
| Federal | | | | | |
| Endangered Species Act of 1973 and implementing regulations, Title 16 United States Code (USC) §1531 et seq. (16 USC 1531 et seq.), Title 50 Code of Federal Regulations (CFR) §17.1 et seq. (50 CFR 17.1 et seq.). | Designates and protects federally threatened and endangered plants and animals and their critical habitat. | USFWS and NMFS | Issues letter of concurrence after review of mitigation measures. Issues Biological Opinion (BO) with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. Section 7 consultation may not be required. | Figure 8.2-1a & b 8.2.1.2 8.2.1.4 Table 8.2-1 8.2.2.2 8.2.5.2 |
| Section 7 of Fish and Wildlife Coordinating Act, 16 USC 742 et seq., 16 USC 1531 et seq., and 50 CFR 17. | Requires consultation if any project facilities could jeopardize the continued existence of an endangered species. Applicability depends on federal jurisdiction over some aspect of the project. | USFWS | Issues BO with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | 8.2.1.4 8.2.5.2 |
| Section 10(1)(A) of the ESA | Requires a permit to "take" threatened or endangered species during lawful project activities. If no federal nexus for project, a Habitat Conservation Plan (HCP) may be necessary. | USFWS | USFWS issues a Section 10(1)(A) Federal Fish and Wildlife Permit and/or HCP approval. | N/A | 8.2.2.1 8.2.5.2 |
| Section 404 of Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR §§320 and 323). | Gives the USACE authority to regulate discharges of dredge or fill material into waters of the United States, including wetlands. | USACE | Individual permit to fill wetlands adjacent to tidal waters on the RCEC project site. | PCNs to be developed describing the project and wetland mitigation measures, permits to be obtained before construction in wetlands. | 8.2.2.1 8.2.2.2 8.2.3.1 8.2.5.2 |

Table 8.2-7. (continued)

| LORS | Purpose | Regulating Agency | Permit or Approval | Schedule and Status of Permit | Conformance (Section) |
|---|---|--------------------------|--|--|--|
| Section 401 of Clean Water Act of 1977. | Requires the applicant to conduct water quality impact analysis for the project when using 404 permits and for discharges to waterways. | CRWQCB | Water Quality Certification | Water quality analysis currently being conducted, Certification to be obtained before construction begins in 2002. | 8.2.3.1 8.2.5.2 |
| Migratory Bird Treaty Act 16 USC §§703-711. | Prohibits the non-permitted take of migratory birds. | USFWS and CDFG | Issues BO with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | 8.2.1.2 8.2.2.2 8.2.2.3 8.2.2.4 8.2.3.3 8.2.5.2 |
| State | | | | | |
| California Endangered Species Act of 1984, Fish and Game Code, §2050 through §2098. | Protects California's endangered and threatened species. | CDFG | Issues letter of concurrence after review of mitigation measures. Issues BO with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | Figure 8.2-1a & b 8.2.1.2 8.2.1.4 8.2.2.2 8.2.5.2 |
| Title 14, California Code of Regulations (CCR) §§670.2 and 670.5. | Lists plants and animals of California declared to be threatened or endangered. | CDFG | Issues BO with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | 8.2.1.4 Table 8.2-1 |

Table 8.2-7. (continued)

| LORS | Purpose | Regulating Agency | Permit or Approval | Schedule and Status of Permit | Conformance (Section) |
|--|--|--------------------------|---|--|---|
| Fish and Game Code Fully Protected Species. §3511: Fully Protected birds §4700: Fully Protected mammals §5050: Fully Protected reptiles and amphibians §5515: Fully Protected fishes | Prohibits the taking of listed plants and animals that are Fully Protected in California. | CDFG | Issues BO with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | Figure 8.2-1a & b 8.2.1.2 8.2.1.4 8.2.2.2 8.2.5.2 |
| Fish and Game Code §1930, Significant Natural Areas. | Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitats. Listed in the CNDDB. | CDFG | Issues BO with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | 8.2.1 Figure 8.2-1a & b 8.2.1.1 8.2.1.2 8.2.1.4 Figure 8.2-4 8.2.2.2 8.2.2.3 |
| Fish and Game Code §1580, Designated Ecological Reserves. | The CDFG commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study. | CDFG | Issues BO with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | Figure 8.2-1a & b 8.2.2.3 |

Table 8.2-7. (continued)

| LORS | Purpose | Regulating Agency | Permit or Approval | Schedule and Status of Permit | Conformance (Section) |
|--|---|--|--|--|--|
| Fish and Game Code §1600, Streambed Alteration Agreement. | Reviews projects for impacts on waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances. | CDFG | Issues conditions of the Streambed Alteration Agreement that reduces and minimizes effects on vegetation and wildlife. | Streambed Alteration Agreement needed only if project impacts banks of waterways during construction. | 8.2.2.3 |
| Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq. | Designates state rare and endangered plants and provides specific protection measures for identified populations. | CDFG | Reviews mitigation options if there will be significant project effects on threatened or endangered plant species. | Mitigation measures being prepared for review by agencies. Letter of concurrence to be obtained before construction. | Figure 8.2-1a & b 8.2.1.4 8.2.2.3 8.2.3.2 |
| CDFG Policies and Guidelines, Wetlands Resources Policy. | Provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools. | CDFG California Environmental Protection Agency (Cal/EPA) CRWQCB | Reviews 404 permit application and wetland mitigation measures for compliance. | PCNs to be developed that include wetland mitigation measures. 404 permit to be obtained before start of construction. | 8.2.2.2 8.2.5.2 |
| Public Resource Code §§25500 & 25527. | Siting of facilities in certain areas of critical concern for biological resources, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value, is prohibited, or when no alternative, strict criteria is applied. | USFWS CDFG | Issues BO with Conditions after review of BA. | Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | 8.2.1.2 8.2.2.3 8.2.3.2 |

Table 8.2-7. (continued)

| LORS | Purpose | Regulating Agency | Permit or Approval | Schedule and Status of Permit | Conformance (Section) |
|------------------------------------|---|--------------------------|---|--|--|
| Title 20 CCR §§1702 (q) and (v). | Protects "areas of critical concern" and "species of special concern" identified by local, state, or federal resource agencies within the project area, including the CNPS. | USFWS CDFG | Issues BO with Conditions after review of BA. | Consultant to applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | Figure 8.2-1a & b 8.2.1.2 8.2.1.4 Table 8.2-1 8.2.3.1 8.2.5 |
| Title 14 CCR Section 15000 et seq. | Describes the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site. | USFWS CDFG | Issues BO with Conditions after review of BA. | Consultant to applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. | 8.2.2.1 8.2.2.3 8.2.5 |

8.2.6 Involved Agencies and Agency Contacts

There are a number of agencies that are involved with biological resources and special status species. The agencies and persons to contact for each of these agencies are shown in Table 8.2-8.

Table 8.2-8. Agency contacts.

| Agency | Contact | Title | Telephone |
|---|----------------------------|--|----------------------------------|
| U.S. Fish and Wildlife Service Federal Building 2800 Cottage Way, Room W-2605 Sacramento, California 95825 | Dan Buford | Branch Chief, Bay and Delta Branch | (916) 414-6600 |
| California Department of Fish and Game 7329 Silverado Trail Napa, CA 94558 Mail: P.O. Box 47, Yountville, CA 94599 | Carl Wilcox | Wildlife Biologist | (707) 944-5500 |
| U.S. Army Corps of Engineers 333 Market Street San Francisco, CA 94105 | Ed Wylie Mark D'Ávignon | South Section Chief Wetland Specialist | (415) 977-8464 (415) 977-8446 |
| San Francisco Bay Regional Water Quality Control Board 1515 Clay Street, Suite 1400 Oakland, CA 94612 | Keith Lichen Dale Bower | Contacts for surface water non-point sources, Alameda County | (510) 622-2300 |

8.2.7 Permits Required and Schedule

Applicable biological resources permits required for the project are listed below and in Table 8.2-9.

Table 8.2-9. Permits required and permit schedule.

| Permit/Approval Required | Agency | Schedule |
|---|--|--|
| Clean Water Act, Section 404, Individual Project Permit to fill jurisdictional wetlands | U.S. Army Corps of Engineers, San Francisco District | Application concurrent with AFC filing, data adequacy, and approximately four-month review |
| Clean Water Act, Section 401, Water Quality Certification (for filling jurisdictional wetlands) | Regional Water Quality Control Board | Application concurrent with AFC filing, data adequacy, and approximately four-month review |

Information requirements for these permits include:

- Complete characterization of the wetlands on wetland delineation forms (Appendix 8.2-D)
- Site maps showing the wetland delineation and location of the wetlands to be filled
- A description of the project that will fill the wetlands
- Construction methods that will be used and their potential effects on water quality in adjacent water bodies
- A complete mitigation plan, including an assessment of the quality of the wetlands fill and a plan to replace the filled wetlands at an acreage ratio of 1:1 or better with wetlands of equivalent or better quality, as near as possible to the location of the filled wetlands.

8.2.8 References

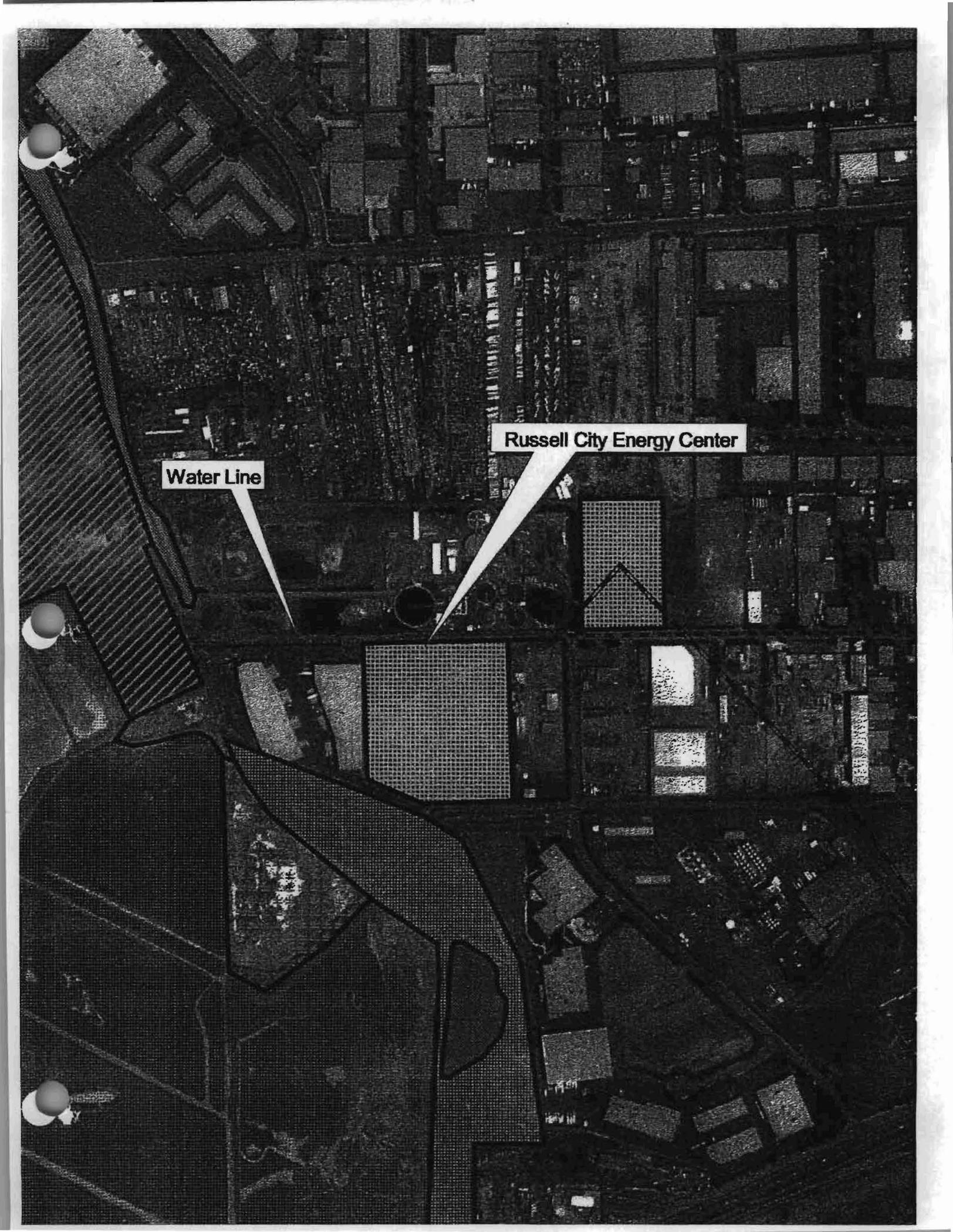
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An aerial photograph of an industrial area, likely a power plant or refinery. The image is in black and white and shows various structures, including large rectangular buildings with grid-like patterns, possibly cooling towers or heat exchangers. A prominent feature is a large, dark, circular structure in the center. The area is surrounded by a network of roads and utility lines. Two white callout boxes with black text and white leader lines point to specific features: 'Water Line' on the left and 'Russell City Energy Center' in the center-right. The overall scene is a complex of industrial infrastructure.

Water Line

Russell City Energy Center

8.6 LAND USE

This section provides a discussion of land use at and within the vicinity of the proposed Russell City Energy Center (RCEC) and Advanced Wastewater Treatment (AWT) plant site and its linear facilities, and assesses the potential effects of the RCEC construction and operation on land use. Section 8.6.1 discusses the regional and local land use setting, focusing on land use within one mile of the project site and 0.25 mile of the project's linear facilities. It also discusses applicable land use plans/controls that apply to the project, and presents a brief summary of future land use projections for the region. Section 8.6.2 discusses potential environmental effects as they relate to land use compatibility and development. Section 8.6.3 discusses cumulative impacts and Section 8.6.4 presents proposed mitigation measures for any impacts determined to be significant. Section 8.6.5 presents applicable laws, ordinances, regulations, and standards related to land use, and Section 8.6.6 references agency contacts. Section 8.6.7 presents permit requirements and schedules, and Section 8.6.8 contains a list of references cited.

8.6.1 Affected Environment

8.6.1.1 Regional Setting

The project is located in the City of Hayward in Alameda County, which is situated in the East Bay Subregion of the San Francisco Bay Area in California. Alameda County encompasses approximately 472,000 acres (California Department of Finance [CDOF] 1999a). Incorporated cities in Alameda County include Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Oakland, Piedmont, Pleasanton, San Leandro, Union City, and Newark.

Regional land use is diverse, with portions of Alameda County including major urban centers. For example, the City of Oakland has a population of approximately 399,900 California Department of Finance 2001 (CDOF). San Leandro has a population of 76,700, Fremont has a population of 203,600, and the unincorporated areas of Alameda County have a population of 134,800. Hayward had a population of 129,600 in 2000, which is increasing slightly every year (CDOF 1999b).

In 1995, approximately 26 percent of Alameda County's land area was developed urban land (e.g., residential, commercial, and industrial), compared to 14.7 percent for the Bay Area as a whole (Association of Bay Area Governments [ABAG] 1997). Other land uses draw upon the area's close proximity to the San Francisco Bay, including coastal ports and harbors (e.g., Port of Oakland), military uses, and salt production. The strong military presence in the East Bay region has been reduced through implementation of the Base Realignment and Closure program on most of the military installations in the Bay Area, including the Mare Island Naval Shipyard; Oakland Army Base; Naval Air Station, Alameda; Oak Knoll Naval Hospital, Oakland; and the Naval Fleet Industrial Supply Center, Oakland. In the southern reaches of the county, a large salt production industry has developed. Large, flat coastal areas are diked to allow seawater to enter and eventually evaporate, leaving salt. Approximately 18 percent of the greater Bay Area is devoted to agricultural production (ABAG 1997). In 1997, the total value of agricultural production in Alameda County was \$47.4 million, ranking 44th in the State (California Department of Food and Agriculture 1999). The top five crops, by value, were (wine) grapes (\$10.39 million), (cut) flowers (\$9.32 million), trees and shrubs (\$8.29 million), bedding plants (\$6.46 million), and cattle/calves (\$5.66 million).

A significant portion of other undeveloped land in the region is designated protected open space; this is particularly true in the East Bay. The U.S. Fish and Wildlife Service (USFWS) administers the 21,500-acre Don Edwards San Francisco Bay National Wildlife Refuge, located along the edge of the Bay to the

south of Hayward. The Hayward Area Recreation District (HARD) manages the 1,800-acre Hayward Regional Shoreline wetland open space area, located one-mile northwest of the project site. Numerous community parks also contribute to the open space landscape.

8.6.1.2 Local Setting

RCEC Plant Site

The power plant site is located in the City of Hayward Industrial Corridor, directly across Enterprise Avenue from the City's Water Pollution Control Facility (WPCF) (wastewater treatment plant), among heavy and light industrial and office uses. The RCEC is consistent with existing uses of neighboring properties, such as the Water Pollution Control Facility (WPCF), the Rohm and Haas paint polymers plant (located approximately 2,000 feet southeast), and a multi-company trucking warehouse facility (located immediately west). Figure 8.6-1 shows existing land uses within one mile of the project site. The Hayward Industrial Corridor extends to the north for about 1.5 miles to the Hayward Air terminal, and to the east for about the same distance. Large industrial facilities to the east include the Gillig bus manufacturing plant and Berkeley Farms dairy processing facility. A variety of smaller warehousing and industrial businesses line Enterprise Avenue, Whitesell Street, and Depot Road, the nearest streets. A pocket of unincorporated County land that contains a number of automobile salvage yards lies between Depot Road and the WPCF.

The nearest residential uses to the project consist of an apartment complex located northeast and approximately 0.82 miles from the project site, and a single-family dwelling located on Depot Road east of Clawiter Road, also about 0.82 miles away. There are several residences remaining within the Hayward and County Industrial zones on McCone Avenue and Dunn Road. These are approximately 0.8 miles or more from the project site. The amount of housing within a one-mile radius of the project is very small and, other than the McCone Avenue and Dunn Road residences, is confined to the Mt. Eden residential area east of Industrial Boulevard.

Open land lies to the south and west of the project site, between the project site and State Route 92. This area includes a stormwater retention pond that is owned by the City of Hayward. This pond is used to regulate stormwater flow into marshlands further south, including the HARD marsh and a salt marsh harvest mouse preserve that is located further south, along State Route 92. The HARD marsh is a reclamation project that involves the restoration of former salt evaporation ponds to brackish marsh using secondary treated wastewater from the Union Sanitary District (USD) Alvarado Treatment Plant. Other land uses to the south and west include recreational uses at the Hayward Shoreline Regional Park (managed by East Bay Regional Parks District) and the Shoreline Interpretive Center that is run by the HARD. The Shoreline Interpretive Center is located about 0.73 miles from the plant at the end of Breakwater Drive, adjacent to State Route 92. From that location, hiking trails extend further west to the bay and north along the bay shore.

Major surface roads within the vicinity of the proposed project include State Route 92, Clawiter Road, Enterprise Avenue, Industrial Avenue, and Depot Road. Union Pacific Railroad industrial spur tracks abuts the southern boundary of the project. Refer to Section 8.12 for further details regarding transportation facilities.

Nearby schools are located in the Mount Eden and Glen Eden areas at distances of approximately 1 mile or more from the RCEC site. More specifically, Chabot Community College is just over one mile east-northeast of the site. The Life Chiropractic West College is located east-northeast of the project site at the

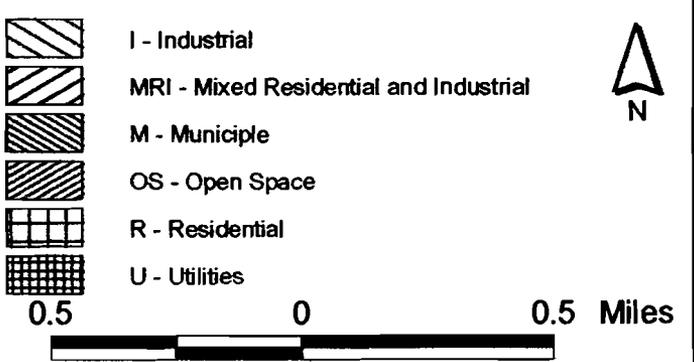
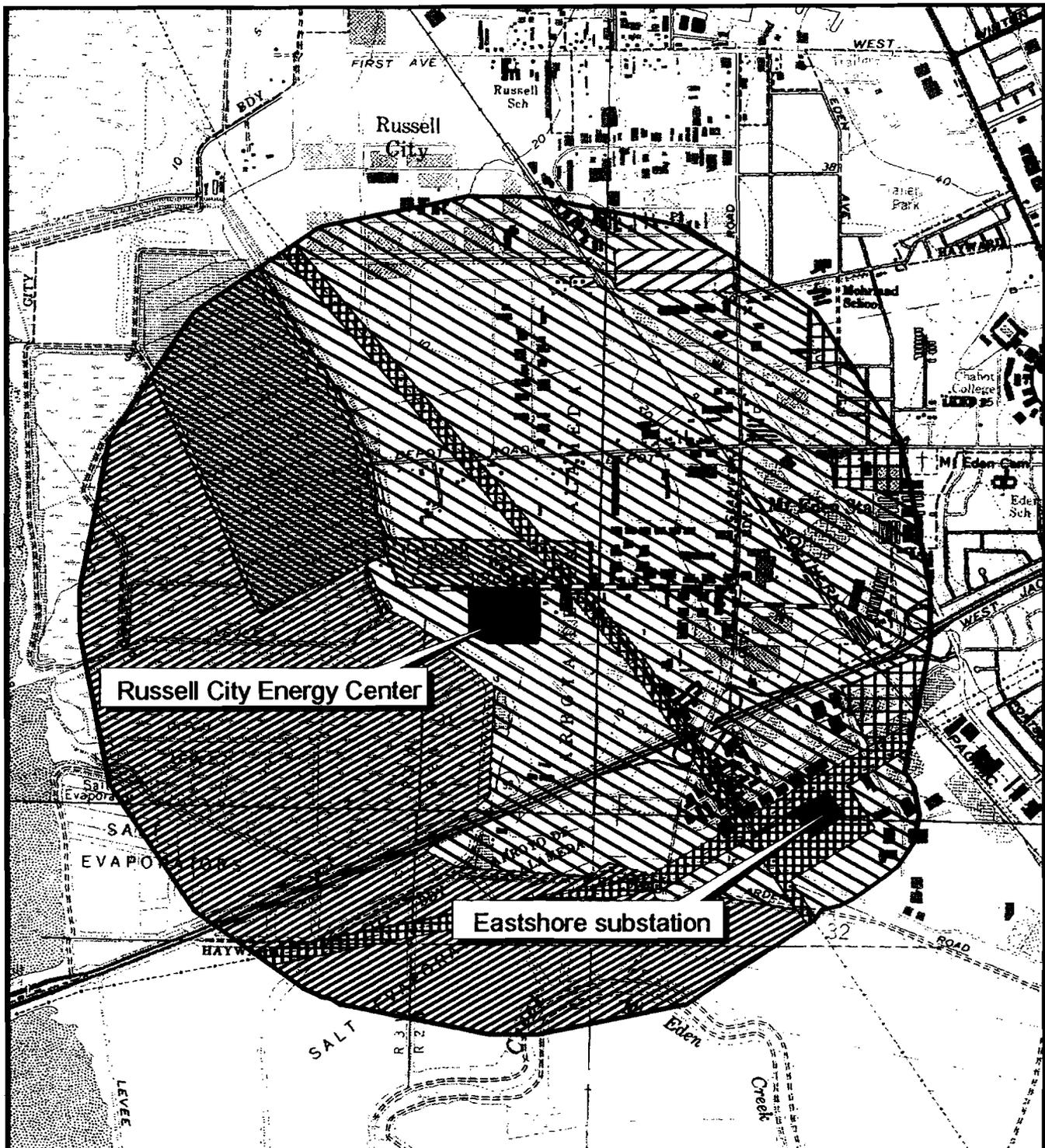
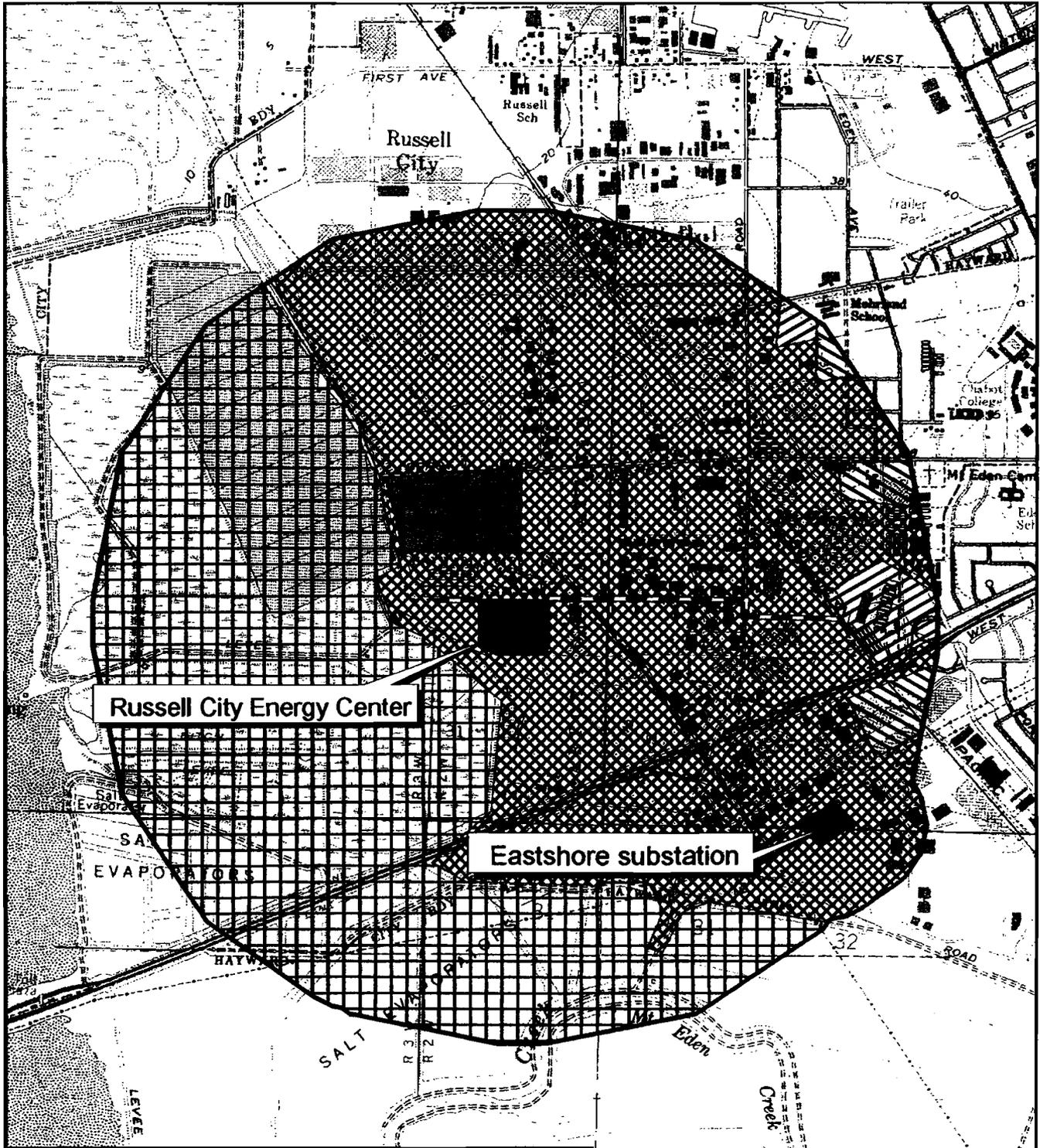


Figure 8.6-1
Land Use
RUSSELL CITY ENERGY CENTER

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Russell City Energy Center AFC

May 2001



Russell City Energy Center

Eastshore substation

Legend

- | | | | |
|---|------------------------------------|---|-------------|
|  | Industrial |  | Residential |
|  | Heavy industrial (county - M-2) |  | Floodplain |
|  | Planned development | | |



0.5 0 0.5 Miles

Scale = 1:24,000

Figure 8.6-2

Zoning

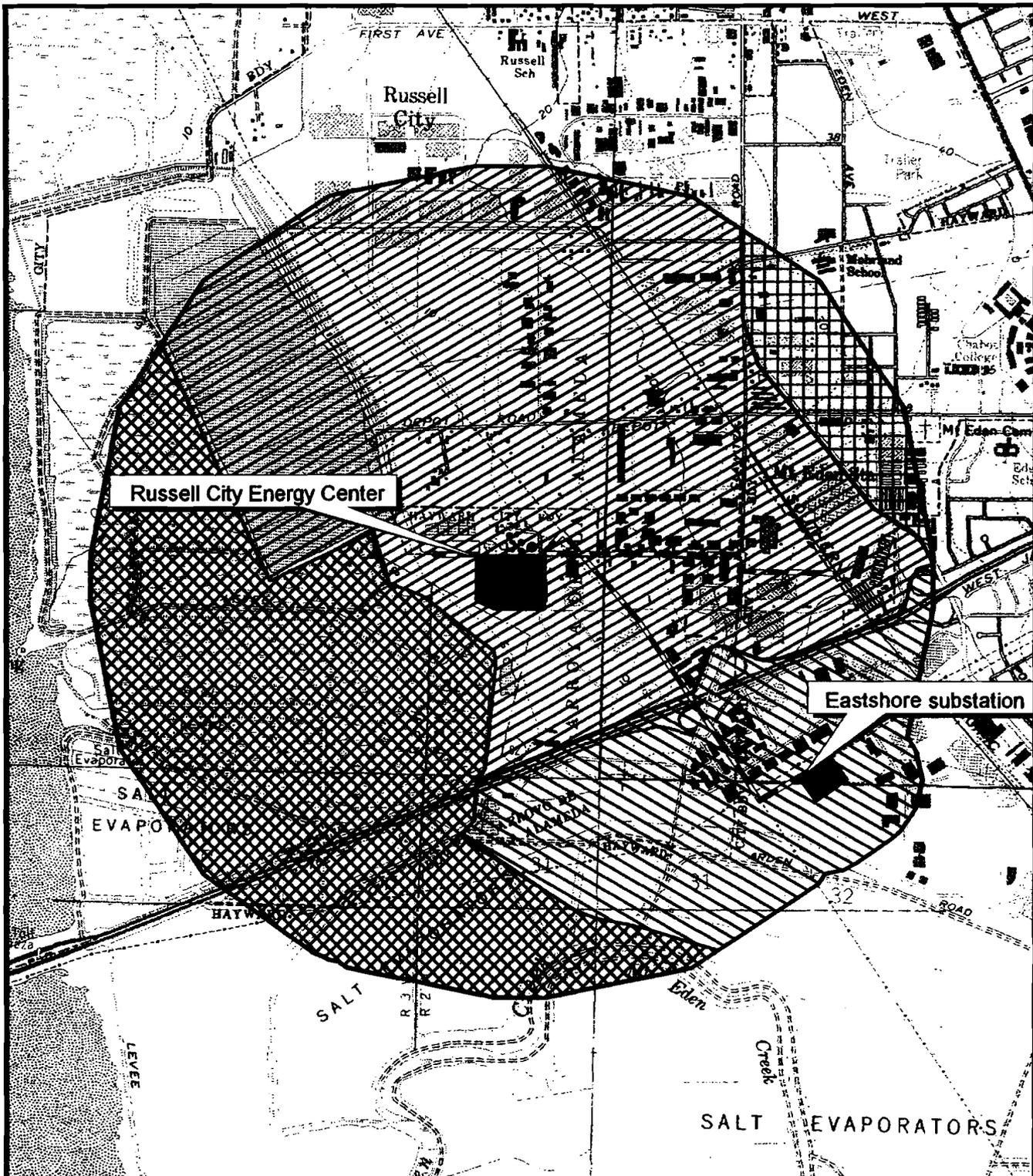
RUSSELL CITY ENERGY CENTER



FOSTER WHEELER ENVIRONMENTAL CORPORATION

Russell City Energy Center AFC

May 2001



| | |
|--|----------------------------|
| | WI - West Industrial |
| | SWI - Southwest Industrial |
| | SL - Shoreline |
| | ME - Mt. Eden |

N

0.5 0 0.5 Miles

1 : 24,000

Source: USGS Quad DRGs - GIS Data Depot

Figure 8.6-3
General Plan Designations
RUSSELL CITY ENERGY CENTER

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Russell City Energy Center AFC

May 2001

corner of Clawiter and Depot Road, a distance of 0.75 mile from the RCEC site. For a discussion of sensitive receptors within one mile of the proposed project site, refer to Section 8.9 (Public Health).

Electric Transmission Line and Eastshore Substation Expansion—There are 4 existing transmission line towers between the project site and State Route 92, and 2 towers between State Route 92 and PG&E Eastshore Substation. These towers will be replaced, at the same locations, with new tubular towers. The first tower is located at 3458 Enterprise Avenue at Bay Cities Rebar Company, while a second tower is located on the Tuscarora Corporation's property at 3440 Enterprise Avenue. A third tower is located on the property of Johnson Controls. The fourth tower is located in a Caltrans parking lot within the State Route 92 right-of-way overpass embankment. The two towers south of State Route 92 are also situated in areas that are zoned and used for industrial purposes. The electrical transmission line route covers 1.1 miles and connects with the Eastshore Substation, south of State Route 92 off Arden Road. The PG&E substation and surrounding area lies within the Hayward Industrial Corridor and is also zoned for industrial use, but this area contains more office and light industrial uses compared with the heavy industrial uses near the RCEC site (e.g., the City of Hayward's WPCF, and the Rohm and Haas paint polymers plant), north of State Route 92. Industrial developments near the PG&E substation and off Eden Landing Road were constructed more recently than those near the RCEC.

Natural Gas Pipeline—The pipeline route lies entirely in the Hayward Industrial Corridor. The proposed route will run east from the RCEC site along Enterprise Avenue, across Clawiter Road to the Berkeley Farms facility, and then continue east along the southern property line of Berkeley Farms to the east side of the Union Pacific Railroad right-of-way, where PG&E's gas distribution Line 153 is located. Land use along Enterprise Avenue consists of a large truck terminal, the City of Hayward WPCF, automotive and metal fabricating, and other light industrial uses.

Wastewater Return Pipeline—The wastewater discharge pipeline will extend across Enterprise Avenue to the City of Hayward's WPCF. Current use nearby includes the KFAX radio station transmitter, the WPCF, and the warehouse-truck terminal immediately west of the RCEC site.

AWT Plant

The local setting of the AWT plant is substantially the same as that of the RCEC plant site.

8.6.1.3 Land Use Planning and Controls

The City of Hayward General Plan provides a general and comprehensive statement of land use policies that will guide the future growth of cities and counties. The City's ordinances, in contrast, provide a specific regulatory mechanism used by the City to implement its land use policy. Zoning ordinances give jurisdictional properties a zoning designation, which corresponds to a set of "permitted" and "conditional" uses. The City's land use zones, or districts, are each subject to specific development standards and restrictions. Zoning and general plan designations for the project area are shown in Figures 8.6-2 and 8.6-3, respectively. In addition to these basic land use policies, there may be regional land use controls in a particular area that must also be considered prior to development.

General Plan Designation and Zoning

RCEC Plant Site

The project is located in the City of Hayward and hence is subject to policies stipulated in the Hayward General Plan (City of Hayward, 1998). Specifically, the Land Use Element of the General Plan defines Planning Areas and establishes the descriptions, limits, and directions for growth (Section 8.6.5).

The project site is part of the West Industrial Planning Area (WIPA) and has been designated a part of the Hayward Industrial Corridor in the General Plan. As one of several Planning Areas in Hayward, the WIPA has potential for office, warehouse, and other industrial growth.

The project site is zoned Industrial (I) (Figure 8.6-2) under the City of Hayward zoning ordinance. The purpose of this designation is to encourage the development of industrial uses in suitable areas while minimizing effects to other areas. Manufacturing, warehousing, printing, publishing, research and development, research laboratories, and wholesale business uses are permitted as primary uses in the Industrial District when not adjacent to a residentially zoned property, when not specified as an administrative or conditional use, and when the use is conducted completely within an enclosed building(s). Pertinent restrictions in the Industrial zone include a minimum lot size of 10,000 sq. ft., minimum frontage of 35 ft., and an average lot width of 70 ft. There is no maximum lot coverage limit for industrial facilities, and no limit on the height of industrial buildings.

Other predominant zoning designations within one mile of the project site are Industrial (I), Single-Family Residential (RS), and Flood Plain (FP) (City of Hayward Zoning Ordinance 1999). Also within one mile of the project site are two unincorporated areas of Alameda County that are entirely surrounded by the City of Hayward. An area along Depot Road north of the project, for example, is zoned Heavy Industrial (M-2) under the County's zoning system. This area contains several automobile salvage businesses. Areas further north along Clawiter Road and Industrial Boulevard are also under the County's zoning jurisdiction including both residential and industrial zones.

Electrical Transmission Line and Eastshore Substation Expansion—From the new RCEC switchyard, power will be transmitted through new overhead transmission lines to PG&E's existing Eastshore Substation. Lands adjacent to the transmission wires are zoned Industrial and are designated Industrial Corridor in the General Plan. The transmission line will cross State Route 92.

Natural Gas Pipeline—The natural gas pipeline will be installed within Enterprise Avenue, across Clawiter Road, and in a pipeline right-of-way within the Berkeley Farms facility. Zoning designations do not apply to city street rights-of-way. The City's General Plan designates properties adjacent to the proposed pipeline as part of the Industrial Corridor. They are zoned as Industrial (Figure 8.6-2). Zoning designations for all parcels adjacent to the pipeline corridor are also Industrial.

Wastewater Return Pipeline—The wastewater return pipeline lies within the General Plan's Industrial Corridor. The zoning designations for parcels adjacent to the wastewater discharge pipeline are Industrial.

AWT Plant

The General Plan and zoning designations for the AWT plant are the same as to those for the RCEC plant site.

Other Applicable Land Use Plans

San Francisco Bay Plan

Various regional land use controls are operative in portions of the project area. The Bay Conservation and Development Commission (BCDC), as the local coastal management agency, administers the local coastal management program including the San Francisco Bay Plan. Created in 1968, the Bay Plan is an enforceable regulatory framework to guide the future protection and use of the San Francisco Bay and its shoreline. Key features of the Bay Plan include regulation of filling and dredging in the Bay and new development within 100 feet of the shoreline, and protection of shoreline areas suitable for high priority

water-orientated uses (i.e., ports and harbors). In order to carry out the Bay Plan, a permitting system has been established for certain activities on lands within the BCDC's jurisdiction, which includes the following areas:

- The open water, marshes, and mudflats of greater San Francisco Bay, including Suisun, San Pablo, Honker, Richardson, San Rafael, San Leandro and Grizzly Bays, and the Carquinez Strait
- The first 100 feet inland from the shoreline around San Francisco Bay
- The portion of the Suisun Marsh including levees, waterways, marshes and grasslands below the 10-foot contour line
- Portions of most creeks, rivers, sloughs and other tributaries flowing into San Francisco Bay
- Salt ponds, duck hunting preserves, game refuges, and other managed wetlands that have been diked off from San Francisco Bay (BCDC 1999)

A permit from the BCDC is required if there are plans to perform any of the following activities within the BCDC jurisdictional area:

- Place solid material; build or repair docks, pile-supported or cantilevered structures; or dispose of material or moor a vessel for a long period in San Francisco Bay or in certain tributaries that flow into the Bay
- Dredge or extract material from the bottom of the Bay
- Substantially change the use of any structure or area
- Construct, remodel, or repair a structure
- Subdivide property or grade land (BCDC 1999).

According to the BCDC (Lisa Bennett, personal communication, February 13, 2001), the RCEC site does not lie within BCDC jurisdiction. The marshlands (Hayward Area Recreation District [HARD] marsh) to the south of the RCEC site are not within the Bay shoreline zone, because they are not tidally influenced. These are instead freshwater marshlands fed by runoff, treated wastewater from the Union Sanitary District, and periodic infusions of Bay water intentionally released into the area to create a brackish marsh. The BCDC jurisdiction under the McAteer-Petris Act and the San Francisco Bay Plan extends 100 feet from the actual Bay shoreline, about one mile west of the RCEC site.

Hayward Area Shoreline Plan

The Hayward Area Shoreline Plan was developed in 1974 and updated in 1993 by the Hayward Area Shoreline Planning Agency (HASPA) (HASPA 1993). HASPA is a joint cooperative planning agency with representatives from the City of Hayward, East Bay Regional Parks District, Hayward Area Recreation District, Hayward Unified School District, and San Lorenzo Unified School District. HASPA's Planning Area consists of all land in the City of Hayward west of the Union Pacific Railroad tracks to the bayshore. HASPA's purpose is long-range planning of the shoreline area and the enhancement and environmental restoration of wetlands in public ownership near the shoreline. One of the key purposes of HASPA is to coordinate the management and development of land held in public ownership within the Planning Area. HASPA is an advisory, rather than a jurisdictional or regulatory body.

HASPA's Planning Area includes about one-third of the City of Hayward Industrial Corridor. Much of this land, particularly in the western and southern areas, however, consists of marshland, landfill, and salt evaporation ponds. Open land north of State Route 92, about one-quarter of the HASPA Planning Area, is mostly in public ownership (City of Hayward, East Bay Regional Parks, State of California). Open land south of State Route 92 within the Planning Area is mostly privately held, and much of this is owned by the Cargill Corporation and operated as salt evaporation ponds.

HASPA is coordinating open space development in the HASPA Planning Area through implementation of the Hayward Area Shoreline Plan. As of 1998, HASPA had acquired 1,800 acres of shoreline property, sponsored marsh restoration (HARD Marsh, Triangle Marsh), and developed 8 miles of shoreline trails. The Shoreline Interpretive Center is a key educational outreach facility for HASPA. The key program objectives of HASPA are:

- Protect environmental resources such as wetlands and habitat for endangered and threatened species
- Preserve historical resources, such as landings and salt production sites
- Promote education and research
- Provide recreational opportunities, particularly through the shoreline trail system
- Encourage industrial development and traffic circulation improvements and promote industrial in-fill development in areas designated for industrial and public utilities
- Support land management efforts (mosquito abatement, shoreline erosion control, alien species management, etc.)

8.6.1.4 Future Land Use Trends

A considerable increase in East Bay area growth is expected over the next decade. Alameda County's population is expected to increase by approximately 22 percent from 2000-2020 (ABAG Projections 2000) with a population of 1,654,485 by the year 2010. Increases in population will undoubtedly spur further residential development in Hayward and elsewhere in the county. This growth is expected to continue well into the future. An overflow of high technology activities from Silicon Valley into the Hayward area has caused significant industrial expansion and this trend is expected to continue into the future. Hayward has become an attractive location for high technology manufacturing and research and development facilities because of appropriately zoned land and accessibility to affordable housing.

One of the effects of the Silicon Valley spillover has been the increased use of the Hayward Industrial Corridor for business and office-related uses, leading to a higher density of employees than is usual for a light and heavy industrial area and resulting in higher than planned traffic congestion, shortages of parking, and the conversion of warehousing space to office space within the Industrial Corridor. The City of Hayward has addressed these issues in a background paper developed as part of the General Plan Update that will be completed during 2001 (City of Hayward 2001a). Recommendations have included: 1) greater segregation of uses within the Industrial Corridor (for example, more separation of manufacturing, warehousing, and business park uses or rezoning the district for greater segregation of uses); 2) allowing automobile parking on the street under certain circumstances, 3) imposing a minimum lot size to prevent the excessive subdivision of parcels, and 4) placing a high priority on increased transit access within the Industrial Corridor.

As part of the General Plan update, the City has also addressed “smart growth” principles (City of Hayward 2001b). Smart growth principles are intended to counteract what contemporary planners see as problems associated with urban sprawl. Higher density housing that is served by public transit, mixed development of housing and commercial uses, pedestrian-friendly neighborhoods, and open space preservation and development are seen as planning principles that will help to coordinate development and retain a strong sense of place, better quality housing, and higher quality of life. Examples of transit-oriented development include the new housing complex located adjacent to the Hayward City Hall and Bay Area Rapid Transit station. The City has examined smart growth principles in relation to five key “change areas” in the City, one of which is the Industrial Corridor. Future planning efforts for the Industrial Corridor may include a better mix of residential, retail commercial, and housing uses where appropriate, in portions of the Industrial Corridor that are occupied primarily by business parks and office uses.

Within the last eighteen months (11/15/99 – 5/5/01), the City of Hayward has conducted discretionary reviews and approved the following projects within 2 miles of the RCEC project site:

- Use permit for a two-story office building at 25700 Industrial Boulevard near Depot Road
- Staples and Walgreens commercial development at West Winton Avenue and Hesperian Boulevard
- Industrial development (50,000 square feet) at 24600 Industrial Boulevard, adjacent to residential area

8.6.2 Environmental Consequences

Potential impacts to land use are evaluated by comparing project characteristics with the regional and local land use environment. A summary of effects to land use and zoning designations within one mile of the power plant site and within 0.25 mile of the project’s linear routes is presented in Table 8.6-1.

Table 8.6-1. General Plan/zoning amendment matrix.

| Project Features | General Plan Designation | GP Amendment? | Zoning Designation | Rezone Required? | Other Requirements |
|--|---------------------------------|----------------------|---------------------------|-------------------------|---------------------------|
| Electric transmission line | Industrial Corridor | No | Industrial | No | Encroachment permit |
| Natural gas pipeline | Industrial Corridor | No | Industrial | No | Encroachment permit |
| Water supply and wastewater return pipelines | Industrial Corridor | No | Industrial | No | Encroachment permit |
| AWT plant | Industrial Corridor | No | Industrial | No | Encroachment permit |

8.6.2.1 Significance Criteria

Criteria used in determining whether project-related land use impacts are significant are consistent with standard industry practice and California Code of Regulations Title 14, §15065. An impact is determined to be significant if it:

- Physically divides an established community

- Conflicts with any applicable land use plans, policies, or regulations of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect
- Conflicts with any applicable habitat conservation plan or natural communities' conservation plan

8.6.2.2 Potential Effects on Land Use

This section discusses the general project effects on land use, followed by specific potential effects of each project element. As shown in Table 8.6-1, neither the project nor any of its associated facilities will require a General Plan amendment or zoning re-designation. An encroachment permit from the City of Hayward will be required for the natural gas pipeline, or utility easement.

Consistency with the General Plan and Zoning Ordinance

The proposed RCEC project is consistent with and furthers in many respects the goals and policies of the City of Hayward General Plan. Specifically, the RCEC is an industrial land use within a designated Industrial Corridor, consistent with the General Plan.

The Russell City Energy Center would further key goals and policies stated in the General Plan's Land Use, Economic Development, and Growth Management Elements, and is consistent with the goals and policies of the other elements, as noted below:

- The Housing and Neighborhood Preservation section of the General Policies Plan identifies the West Industrial area of the City as representing great potential for industrial growth in Hayward.
- The Economic Development portion of the Hayward General Policies Plan recognizes the importance of the economic health of the City. This element states that the City's fiscal health is dependent upon maintaining a dynamic economic climate and points out the importance of developing or increasing the Hayward tax base and employment opportunities in the City of Hayward. The Economic Development Element lists a number of policies based on these issues. The RCEC would promote achievement of Policy II ("create a sound local economy which attracts investment, increases the tax base, creates employment opportunities for residents, and generates public revenues"), Policy III ("facilitate the development of employment opportunities for residents"), and Policy V ("attract new businesses").
- The Circulation Element of the General Policies Plan sets forth concerns about increased traffic generation from economic development. The RCEC is consistent with the Plan's goal of improving traffic circulation in that the RCEC is a relatively low traffic generator compared to other types of industrial development.

RCEC Plant Site

The proposed project site will not have a significant impact on the surrounding area under the CEQA thresholds presented above. The project will be located in an industrial area that is separated by design from the rest of the community, including residential developments found to the east. The nearest residential area is approximately 0.82 miles from the RCEC property line. Since the project is industrial in nature and will be located in an industrial area, it is consistent with surrounding land uses and would

not physically divide any elements of the local community. The proposed architectural design of the RCEC would contribute to an enhanced appearance of the City's western gateway area. The project is sited in an area where the neighboring land uses are mostly light and heavy industrial, including the City's wastewater treatment plant, Rohm and Haas paint polymers plant, Gillig bus manufacturing facility, and Berkeley Farms dairy products processing facility.

Section 10 of the City of Hayward's General Policies Plan states that determination of conformance of a proposed use or zone with the General Plan should include consideration of the following questions:

- 1) Is the use specifically designated on the Policies Plan Map in the area where its location is proposed?

Answer: Yes, the proposed RCEC is an industrial use, to be located in the area designated Industrial Corridor.

- 2) Are conditions in the area safe from potential flooding and geologic hazards not common to the entire Hayward Planning Area?

Answer: Yes. According to the Federal Emergency Management Agency (FEMA) flood insurance rate map (Community Panel Nos. 065033-0019E and 065033-018E), the RCEC is located in Zone C (area of minimal flooding) and is not within a 100-year or 500-year floodplain.

- 3) Will community facilities and streets be available at City standards to serve the proposed property use?

Answer: Yes. City streets and City utilities serve the location. Water is available from the City of Hayward, and treated wastewater would be available from the Hayward Water Pollution Control Facility.

- 4) Is the proposal consistent with policies, principles and standards contained in the General Plan?

Answer: Yes. The Energy Center furthers important goals and policies in the General Plan, including the Economic Development and Growth Management elements. Conditions of certification specified in the California Energy Commission license for the RCEC, if granted, would ensure that environmental, noise, and conservation element policies would be attained.

- 5) Do social and economic conditions indicate that the proposed zoning or development is needed at this time?

Answer: Yes. California is currently facing a significant energy shortage. Governor Gray Davis is encouraging the development of new energy facilities. Hayward, and the San Francisco Bay Area in general, require additional local electric energy generation to avoid a decline in the reliability and quality of electric power service.

- 6) Does an evaluation of required environmental impact reports and any potential public benefit analyses indicate that the use or zone justifies any adverse impact the proposal may have on the area involved?

Answer: The CEC licensing process provides a thorough evaluation of environmental impacts and analyses of potential public benefit. The CEC licensing process, under the Warren-Alquist Act, is equivalent to CEQA review at the level of an Environmental Impact Report.

The RCEC is consistent with the City of Hayward Zoning Ordinance as a planned industrial use located in the Industrial Corridor, which is an Industrial District. As a manufacturing use, or a use very similar to manufacturing, the RCEC would be considered a permitted use, not requiring a General Plan Amendment, rezone, or variance. City of Hayward Department of Community and Economic Development Staff have prepared a Staff Report offering their opinion that the RCEC should be considered a permitted use similar to manufacturing (Appendix 8.6-A).

Land uses south and west of the project consist mainly of natural resource conservation. There is a vacant lot owned by the Waste Management Corporation immediately south of the RCEC site. Further south lies City property used as a stormwater retention basin. Still further south, across the flood control channel, is a natural brackish marshland owned by the City of Hayward, which connects with the salt marsh harvest mouse preserve along State Route 92. Further west is the HARD marsh, jointly managed by the East Bay Regional Parks District and Hayward Area Recreation District. These areas lie outside of the Industrial zone in the Floodplain zone. The RCEC will not significantly conflict with these land uses. Noise levels from the energy center will be low such that wildlife can easily adapt (see Section 8.7, Noise). There are no significant levels of vibration from a facility such as the RCEC. Though the project could provide perching sites for predatory raptors, this could be easily mitigated. Recreational and educational use of the shoreline area will take place at a sufficient distance from the RCEC such that there will be no significant visual or noise impacts on recreational users in this zone (see Section 8.13, Visual Resources). Other potential effects on wildlife and, in general, the use of the neighboring area as a natural resources conservation area, would not be significant and would not conflict with these uses, with appropriate mitigation measures (see also Section 8.2, Biological Resources).

Electrical Transmission Line and Eastshore Substation Expansion—Construction of the new transmission towers will be performed segment by segment, so as to disrupt traffic as little as possible. Most of the tower replacement sites are located in parking lots or industrial lots of existing businesses. The electric transmission line will not conflict with local zoning regulations or with the goals of the General Plan for the City of Hayward.

Natural Gas Pipeline—The proposed natural gas pipeline will be placed in Enterprise Avenue, across Clawiter Road, and in a pipeline corridor near the south boundary of the Berkeley Farms property. Since the pipeline will be buried, it will not directly or permanently affect surrounding land uses. Temporary, indirect impacts to nearby businesses will occur due to standard construction practices that may slow and/or re-route traffic. Pipeline construction will take two to three months or less. Affected areas will only experience short-term impacts since the pipeline will be constructed on a segment-by-segment basis. Once the pipeline is completed, there will be no impacts to local transportation patterns.

The City of Hayward's General Plan does not specifically address regulation of underground utilities. The City's Industrial Corridor Plan governs land adjacent to the proposed pipeline route; pipeline construction and operation will not conflict with the goals and policies of this particular plan. Since local zoning regulations do not apply to street rights-of-way, the proposed natural gas pipeline will not conflict with local zoning regulations. The only permit required for construction of the gas pipeline will be an encroachment permit issued by the City of Hayward.

Wastewater Return Pipeline—The wastewater return line will cross under Enterprise Avenue to the City of Hayward Water Pollution Control Facility. There will be minimal impacts to local transportation patterns due to construction of the new pipeline. Since local zoning regulations do not apply to street rights-of-way, the proposed wastewater pipeline will not conflict with local zoning regulations.

AWT Plant

Consistency of the AWT plant with the General Plan and zoning ordinances will be substantially similar to that of the RCEC plant site.

8.6.3 Cumulative Impacts

Since the project will not cause significant land use impacts, it will not contribute to significant cumulative impacts on land use.

8.6.4 Proposed Mitigation Measures

There are no significant land use impacts related to the project site and the natural gas pipeline. An encroachment permit will be obtained prior to construction of any project facilities, and all mitigation measures stipulated in any such permit will be followed.

8.6.5 Applicable Laws, Ordinances, Regulations, and Standards

All applicable laws, ordinances, regulations, and standards and their conformance measures are detailed in the text below. Table 8.6-2 summarizes this information and provides agency contacts. Table 8.6-3 presents the land use permit schedule.

8.6.5.1 Federal

The Federal Aviation Administration Act and its implementing regulations (14 CFR 77) apply to any structure taller than 200 feet above ground surface at the site of the structure, within three nautical miles of the nearest runway. The RCEC exhaust stacks will be 145 feet tall and thus a permit from the FAA will not be required.

8.6.5.2 State

State LORS that apply to this project include:

Warren-Alquist Energy Resources Conservation and Development Act

Provisions in the Warren-Alquist Energy Resources Conservation and Development Act (Public Resources Code [PRC] 25000 et seq.) are directly and indirectly related to land use. The provisions state, among other things, that:

The following areas of the state shall not be approved as a site for an energy generating facility, unless the commission finds that such use is not inconsistent with the primary uses of such lands and that there will be no substantial adverse environmental effects and the approval of any public agency having ownership or control of such lands is obtained: (a) State, regional, county and city parks; wilderness, scenic or natural reserves; areas for wildlife protection, recreation, historic preservation; or natural preservation areas in existence on the effective date of this division; and (b) Estuaries in an essentially natural and undeveloped state. In considering applications for certification, the commission shall give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical, archaeological, and cultural sites; lands of hazardous concern; and areas under consideration by the state or the United States for wilderness, or wildlife and game reserves. (PRC §25527)

The proposed project will conform to PRC §25527 since project lands are not located in either of these areas.

Table 8.6-2. Laws, ordinances, regulations, and standards (LORS).

| LORS | Document/Section | Applicability | AFC Section Where Conformance is Discussed |
|--|---|---|--|
| Federal | No permits required | — | — |
| State | | | |
| Encroachment permit for excavation in public roadway | CA Streets and Highways Code, Division 2, Chapter 5.5, Sections 1460-1470 | Encroachment permit will be necessary for construction of portions of the natural gas and water and wastewater return pipelines | Section 8.6.2.2 |
| Local | | | |
| General Plan Designations | Hayward General Plan | Development within the jurisdiction of the city is subject to provisions in the General Plan | Section 8.6.2.2 |

McAteer-Petris Act

The McAteer-Petris Act (California Government Code Title 7.2, §66600 et seq.) established the Bay Conservation and Development Commission to administer the Federal Coastal Zone Management Act in the San Francisco Bay Area, and to implement the San Francisco Bay Plan. The BCDC’s requirements are discussed above, as incorporated in the Warren-Alquist Act and as they apply specifically to power plants. BCDC’s jurisdiction is the San Francisco Bay, some adjoining drainage areas, and the bay’s shoreline band. As mentioned above, BCDC jurisdiction does not apply to the project.

California Streets and Highways Code

Under the California Streets and Highways Code, Division 2, Chapter 5.5, Sections 1460-1470, an encroachment permit is required if there is an opening or excavation for any purpose in any county highway. The RCEC will conform to Section 1460-1470 by obtaining an encroachment permit from the Hayward Public Works Department prior to natural gas pipeline construction.

8.6.5.3 Local

Local LORS that would apply to the project include the following:

General Plan(s)

Land use provisions must be included in every California city and county General Plan (Government Code §65302). Local governments may also adopt plans for sub-areas such as communities and neighborhoods, and may adopt “special area plans” that detail implementation measures for an area requiring concentrated planning attention (e.g., an historical district).

Since the project is located entirely within an Industrial area and is consistent with the intended uses, plans, and policies of the Industrial Corridor land use designation, it will conform to the Hayward General Plan. The generation facility will be the only use visible after construction (since the pipeline will be buried under city streets). The tallest structures at the project site (145 feet) would be considerably lower than the existing KFAQ radio towers (228 feet) and also would be lower than the stack at the Rohm and Haas paint polymers plant nearby (180 feet). The project will not effect existing uses or opportunities in the Industrial Corridor since it will be on land that is currently industrial.

Zoning Ordinance

Zoning is the regulatory mechanism used to implement land use policy. Most city planning and building departments enforce zoning ordinances. The proposed project is subject to the Hayward Zoning Ordinance and will comply with it. Hayward zoning designations in the project area are shown on Figure 8.6-2. The project site is currently zoned Industrial District, a use that allows a broad range of industrial activities. The City staff have offered their opinion that the RCEC would be a permitted use in the Industrial District (see Appendix 8.6).

San Francisco Bay Plan

The San Francisco Bay Plan applies to all areas under the jurisdiction of the BCDC. The Plan is an enforceable regulatory mechanism to guide the future protection and use of the San Francisco Bay and its shoreline. The RCEC and AWT plant site are not within BCDC jurisdiction or maritime priority use areas.

8.6.6 Involved Agencies and Agency Contacts

Table 8.6-3 contains a list of agencies and contact persons.

Table 8.6-3. Agencies and contact persons.

| Agency | Contact | Title | Telephone |
|-----------------|-------------|-----------------------------|----------------|
| City of Hayward | Dan Garcia | Development Review Engineer | (510) 583-4208 |
| City of Hayward | Gary Calame | Sr. Planner | (510) 583-4226 |

8.6.7 Permits Required and Schedule

Table 8.6-4 outlines the permit schedule related to land use issues for the RCEC and AWT plant project. Information required to obtain each permit is also included.

Table 8.6-4. Permit/application schedule for land use.

| Permit/Application | Schedule |
|--|--|
| Encroachment permit for water and natural gas pipelines: <ul style="list-style-type: none">• Site specific plan• Pipeline routes• Road rights-of-way where pipelines will be constructed | 1 to 2 weeks from application submittal to approval by Public Works Department |

8.6.8 References

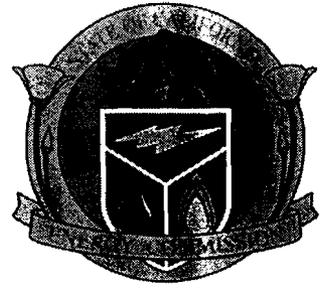
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Russell City Energy Center AFC

May 2001



Arnold Schwarzenegger
Governor

IMPACTS OF NITROGEN DEPOSITION ON CALIFORNIA ECOSYSTEMS AND BIODIVERSITY

Prepared For:

California Energy Commission
Public Interest Energy Research Program

Prepared By:

**Bren School of Environmental Science
and Policy, University of California,
Santa Barbara
Creekside Center for Earth
Observations**

PIER FINAL PROJECT REPORT

May 2006
CEC-500-2005-165



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Preface

The Public Interest Energy Research (PIER) Program supports public interest energy research and development that will help improve the quality of life in California by bringing environmentally safe, affordable, and reliable energy services and products to the marketplace.

The PIER Program, managed by the California Energy Commission (Energy Commission), annually awards up to \$62 million to conduct the most promising public interest energy research by partnering with Research, Development, and Demonstration (RD&D) organizations, including individuals, businesses, utilities, and public or private research institutions.

PIER funding efforts are focused on the following RD&D program areas:

- Buildings End-Use Energy Efficiency
- Energy-Related Environmental Research
- Energy Systems Integration
- Environmentally Preferred Advanced Generation
- Industrial/Agricultural/Water End-Use Energy Efficiency
- Renewable Energy Technologies

What follows is the final report for the contract Assessment of Nitrogen Deposition: Modeling and Habitat Assessment, contract number 500-99-013, Work Authorization 61, conducted by the Bren School of Environmental Science and Policy at the University of California Santa Barbara, and the Creekside Center for the Earth Observations. The report is entitled *Impacts of Nitrogen Deposition on California Ecosystems and Biodiversity*. This project contributes to the Energy-Related Environmental Research program.

For more information on the PIER Program, please visit the Energy Commission's website www.energy.ca.gov/pier/ or contract the Energy Commission at (916) 654-5164.

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Abstract

Recognized as a "biodiversity hotspot," California supports numerous endemic taxa with narrow ranges, and that diversity may be threatened by atmospheric nitrogen deposition. This California-wide risk screening included: (1) a 36 x 36 kilometer (km) map of total Nitrogen deposition for 2002, developed from the Community Multiscale Air Quality Model (CMAQ); (2) identification of sensitive habitats; (3) an overlay of the Forest Resource and Protection (FRAP) vegetation map; (4) an overlay of animal and plant species occurrence data from the California Natural Diversity Data Base (CNDDDB); (5) an initial analysis of species life history and habitat; and (6) a discussion of relevance and guidance for assessments of power plant impacts. An area of 55,000 square kilometers (km²) of California is exposed to more than 5 kilograms of N per hectare per year (kg-N ha⁻¹ year⁻¹), and 10,000 km² are exposed to more than 10 kg-N ha⁻¹ year⁻¹. Deposition hotspots include: Los Angeles-San Diego, the San Francisco Bay Area, the Central Valley, and the Sierra Nevada foothills. The major documented impact of N-deposition on California terrestrial biodiversity is to increase invasive annual grasses in low biomass ecosystems, resulting in species loss. Of 225 "threatened" and "endangered" plant taxa, 99 are exposed to an average > 5 kg-N ha⁻¹ year⁻¹. Of 1022 "rare" plant taxa, 290 are exposed to > 5 kg-N ha⁻¹ year⁻¹. Listed animal species follow similar patterns. This initial screening outlines potential impacts on California's biodiversity and provides targeted guidance for assessing the impacts of power plant and other sources of atmospheric N-deposition.

Keywords: nitrogen deposition, biodiversity, California, annual grasses, invasive species, deserts, grasslands, threatened and endangered species, eutrophication

Executive Summary

Introduction

Atmospheric nitrogen deposition alters the structure and function of terrestrial ecosystems, because nitrogen is often a primary limiting nutrient on overall productivity. These alterations can drive losses of biodiversity, as nitrophilous species increase in abundance and outcompete species adapted to more oligotrophic conditions. California is recognized as a “biodiversity hotspot,” with a high fraction of endemic taxa with narrow ranges, and many of those taxa may be at risk from atmospheric nitrogen deposition.

Project Objectives

The California Energy Commission’s Public Interest Energy Research (PIER) program funded a project to investigate the potential scope of nitrogen deposition (N-deposition) risks to biodiversity in California. This statewide risk screening includes the following elements: (1) identification of sensitive habitat types, as documented by literature and local expertise; (2) a 36 x 36 kilometer (km) map of total N-deposition for 2002, developed from the Community Multiscale Air Quality Model (CMAQ); (3) an overlay of a statewide Forest Resource and Protection (FRAP) vegetation map; (4) an overlay of animal and plant species occurrence data from the California Natural Diversity Data Base (CNDDDB); (5) a compilation of life history and habitat requirements for each species; and (6) a discussion of relevance and guidance for assessments of power plant impacts over which the Energy Commission has regulatory authority.

Project Outcomes

The major documented impact of N-deposition on California terrestrial biodiversity is to increase growth and dominance of invasive annual grasses in low biomass ecosystems such as coastal sage scrub, serpentine grassland, and desert scrub. Lichen communities may be altered. Vernal pools and sand dunes are vulnerable to annual grass invasions that are likely enhanced by N-deposition. Oligotrophic mountain lakes are also vulnerable.

Conclusions

The CMAQ model indicates that an area of 55,000 square kilometers (km²) (out of California’s total area of 405,205 km²) are exposed to more than 5 kilograms of N per hectare per year (kg-N ha⁻¹ year⁻¹),¹ and 10,000 km² are exposed to more than 10 kg-N ha⁻¹ year⁻¹. Deposition hotspots include the major urban areas (Los Angeles-San Diego, and the San Francisco Bay Area), agricultural areas of the Central Valley, and portions of the Sierra Nevada foothills. Exposure of 48 different FRAP vegetation types were calculated. For example, 800 km² out of a total 6300 km² of coastal sage scrub are exposed to more than 10 kg-N ha⁻¹ year⁻¹, primarily in Southern California.

¹ Throughout the discussion of N-deposition exposure, a benchmark of 5 kg-N ha⁻¹ yr⁻¹ is used. This benchmark does not imply that 5 kg-N ha⁻¹ yr⁻¹ is the critical load for negative impacts for all ecosystems—some may be more sensitive and some may be less sensitive. Data are presented so that any benchmark can be used.

In contrast, many high elevation (> 1500-meter) montane vegetation types are minimally exposed, because they are far from pollution sources, except for localized occurrences in mountains surrounding the Los Angeles Basin. Of 225 federal and state listed "threatened" and "endangered" plant taxa, 101 are exposed to an average greater than 5 kg-N ha⁻¹ year⁻¹. Of an additional 1022 plant taxa listed as "rare," 288 are exposed to greater than 5 kg-N ha⁻¹ year⁻¹. Many of these highly exposed taxa are associated with sensitive habitat types and are vulnerable to annual grass invasions. The CNDDDB was not of sufficient resolution or completeness to support finer-scale regional analyses. This initial, broad-scale screening indicates that N-deposition poses large potential impacts on California's unique biodiversity.

Recommendations

1. Based on the review and broad-scale screening in this report, nitrogen deposition impacts on ecosystems and species are extensive in California, and should be considered in local environmental assessments.
2. The impacts of N-deposition on California ecosystems are generally cumulative. Establishing critical cumulative loads for particular ecosystems is a research priority.
3. Local environmental assessments should initially focus on low biomass, nutrient poor habitats and the rare species they support, but also consider more general impacts. The state-wide information in this report provides a start, but is not sufficient for local use.
4. Increased invasions by introduced annual grasses and other weeds are the major threat to consider in mitigation. Finding a balance between habitat acquisition, habitat management, and weed management that effectively mitigates the incremental impacts of new power plant sources is a key goal.
5. Establishing reliable bioindicators along N-deposition gradients, such as changes in lichen communities, plant nutrient balances, and degree of weed invasions, will provide better spatial resolution of ecosystem effects.
6. The complexity of N-deposition forces a transdisciplinary approach to any research program.

Benefits to California

Nitrogen deposition is a growing threat to the biodiversity of California. This report is the first statewide analysis of exposure of ecosystems and special-status species to N-deposition, and provides the basis for systematic assessment of threats to specific ecosystems, and development of mitigation and management techniques. Along with an accompanying report on modeling by Tonnesen and Wang, this report provides regulatory guidance for impact assessments of new power plants. The report will provide an impetus for additional research for better understanding this complex phenomenon.

1.0 Introduction

Atmospheric nitrogen deposition has been demonstrated to alter terrestrial and aquatic ecosystem function, structure, and composition in many parts of the world, including Europe, Eastern North America, and Western North America (Galloway, Aber et al. 2003). Emissions, deposition, and N-cycling are highly complex processes and pose many scientific and policy challenges. The major purpose of this report is to examine the known and potential impacts of N-deposition on the varied ecosystems and species in California, using biogeographic data and modeled N-deposition.

Nitrogenous air pollutants have many sources, including transportation, agriculture, industry, electricity generation, wildfire, and emissions from natural and semi-natural ecosystems. Electric power plants in California, primarily fired by natural gas, are major point sources of nitrogen oxides (NO_x) from combustion, and ammonia (NH₃) from selective catalytic reduction (SCR) units used to control NO_x emissions. The California Energy Commission (Energy Commission), in conjunction with other regulatory agencies, is responsible for assessment of environmental impacts from energy-related developments and activities, including siting of new power plants.

Biology staff at the Energy Commission analyzed potential impacts from nitrogen deposition on several power plant licensing cases (Table 1, California Energy Commission 2003, 2001a, 2001b, 1997a, 1997b). These power plants were located in areas where nitrogen deposition impacts to nitrogen-poor, sensitive plant communities are an issue. Such communities are often rare and support many of California's rare and endangered plant and animal species. It is expected that future siting cases may need to review the impact of a power plant emissions on nitrogen-saturated or nitrogen-limited ecosystems. Nitrogen saturation has several detrimental effects, including decreased plant function as a result of leached nutrients (e.g., calcium) from the soil; loss of fine root biomass; decreases in symbiotic mycorrhizal fungi; promotion of exotic invasive species; and, leaching losses of base cations and nitrate into surface waters and ground waters, which increases soil and surface water acidification.

Table 1. California power plant licensing cases

| Name | County |
|--------------------------------------|---------------|
| Metcalf Energy Center | Santa Clara |
| Los Esteros Critical Energy Facility | Santa Clara |
| Gilroy Peaker Plant | Santa Clara |
| Pico (Donald Von Raesfeld) | Santa Clara |
| Otay Mesa | San Diego |
| Sutter | Sutter |

The PIER program funded a project to address these issues. The scope of work specifies four broad tasks: (1) a critical review of various air quality models used to determine power plant emissions of nitrogen (nitrogen oxide (NO), nitrogen dioxide (NO₂), and NH₃) concentration, release rate, dispersion, and deposition at ground level; (2) a chemical analysis of power plant plume characteristics including reaction rate from gas

to particulate; (3) an assessment of nitrogen-limited habitats that could be at higher risk from further nitrogen deposition, and (4) location of nitrogen-saturated soils/ecosystems in California. Generally, the Energy Commission is interested in assessing impacts to terrestrial ecosystems from nitrogen deposition during power plant commissioning and operation and understanding the validity, strengths and weaknesses of models used to determine this impact. Specifically, the interest is in the short-distance and long-distance nitrogen deposition impacts to nitrogen-limited habitats and species dependent upon those habitats.

The project was awarded to the University of California, Santa Barbara (UCSB) (Dr. Frank Davis P.I.) and the University of California, Riverside (UCR) (CE-CERT, Dr. Gail Tonnesen P.I.). This report presents investigations by UCSB into the biotic impacts of N-deposition (topics 3 and 4). Modeling reviews and assessments (topics 1 and 2) are the subject of an accompanying report by the UCR group (Tonnesen and Wang forthcoming).

Apart from this introduction, this biotic impacts report consists of four sections. Section 2 contains a review of existing information and research on N-cycling and the effects of N-deposition on ecosystems in general and California ecosystems in particular. Section 3 describes the spatial distribution of total N-deposition in California at 36 x 36 kilometer (km) scale, using the Community Multiscale Air Quality model (CMAQ) , and the exposure of vegetation types from the Fire and Resource Assessment Program (FRAP) map. Section 4 describes the N-deposition exposure of plant and animal species from the California Natural Diversity Data Base (CNDDDB), along with relevant habitat and life history information of those species with higher exposure. Section 5 provides a synthesis and recommendations for further research.

2.0 Review

This review of existing information and research on the effects of nitrogen deposition on sensitive habitats in California draws heavily from a number of edited volumes and review papers regarding multiple aspects of N-deposition (and air pollution in general) in ecosystems (Langran 1999; Bell and Treshow 2002; Bytnerowicz, Arbaugh, et al. 2003), and especially from recent review work of N-deposition and ecological effects in Western North America (Fenn, Baron et al. 2003; Fenn; Haeuber et al. 2003). Interested readers should consult those works for extensive bibliographies of primary research, as there are hundreds of scientific papers dealing with various aspects of N-deposition.

This review will describe key processes in the nitrogen cycle, N-limitations in California terrestrial and aquatic ecosystems, effects of chronic deposition on N-cycling, and mechanisms by which N-deposition can lead to impacts on sensitive species, including direct toxicity, changes in species composition, and enhancement of invasive species. Ecosystems and habitats that are known to be and suspected to be sensitive to N-deposition are listed and specific mechanisms are briefly discussed as background for the biogeographic screening of habitats and species.

2.1. The Nitrogen Cycle

A basic understanding of the nitrogen cycle is essential background for assessing N-deposition impacts on ecosystems. The intricacies of the N-cycle involve diverse plants, animals, fungi, and bacteria interacting in complex aboveground and belowground environments (Schlesinger 1997), and a full discussion is well beyond the scope of this review. Figure 1 outlines key elements of the N-cycle that are relevant to this review.

Nitrogen (N_2) is the most abundant gas in the atmosphere (78%), but the strong triple bond is difficult to break and the gas is relatively inert. Reactive N (N_r) that can be directly used by organisms includes oxidized and reduced inorganic N and numerous forms of organic N. Inputs of N_r to ecosystems include biological N-fixation and atmospheric deposition. Atmospheric N_2 is directly available only to plants with N-fixing symbiotic bacteria. N-fixing plants in California include the Fabaceae (legumes), several genera in the Rosaceae, the genus *Ceanothus* (Rhamnaceae), and alders (Betulaceae). N-fixing cyanolichens are prominent in many ecosystems. Free-living cyanobacteria such as *Nostoc* are present in most ecosystems, and can be abundant in cryptobiotic crusts in deserts. N-fixation can vary from $< 1 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ in habitats that are poor in N-fixers to $> 100 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ in stands of alders, and other N-fixing trees and shrubs.

ultimately by bacteria and fungi that mineralize organic nitrogen to ammonium (NH_4^+). While microbial biomass may be a small component of soil organic matter, microbial biomass is the key component through which a large portion of N is processed. The depolymerization of proteins into amino acids is a key step in N-availability, and amino acids may be taken up directly by microbes and plants—organic N in soils is difficult to study and relatively poorly understood (J. Schimel, pers. comm.). Turnover of fine roots also contributes to organic matter. Decomposition and mineralization rates generally increase with temperature, and show a hump-shaped relationship with moisture—slow in dry soils, faster up to an optimal moisture level, and slower in waterlogged soils. Either temperature or moisture may be seasonally limiting. The rate of litter decomposition, even under ideal temperature and moisture conditions, is affected by the litter carbon-to-nitrogen (C:N) ratio—high C:N litter generally decomposes more slowly than low C:N litter, although excess N in litter can slow decomposition as well. The coniferous and sclerophyllous evergreen species characteristic of many California ecosystems tend to produce high C:N litter, deciduous trees generally produce lower C:N litter. Many annual grasses produce lower C:N litter. Litter quality provides a major biogeochemical feedback and control over N-cycling, and mediates ecosystem response to increased atmospheric deposition.

The total amount of NH_4^+ released in decomposition is termed *gross mineralization*. Much of the gross mineralization is quickly immobilized as it is incorporated into microbial biomass. The remainder of potentially plant available NH_4^+ is referred to as *net mineralization*. Additions of readily available carbon (sugars, for example) can greatly increase immobilization rates and reduce net mineralization. NH_4^+ is readily adsorbed onto soil cation exchange sites, hence, it is relatively immobile and not prone to leaching. In high pH soils under dry conditions, NH_4^+ can be volatilized into NH_3 gas and lost to the atmosphere.

NH_4^+ is oxidized to nitrate (NO_3^-) by microbes in the process of nitrification. In coarse-textured soils in California, nitrification rates are relatively high and systems tend to be dominated by NO_3^- as opposed to NH_4^+ . Nitrification rates are generally reduced by low pH, low O_2 , very dry soils or very wet soils, and high litter C:N ratios, but exceptions are known especially under high N-deposition (de Boer and Kowalchuk 2001). NO_3^- is highly soluble in water, and subject to leaching below the root zone. Nitrification also leads to emissions of NO gas, which can be a significant pathway for N-loss back to the atmosphere. Small amounts of N_2O are also produced by nitrification. In most unfertilized ecosystems, N-leaching and NO emissions are minimal, indicating a relatively closed N-cycle. Nitrification provides another critical biogeochemical feedback and control over N-cycling.

Low instantaneous levels of soil NH_4^+ or NO_3^- do not necessarily indicate low N availability over the course of the growing season. Fluxes into and out of these mineral pools integrated over time are a much better indicator of soil N availability. In fact, extended high levels of mineral nitrogen, and leaching of NO_3^- in native ecosystems are symptoms of N-saturation. Similarly, low standing microbial biomass may mask rapid turnover. Measurement of mineralization, nitrification, and microbial dynamics in the field is a complex problem.

Plant roots take up both NO_3^- and NH_4^+ from soil solutions, some species prefer one to the other, but in general, even plants with a nitrogen form preference do better when both are available. Soils adjacent to roots are generally depleted of mineral N and other critical nutrients, indicating high uptake efficiency. NO_3^- is carried by mass flow of soil water to the near-root zone, which increases plant availability; conversely, plants may increase production of fine roots to seek out soil-bound NH_4^+ . Cation and anion exchange processes at the root surface during N-uptake affect local soil chemistry.

Mycorrhizal fungi are symbiotic fungi that associate with plant roots and exchange mineral nutrients for plant-derived carbon. Although standing biomass of mycorrhizae may be low compared with plant biomass, the length of fungal filaments can be far greater than plant roots and contribute to N-uptake. Mycorrhizae are known to improve the nutrition of a majority of the macro- and micronutrients required for plant growth, including NH_4 , NO_3 , and organic N. Mycorrhizae can be sensitive indicators of N status (Egerton-Warburton and Allen 2000), and mutual feedbacks between fungus and plants can mediate ecosystem responses to N-deposition.

Increased N-availability in the soil (during the growing season) leads to either greater plant biomass production or higher tissue N-concentrations, depending on availability of water and other nutrients and the biochemical capabilities of the plants. Increased production and/or N-content leads to an acceleration of parts of the N-cycle (discussed below).

Live plants can emit NH_3 gas back to the atmosphere, especially under high soil N availability in fertilized pastures. Emissions of NH_3 in fertilized systems lead to complications in modeling NH_3 deposition. Plant tissue N (as well as litter) can be volatilized through fire as NO_x , NH_3 , and particulate-N. Herbivory may also have profound effects on rates of N-cycling. Animals feeding on plants can export N from the system, and redistribute it in relatively concentrated and labile forms. Herbivores are very sensitive to plant-N and selective herbivory can change plant species composition.

NO_3^- is denitrified into N_2O and N_2 under anaerobic conditions (wet soils or oxygen poor microsites). Denitrification is an important pathway for N loss in wetlands, surface water, and in groundwater. Denitrification in coarse, well-drained soils is relatively slow, but anaerobic microsites in soil particles provide some opportunities for denitrification. N_2O emissions are of concern as a greenhouse gas (GHG) and as a destroyer of stratospheric ozone. Denitrification and long-term geologic burial are the only pathways that remove N_r from the biosphere as a whole. Conditions that favor complete denitrification to N_2 , with minimal production of N_2O , are the ideal objective of management aimed at removing N_r from ecosystems.

The N-cycle is under strong biotic control, and because of the multiple pathways, processes, and feedbacks that occur in site-specific combinations, it is difficult to generalize about it. Scientific understanding of the N-cycle at many scales is growing, but field measurement of many aspects of the N-cycle and the organisms that drive it continue to challenge ecosystem scientists.

2.2. N-limitations in California Terrestrial Ecosystems

California is recognized worldwide as a biodiversity hotspot, reflecting geographic isolation, strong regional and local climatic gradients, and geologic complexity (Bakker 1984). The mediterranean-type climate of cool wet winters and warm dry summers varies from the wet north to the dry south, from warm lowlands to frigid mountains, and from the maritime coastal zone to more continental inland regions—often over scales of a few kilometers. The complex and often violent geologic history of the state creates diverse edaphic conditions, ranging from shallow infertile serpentine soils and leached sands to deep fertile alluvial soils. California ecosystems span a broad range of physiognomic types, including the world's tallest high biomass evergreen forests, evergreen and deciduous forests, woodlands and shrublands, annual and perennial grasslands, deserts, and localized ecosystems specific to unique edaphic situations. Dramatically different vegetation types are often juxtaposed across abrupt topoclimatic and edaphic gradients, and fires create successional patchiness, creating rich local and regional vegetation mosaics. Aquatic ecosystems are diverse as well, ranging from oligotrophic mountain lakes, eutrophic lakes, seasonal lakes, freshwater and alkaline wetlands, mountain streams, large lowland rivers, and coastal marshes.

According to the Jepson Manual (Hickman 1993), California supports more than 5800 native plant species, of which 1169 are endemic to the California Floristic Province (the strongly mediterranean climate region of the West Coast). There are numerous localized endemic species, subspecies, and varieties that have minuscule ranges corresponding to special edaphic or climatic conditions. Geographic and botanical diversity also have produced a highly diverse fauna, again with many local endemic taxa. Many of these local endemics are listed as rare, threatened, and endangered by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDF&G) under their respective Endangered Species Acts. The California Native Plant Society (CNPS) maintains a list of rare, threatened, and endangered plants as well (CNPS 2003).

Urban and agricultural development pressures directly threaten habitats—few native species survive paving over and plowing under. Biological invasions, both plant and animal, pose one of the greatest threats to California's biodiversity. California ecosystems have been, and continue to be, heavily invaded by non-native plants—more than 1000 alien species have naturalized, and many have extensively and irrevocably altered millions of acres of California. Native grasslands, in particular, have been heavily altered by annual grasses and forbs from Eurasia, but few ecosystems have completely avoided invasions. Changes in plant composition affect animal communities, especially host-specific herbivores.

Water, temperature, and nutrients all can limit ecosystem productivity in California. The overall physiognomy and productivity of mature vegetation is largely determined by long-term site water balance and the effective length of the growing season. The length of the dry season is particularly important. However, given local water and temperature limitations, additions of nitrogen often produce immediate growth responses, indicating some degree of N-limitation. Phosphorous and other mineral

nutrients are generally not limiting in the relatively young soils that dominate California, except in special soil types such as serpentine.

Under the mediterranean climate, seasonal patterns of N-availability, driven by decomposition, N-mineralization, and nitrification, are alternately limited by water and temperature. Most N-cycling occurs in shallow soil layers that contain the majority of organic matter. Soils are dry during the summer, wet with moderate temperatures following the first autumn/winter rainfall, wet but cool in the winter, and warm and wet only in the spring. Decomposition is slow for most of the year, and litter, especially coarse woody debris, tends to accumulate in the absence of fires. Fire is a key process in California ecosystems, and plays a critical role in driving N-deposition impacts (see below, Section 2.6).

Plant uptake and soil-N availability are often out of phase, and California ecosystems may be naturally "leaky," with some seasonal leaching of NO_3^- . N-mineralization and nitrification spike in autumn after the first soil wetting, but root uptake may lag behind until perennials develop new fine roots and annuals establish root systems. A pulse of NO_3^- can be flushed below the root zone or run off into surface water if early rains are sufficient to cause deep infiltration and runoff. Low plant uptake during the cool winter months can lead to NO_3^- leaching if sufficient rainfall occurs. In cold areas, deposited N accumulates in snowpack, with a large flush during melt. Flushes of NO_3^- following fires and other disturbances are important transient responses.

Specific evidence for N-limitations in a range of California terrestrial ecosystems are discussed in Section 2.4.

2.3. N-limitations in California Aquatic Ecosystems

Aquatic systems range from oligotrophic (i.e., nutrient-poor clear waters, such as Lake Tahoe) to mesotrophic to eutrophic (i.e., nutrient-rich waters with limited visibility, such as Clear Lake). Productivity in aquatic systems can be limited either by N or P, and phytoplankton communities are indicative of limiting nutrients. If N is limiting and P is relatively abundant, N-fixing phytoplankton (cyanobacteria) become more dominant. If P is limiting and N is abundant, then other phytoplankton taxa will dominate. If both N and P are abundant, some other nutrient (silica, for example, in the case of diatoms) may limit productivity. Both N and P enrichment can lead to algal blooms that can decrease water quality, and in extreme cases, decomposition of high algal biomass can deplete oxygen.

Many of the thousands of oligotrophic mountain lakes in the Western United States, including those in the Sierra Nevada, are naturally N-limited. NO_3^- is the major N species in montane lakes, and most N arrives as surface and subsurface flow into lakes and N-inputs depend strongly on the surrounding vegetation and soils. Lake Tahoe, an ultimate example of a naturally oligotrophic system, has changed from N-limitation to P limitation in recent decades (Jassby, Reuter et al. 1994).

Flowing waters are less susceptible to N-eutrophication, but can contain high levels of NO_3^- . NO_3^- is a criteria water quality pollutant. Intermittent streams often exhibit a flush of NO_3^- in high pollution areas, and long-term accumulation of N in watersheds can lead to high NO_3^- in baseflow originating from groundwater. Much N runoff in larger rivers in agricultural regions is associated with agricultural fertilization and livestock emissions, but elevated atmospheric deposition can also play a role.

Wetlands are susceptible to changes in structure and function under elevated N, and atmospheric deposition can encourage the spread of nitrophilous species (Morris 1991). Wetlands can act as filters, both capturing N in high productivity vegetation and in sediments, and perhaps more important, by denitrification in saturated soils (Morris 1991). The loss of riverine wetlands and floodplains greatly reduces basin-wide denitrification (Galloway, Aber et al. 2003).

Coastal bays and nearshore waters may also be N-limited—hypoxia and other water quality problems have been attributed to N-runoff on the East Coast and Gulf of Mexico. Extreme water quality problems in coastal California waters have generally been associated with large point sources, such as sewage outfalls and the mouths of urban creeks. However, recent work has indicated that seepage of polluted groundwater can contribute substantial nutrients to coastal waters (Boehm, Shellenbarger et al. 2004).

2.4. Effects of Chronic Deposition on N-cycling

The fate and impact of deposited N into ecosystems is driven by the response of plants and microbes to increased N-availability, and a series of biogeochemical feedbacks (Langran 1999). This section discusses general ecosystem responses to elevated N-deposition. Dry and wet deposition dynamics are complex and will only be briefly mentioned here, and models and algorithms are reviewed by Tonnesen et al. in an accompanying report (Tonnesen and Wang, forthcoming).

Dry deposition is modeled using atmospheric concentrations and deposition velocities. Deposition velocity is determined by aerodynamic, boundary-layer, and surface resistances (Metcalf, Fowler et al. 1998). Aerodynamic resistance is driven by atmospheric turbulence, which is a function of surface roughness and wind velocity. There is greater turbulent transport over rougher surfaces, such as forests, than over smooth surfaces, such as grassland. Boundary layer resistance accounts for gaseous diffusion through the thin still layer of air surrounding all surfaces. Surface resistance accounts for the affinity of each particular gas species to different surfaces and moisture regimes. Of the major atmospheric N_r species, HNO_3 , and NH_3 have the highest deposition velocities, because they are highly soluble in water, including thin films that remain on apparently dry surfaces. NO_2 is relatively insoluble in water and typically has deposition velocities an order of magnitude lower than HNO_3 and NH_3 , and NO hardly dry deposits at all. Extensive reviews of atmospheric chemistry and deposition processes/modeling can be found in Metcalfe, Fowler et al. (1998) and Fowler (2002).

Atmospheric N-deposition enters ecosystems via deposition to plant and soil surfaces and via stomatal uptake into leaf interiors (Metcalf, Fowler et al. 1998; Fowler 2002). Precipitation contains N_r in various oxidized and reduced forms. *Throughfall* (below

canopy wet deposition) includes dry deposition on the surfaces of plant canopies that is washed into soils by precipitation and by fog drip (Collet, Daube, et al. 1990; Fenn, Poth, et al. 2000). Throughfall can also include inorganic and organic N leached from leaves. In California, dry deposition (especially of HNO_3) accumulates over the long summer droughts, and large pulses of accumulated N may be washed into soils with the first rains. Depending on the timing of winter rainfall, similar but smaller spikes of throughfall inputs may occur through the winter. Summer storms can also drive significant throughfall events. The combination of immediate deposition inputs with the initial pulse of mineralization and nitrification as soils are wetted produces a seasonal spike of high mineral N in the autumn. In coarse-textured California upland soils, NH_4^+ inputs—both as NH_3 gas and NH_4^+ particulates—are usually rapidly nitrified. However, the effective differences between reduced and oxidized N species in California are not well known. As mentioned above, NO_3^- leaching may occur following the substantial rainfall events—either summer thunderstorms or winter storms.

Stomatal uptake delivers N directly to the leaf interiors, and stomatal dynamics are essential to deposition models (Fowler 2002). The major deposition pathway for NO_2 is through stomata, as NO_2 is relatively insoluble in water and does not readily deposit to soils and foliage. Nitrogen dioxide is reduced to NH_4^+ in the leaves via nitrite reductase, and NH_4^+ is incorporated into amino acids. Ammonia is also rapidly deposited through stomata, although a high fraction may deposit on wet surfaces and on residual water films. Ammonia input into stomata is directly incorporated as NH_4^+ into amino acids. HNO_3 is also absorbed through stomata, and can also be transported through cuticles into leaf interiors (Marshall and Cadle 1989). Stomatal uptake can provide a substantial fraction of the N requirement of plants, but some plants may have difficulties assimilating NO_2 —the ability of plants to tolerate NO_2 depends on antioxidants, nitrite reductase regulation, and other biochemical processes within leaves. Stomatal uptake of NO may not provide a large source of mineral N, but can affect metabolic processes—direct NO effects are an area of uncertainty (Mansfield 2002). NO levels generally decrease with distance from primary source, as it is rapidly oxidized to NO_2 .

Once atmospheric N_r is deposited into ecosystems, it has cascading effects as it is assimilated, transformed, and recycled by organisms. The literature of N-fertilization in natural and agricultural systems is large. An extensive review of nitrogen addition experiments in arid, semiarid, and subhumid ecosystems indicates that aboveground net primary production (ANPP) is co-limited by N and water (Hooper and Johnson 1999). Nitrogen and water availability are tightly linked through biogeochemical feedbacks, including changes in litter quality and decomposition rates, microbial community dynamics, allocation patterns within plants, species composition, and other processes. The immediate effects of N and water additions are often additive in arid and semi-arid ecosystems.

Plant productivity typically exhibits a parabolic response to nutrient additions—at low levels, additions of nutrients increases growth, peaking at some intermediate level, and declining at higher levels. The typical immediate response to N-fertilization is a growth increase of existing plants, and such growth responses are taken as evidence of N-limitations. The direct uptake of atmospheric N_r also leads to growth increases in some

species. Not all species are capable of large growth increases because of co-limitations from other nutrients or plant life history, architecture, and biochemistry. Plant tissue-N also increases, especially when other nutrients become more limiting; many plants take up available N in excess of demand. Nutrient imbalances can lead to changes in plant allocation, decomposition, herbivory, and other ecosystem processes.

Over longer time scales, increased productivity at the stand level is driven by changes in species composition, as nitrophilous species (adapted to high N conditions) outcompete other species by shading, root competition, selective herbivory, and other mechanisms. Species composition, through differences in foliage quality and phenology, affects N-cycling rates, which further affect species composition and feeds back into N-cycling. Changes in species composition have been extensively documented in Europe and elsewhere under long-term fertilization and N-deposition, and will be discussed below. Species composition changes also involve non-native invasive species, many of which respond strongly to N-fertilization. At ever higher levels of N-availability, productivity may decline as nutrient imbalances disrupt ecosystem processes

N-deposition can also lead to soil acidification and loss of base cations (e.g., calcium, magnesium, and potassium). Nitric acid (HNO_3) is a strong acid and directly contributes H^+ when it dissociates. Ammonia and NH_4^+ contribute 4 H^+ ions during nitrification, and acidification under high NH_3 deposition is well documented in Europe. Most California soils have high base cation saturation, and appear relatively resilient to acidification, but long-term deposition can reduce base cation saturation and increase acidity.

2.4.1. Nitrogen saturation

N-deposition is a cumulative process, eventually leading to N-saturation. Increased N inputs accelerate N-cycling, as greater litter fall with lower C:N ratios and increase decomposition and mineralization rates, which then stimulate nitrification and production of NO_3^- . Eventually, biotic demand for N (plant uptake and microbial immobilization) is exceeded by supply and N-saturation commences, representing a breakdown of biotic controls over N-cycling and exports.

Nitrogen saturation occurs in several stages in xeric western forests (Figure 2). Stage 0 is the original condition of low deposition, with low NO emissions and NO_3^- leaching—a high fraction of net nitrification is taken up by plants and microbes, and effectively recycled within the system. In Stage 1, incremental N-deposition leads to higher N-availability via increased nitrification and stomatal uptake by plants, leading to increases in net primary productivity (NPP). At saturation (Stage 2), NO emissions and NO_3^- leaching increase as plant uptake and microbial immobilization fall behind nitrification. Decline (Stage 3) is usually the result of multiple stress interactions, including ozone stress, susceptibility to bark beetles, and reduced fine-root biomass (Fenn, Baron, et al. 2003). Nutrient imbalances lead to stress and mortality, decreasing biotic N demand, but also increasing dead biomass inputs. N-saturated watersheds in Southern California have some of the highest levels of NO production and NO_3^- leaching recorded worldwide from non-agricultural ecosystems.

Excess nitrate leaching into surface and groundwater is a major symptom of N-saturation, and poses risks to water quality. A full discussion of water quality impacts is beyond the scope of this report

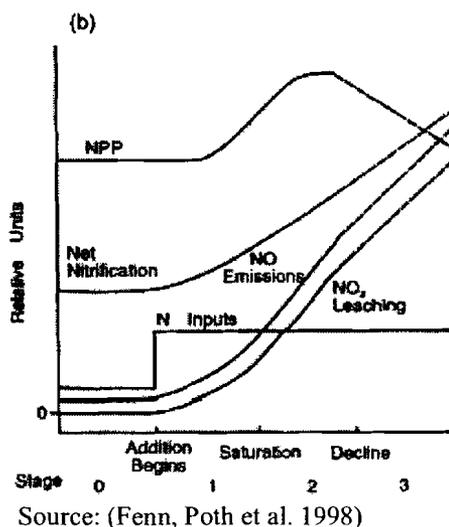


Figure 2. Stages of N-saturation in western xeric forests

The cumulative nature of N-deposition has led to the concept of *critical loads*, defined as “a quantitative estimate of an exposure to N as NH_x and NO_y below which empirical detectable changes in ecosystem structure and function do not occur according to present knowledge.” (Bull 1992; Bull and Sutton 1998) Applicability of critical loads to California ecosystems will be discussed below, but the rigorous identification of critical loads for specific ecosystems is beyond the scope of this report. Critical loads to sensitive European grasslands range as low as $5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and critical loads for oligotrophic lakes may be even lower (Fenn, Baron et al. 2003). Throughout the comparative discussion of N-deposition exposure, a standard benchmark of $5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ is used. This benchmark does not imply that $5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ is the critical load for negative impacts for all ecosystems—some may be more sensitive and some may be less sensitive. As better information becomes available, this benchmark number may be modified for particular ecosystems; for this reason, data are graphically presented so that any benchmark can be used.

It is important to realize that the widespread increased atmospheric deposition of oxidized and reduced nitrogen is an unprecedented development—background levels across much of the world are estimated at $0.25\text{-}1 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$. The cumulative and insidious nature of N-deposition effects on ecosystems may be realized only after decades of elevated N inputs, and critical cumulative loads are poorly understood for most California ecosystems.

2.5. Mechanisms by Which N-deposition Can Lead to Impacts on Sensitive Species

2.5.1. Direct toxicity

Potential cases of direct toxicity of N compounds have been reported specifically in California. High ambient levels of HNO₃ in the Los Angeles Basin can approach levels that directly damage conifer foliage, and perhaps other species. High soil N may also be directly toxic—100% of *Artemisia californica* (sagebrush) seedlings died when grown in soils with NO₃⁻ concentrations similar to field concentrations of high-deposition areas near Riverside. However, these experiments are based on high exposure under artificial conditions. There is some evidence that NO may have direct inhibitory effects on plants at high concentrations (Mansfield 2002). Peroxyacetyl nitrate (PAN) may be toxic as well (Grosjeans and Bytnerowicz 1993).

2.5.2. Changes in species composition among native plants

In Europe, a large body of work has linked N-deposition to changes and losses of biodiversity in bogs, grasslands, heathlands, and forest understory (Bobbink, Hornung et al. 1998; Bobbink and Larners 2002; Stevens, Dise et al. 2004). Increases in nitrophilous grasses, primarily perennials but also some annuals, are a common response in species-rich grasslands on acid soils and calcareous soils, and in heathlands. Acidification from large amounts of NH₃ deposition also contributes to floral changes, but species losses in acid grasslands in the UK are proportional to N-deposition levels and only weakly associated with acidity. Heathlands convert to grasslands when *Calluna vulgaris* (heather) canopies open from herbivory, stress, and disturbance, and nitrophilous grasses quickly establish and dominate. Comprehensive reviews of N-deposition impacts on European ecosystems can be found in several edited compilations (Langran 1999; Bell and Treshow 2002).

Changes in native species composition in California habitats directly attributable to N-deposition have not been explicitly identified, except in the case of invasive species as described below. Air pollution can affect species composition in native dominated habitats—ozone induced mortality in ponderosa and Jeffrey pines has led to increases in ozone-resistant species such as incense cedar and white fir in Southern California forests, but the interactions with N-deposition remain an active research arena (Fenn, Poth et al. 2003).

2.5.3. Enhancement of invasive species

Invasive plant species have severely altered numerous California ecosystems. The major documented mechanism of N-deposition impacts on sensitive species is the enhancement of invasions by nonnative species, especially annual grasses. Historical annual grass invasions into richer soils, prior to widespread N-deposition, have restricted many native grassland species to patches of thin soil, or onto naturally nutrient-poor soils such as serpentine. Many, if not most, non-native annual grass species respond strongly to N additions by increasing growth and seed production (e.g. Jones and Evans 1960; Jones 1963; Huenneke, Hamburg, et al. 1990; Yoshida and Allen

2004). Invasive grasses, both annual and perennial, have been documented to alter biodiversity and ecosystem function across the world (D'Antonio and Vitousek 1992). They are highly effective in depleting shallow soil moisture, and provide continuous fine fuels that accelerate fire cycles. Dense buildup of thatch smothers short-statured native plants and suppresses seedling recruitment. Once annual grasses replace shrubs, N-cycling rates increase and continue to favor grasses over shrubs.

Increased fire frequency, driven by annual grass invasions, is hypothesized to drive type conversions in many ecosystems along a biomass gradient. Low biomass shrublands are most sensitive, but chaparral and forests may be vulnerable over longer time-scales (Fenn, Baron et al. 2003). There is some current controversy over the exact role of N-deposition in type conversions of some California shrublands (Keeley, Keeley, and Frothingham 2005), and like any complex ecological problem there may be multiple forcing factors. But, the strong positive response of annual grasses to N-fertilization clearly implicates N-deposition in many of the cases discussed below.

Invasions of many other nonnative weeds are likely enhanced by N-deposition. These plants have high relative growth rates, are effective competitors for water, nutrients, and light, have few herbivores, and respond strongly to N-availability.

2.6. Specific California Ecosystems Known to Be Sensitive

The following accounts are brief summations of documented effects of N-deposition on specific California ecosystems. For a fuller review and extensive literature citations, see (Fenn, Baron et al. 2003).

2.6.1. Conifer forests

Mixed conifer forests of many different sub-types occur across large swaths of California. N-deposition in conifer forests in Southern California leads to high nitrification rates, leaching of NO_3^- into ground and surface waters, and emissions of NO. Impacts of ozone on mixed conifer forests have been extensively documented, and include reductions in photosynthesis and productivity. The combination of high ozone and high N-deposition reduces needle retention, disrupts root growth, increases foliage N, weakens trees, and can leave forests vulnerable to insects. Biomass and litter accumulation increases fuel loads and eventual fire intensity.

2.6.2. Evergreen chaparral

Chaparral ecosystems in the San Gabriel Mountains and Southern Sierra Nevada have experienced N-saturation, as evidenced by high NO_3^- leaching, accumulation of soil NO_3 , and high emissions of NO.

In comparison to coastal sage scrub or even Mohave shrublands, chaparral ecosystems are nitrogen-rich. Many of the dominant species are nitrogen fixers, so increases in N-availability is not likely to change the ecosystem function or processes.

Changes in species composition in evergreen chaparral have not been documented. The closed canopy of chaparral can effectively keep out annual grasses in the absence of fires. Following fires, a fire-following herbaceous flora can dominate for several years, until resprouting shrubs and seedling recruitment close the canopy. Post-fire seeding with *Lolium multiflorum* (Italian ryegrass, an annual) and *Lolium perenne* (Perennial ryegrass) for erosion control can suppress the herbaceous phase. *Lolium* responds strongly to N-deposition (see Section 2.6.5). Increased fire frequency can reduce shrub diversity, and eventually eliminate shrubs.

2.6.3. Coastal sage scrub

Coastal sage scrub (CSS) is a primarily deciduous shrubland that occupies relatively dry sites along the coast and further inland. Typical species include *Artemisia californica*, *Eriogonum* sp., and *Salvia* sp. The relative dominance of species and degree of canopy closure changes along geographic gradients, and these changes are reflected in sub-types of sage scrub—Diegan, Riversidian, Venturan, Central (Lucian), and Northern (Franciscan). Coastal sage scrub in southern California supports a wealth of sensitive species that are at risk from habitat destruction by urban development.

Mature coastal sage has few nitrogen fixers in the mature vegetation stands, thus the ecological processes and functions tend to be more sensitive to changes in nitrogen cycling. Furthermore, in CSS during most years, evapotranspiration exceeds rainfall and no runoff occurs—so any nitrogen that deposits in the ecosystem stays in the ecosystem. Leaching losses may occur only under exceptionally high rainfall events, so soil nitrate tends to accumulate through time.

In high N-deposition areas near Riverside (20–35 kg-N ha⁻¹ yr⁻¹), CSS provides a well-studied case of large-scale annual grass invasion converting shrublands to grasslands. N-deposition has been implicated as a major (but not the only) driver of these invasions. (Fenn, Baron et al. 2003). Major invasive grasses include *Bromus madritensis rubens*, *Avena* sp., and other *Bromus* sp. Dense annual grass can eliminate small native forbs, suppress shrub recruitment, and provide fine continuous fuels that lead to stand-replacing fires. Two successive burns can effectively eliminate shrubs. Mycorrhizal fungal diversity drops with increasing N-deposition (Egerton-Warburton and Allen 2000). Qualitative observations of annual grass invasions in CSS east of San Diego (B. Toone, San Diego Zoological Society, pers. comm. July 2004) indicate that N deposition may be having similar effects there.

The change from shrublands to annual grassland increases the rate of N-cycling in the ecosystem. In annual grasslands, biomass turnover is faster and litter C:N ratio is lower. Shrubs accumulate woody biomass that decomposes slowly, and resorption of leaf N (and other nutrients) reduces litter quality.

Management of annual grasses in CSS poses many difficulties. Restoration to shrublands may be difficult and expensive. Changes in the mycorrhizal community may favor

grasses over reestablishment of shrubs. Grazing by cattle, effective for controlling annual grasses in serpentine grassland and vernal pools (see below), may threaten the uninvaded lenses of clay soils that still support cryptobiotic crusts and native forbs. Occasional leaching/flushing events may provide opportunities for shrub re-establishment.

2.6.4. Desert scrub

California desert scrubs vary greatly across elevation climatic gradients, and are characterized by widely spaced shrubs and showy displays of annual wildflowers in wet years. In the Mojave Desert, N-deposition can lead to invasions by annual grasses, including *Bromus madritensis rubens* (red brome), and *Schismus barbatus* (Mediterranean annual split grass) (Brooks 2003). Wet years greatly intensify the grass invasions, and fine continuous fuel loads encourage extensive stand-replacing fires that were not possible prior to the grass invasions. In cooler deserts, *Bromus tectorum* (cheatgrass) has invaded large tracts with similar results, although invasions have occurred in the absence of significant N-additions (D'Antonio and Vitousek 1992).

2.6.5. Bay Area serpentine grassland

In the San Francisco Bay area, serpentine soils support native grasslands with high diversity of annual and perennial wildflowers, and perennial bunchgrasses (right side of fence in Figure 3). Under N-deposition, ungrazed serpentine grasslands (left side of fence in the Figure 3) are invaded by annual grasses primarily *Lolium multiflorum* (Italian ryegrass), *Hordeum murinum leporinum* (wild barley), *Bromus hordaceus* (soft chess), *Bromus madritensis* (red brome), and *Avena* sp. (wild oats) (Weiss 1999). *Lolium* growth strongly responds to N-fertilization and additional water, and rapidly absorbs and assimilates atmospheric NH_3 through stomata (Sommer and Jensen 1991). Nitrogen dioxide may also produce similar responses (Fowler 2002; Mansfield 2002). Concentrations of HNO_3 in south San Jose approach those in polluted parts of the Los Angeles Basin (S.B. Weiss unpublished data). N-deposition effects have been observed along regional pollution gradients and local gradients adjacent to a heavily traveled freeway.

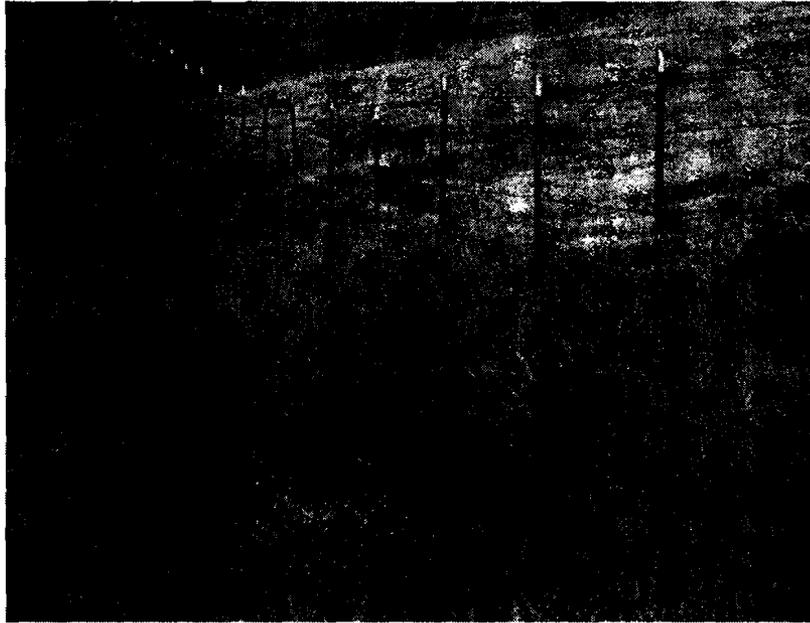


Figure 3. San Francisco Bay Area grasslands in serpentine soils. The area on the left is ungrazed and dominated by non-native grasses. The area on the right is grazed and dominated by native species

Losses of plant diversity are accelerated by accumulation of grass thatch, which smothers small annual forbs. Moderate cattle grazing maintains high plant diversity in these grasslands, because cattle selectively graze N-rich *Lolium*, remove N and biomass from the system, prevent thatch buildup, and provide bare mineral soil for annual forb germination. Cattle also redistribute N and accelerate local N-cycling rates.

Bay Area serpentine grasslands are a biodiversity hotspot, supporting numerous threatened and endangered species, including the Bay Checkerspot butterfly, *Euphydryas editha bayensis* (USFWS 1998). Population extinctions of the butterfly follow grass invasions, because the larval host plant, *Plantago erecta* (dwarf plantain, a short annual forb) is crowded out by grass invasions.

The N-deposition threat to protected species in serpentine grasslands prompted precedent-setting mitigation for power plant emissions from the Metcalf Energy Center in San Jose (and other power plant projects, see Table 1), stimulated specific mitigation for highway projects and industrial developments, and drove the initiation of a Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) for Santa Clara County.

2.6.6. Mountain lakes

Primary productivity in Lake Tahoe has increased greatly over the last decades, and has changed from N-limitation to P-limitation (Jassby, Reuter et al. 1994). Atmospheric deposition is a primary source of elevated N in Lake Tahoe, contributing more than half of the N-loading, but the overall N-budget of the Tahoe Basin is still uncertain. Similar

changes in phytoplankton communities—a shift from oligotrophic to more mesotrophic species—have been documented in the Southern Sierra Nevada (Fenn, Poth et al. 2003).

2.6.7. Lichen communities

Lichens are common and diverse in many ecosystems, and are sensitive indicators of various air pollutants. Nitrogen-sensitive lichen species have disappeared from high N-deposition areas—more than 50% of the native lichens in parts of the Los Angeles Basin have disappeared. Evidence of affected lichen communities extends across much of the state (Fenn, Baron et al. 2003).

2.7. Other California Ecosystems that May Be Sensitive

2.7.1. Vernal pools

Vernal pools are seasonal wetlands that contain water in the winter rainy season and dry over the summer drought. An impervious subsoil layer (hardpan or claypan) prevents rapid drainage. Vernal pools are characterized by a pronounced mound to pool bottom gradient, where mounds support upland grassland, with progressively longer flooding periods as one descends to the pool bottom. Pool bottoms and intermediate zones are characterized by a unique flora and fauna adapted to seasonal flooding. Many rare, threatened, and endangered species—both plants and animals—are found in vernal pools.

Annual grass invasions in vernal pools have been documented in the Sacramento Valley (Barry 1998; Gerhardt and Collinge 2003). Recent work in the Consumnes Reserve (Marty 2005) has identified annual grasses as a major threat to ungrazed vernal pools (Figure 4). When annual grasses are allowed to grow ungrazed, they evaporate more water from the mound areas, reducing inundation periods in the pools and allowing grasses to further invade deeper portions of the pools. These grass invasions, which occur over 2–3 years, lead to a direct loss of biodiversity of native vernal pool plants through competition and thatch buildup, and the shorter inundation periods lead to losses of invertebrates such as endangered fairy shrimp, and tiger salamander and red-legged frogs. Annual grass invasions, especially by *Lolium multiflorum*, have been noted in vernal pool systems in Sonoma County, with substantial losses of native biodiversity including listed plant species (D. Glusenkamp, Audubon Canyon Ranch, pers. comm.).

Given the well-documented responses of annual grasses to N-additions, and impacts in other California ecosystems, the intensity of annual grass invasions in vernal pools is likely increased by N-deposition and vernal pools can be considered a sensitive ecosystem.

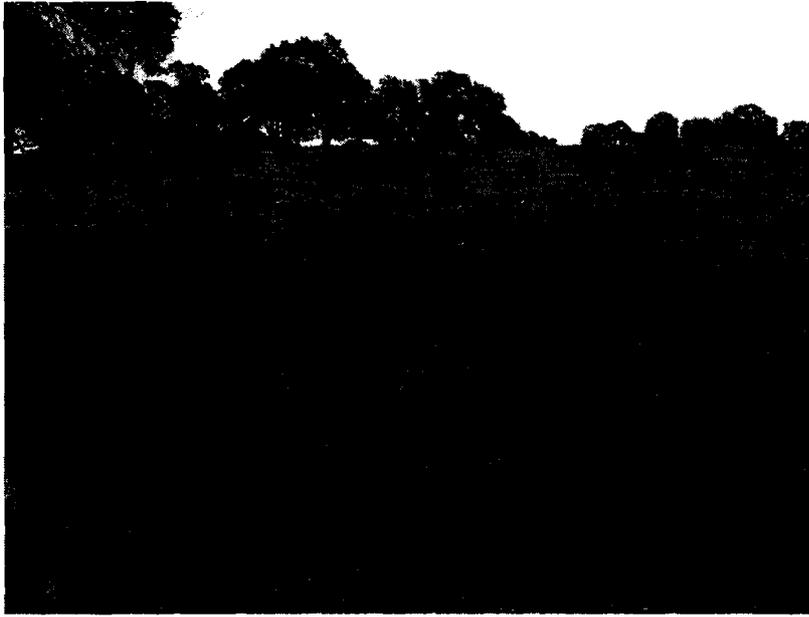


Figure 4. Grassland invasion at a vernal pool

2.7.2. Sand dunes

Annual grass invasions in the Antioch Dunes threaten the endemic flora and fauna of this inland dune system (Steve Edwards, East Bay Regional Park District, pers. comm.). Coastal dune systems are in relatively clean coastal air, but inland sand dune systems may be at risk. Annual grass invasions have been noted in eolian sands in the Arena Plains San Joaquin Valley, where cattle grazing has been a key management practice (Silviera 2000).

2.7.3. California “annual” grassland

Although many California grasslands are dominated by invasive annual grasses and forbs, they can still support local concentrations of native wildflowers and bunchgrasses. Increased annual grass growth stimulated by N-deposition may further restrict native forbs to nutrient-poor thin soils around rock outcrops and on steep slopes.

Coastal grasslands are susceptible to invasion by the native shrub *Baccharis pilularis* (coyote brush) in the absence of fire or grazing. Such invasions occur in clean coastal areas, so N-deposition is likely not the primary driving factor, but the potential contribution of N-deposition to this process is not known.

2.7.4. Oak woodlands

Oak woodlands and savannahs have understory grasslands—formerly dominated by native perennial grasses and annual and perennial forbs, but now dominated by introduced annual grasses—that may be affected by increased annual grass growth as described above. Annual grasses are effective competitors for soil moisture in spring,

and have been implicated in suppressing oak seedling recruitment. Grazing removal from oak woodlands in the East Bay regional Park District has led to intensified invasions of annual grasses (S. Edwards. EBRP, pers. comm.), but grazing can also directly affect oak recruitment, and remains a contentious issue in resource management.

2.7.5. Alpine communities

In alpine areas in Colorado, N-deposition has been linked to changes in species composition, with an increase in nitrophilous species and changes in N-cycling. N-inputs may be particularly high and effects substantial in wet meadows where windblown snow accumulates and water limitations are few. Water limitations in rocky fell field communities may restrict growth responses to increased N-deposition. No comparable changes have been explicitly documented in California.

2.7.6. Serpentine soils (other than Bay Area grasslands)

Serpentine soils provide numerous limitations to plant growth, including low calcium, phosphorus, molybdenum, and nitrogen, and high magnesium, nickel, chromium, and other heavy metals. Soils tend to be thin and rocky. The unique and harsh growing conditions on serpentine soils, combined with their island-like distribution have led to the evolution of many serpentine endemic plants. Serpentine soils also provide a refuge for many species crowded off richer soils by invasive species. Serpentine communities range from stunted conifer forests, chaparral, grasslands, and near total barrens. N-deposition may promote annual grass invasions in serpentine soils. Reports of non-native grasses invading serpentine habitats have been accumulating (Harrison, Inouye et al. 2003). In some cases it appears that some grass species are becoming better adapted to serpentine, but links to N-deposition have not been made explicit. Other serpentine sites where grass invasions have been noted include the Red Hills in Tuolumne County (J.B. Norton, UC Cooperative Extension, pers. comm.).

2.7.7. Alkali sinks

Low-lying areas in deserts and semi deserts accumulate salts and provide habitat for a variety of halophytes. Drier upland soils may be dominated by annual grassland. Dense grass growth and thatch are present in places such as the Springtown Sink near Livermore, covering all but the most saline soils (Figure 5). The potential for N-deposition effects in these habitats has not been explicitly addressed, but alterations similar to those in vernal pools may be expected.

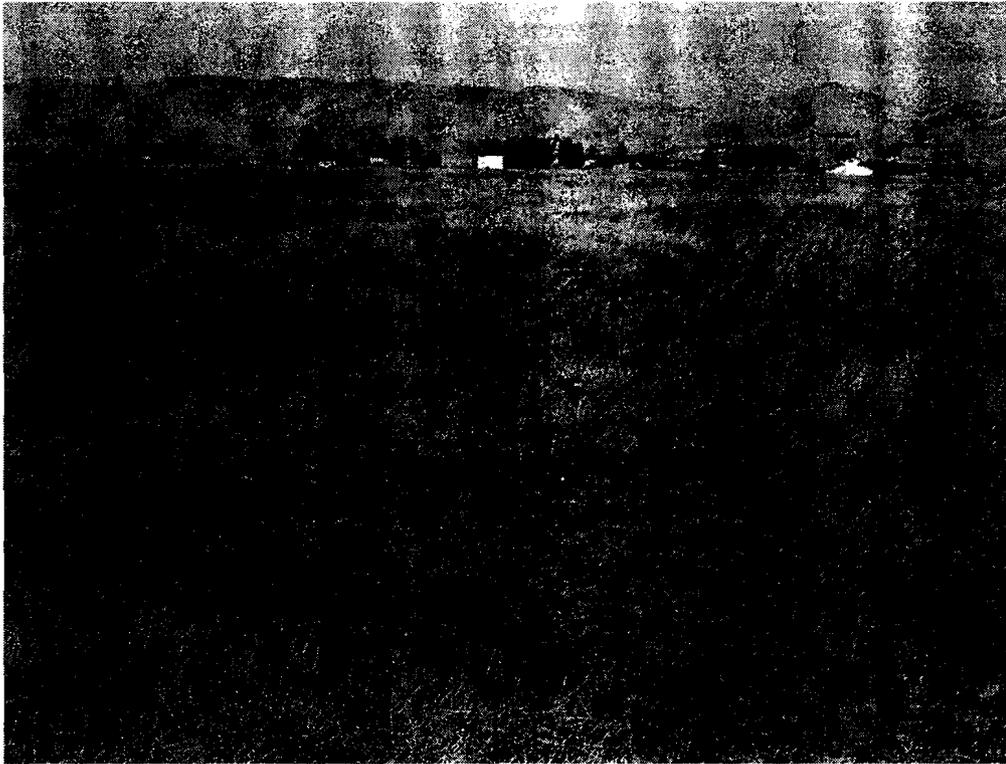


Figure 5. Dense grass growth and thatch in alkali sink near Livermore, California

2.7.8. Salt marshes

Salt marsh productivity is limited by N (Morris 1991). Salt marshes export organic N to adjacent coastal waters, but are also major sites for denitrification. Many salt marshes are locally subjected to elevated N in sewage effluent. The direct impacts of atmospheric N-deposition on California salt marshes have not been assessed. The potential for atmospheric N-deposition to enhance invasion rates by non-native *Spartina* (salt grass) around San Francisco Bay is unknown.

2.7.9. Freshwater marshes

Nitrogen can be limiting to productivity in freshwater marshes (Morris 1991), but the role of atmospheric N-deposition in California freshwater marshes is not known at present.

2.7.10. Other edaphic oddities

California has pockets of unusual soils that support unique ecosystems because of harsh growing conditions. Ione clay is a unique ancient lateritic soil in the foothills of the central Sierra Nevada, supporting several local endemic taxa. Ione clays are heavily leached and very acidic. Impacts of N-deposition are unknown, but annual grasses are present among the endemic shrubs (see Figure 6). Limestone outcrops in the San Bernardino Mountains support a cluster of rare species, as do shallow infertile "pebble-

plains" at higher elevations. Gabbro soils in the Sierra foothills also support a cluster of rare species, but no documentation of annual grass invasion or N-deposition impacts has been reported.

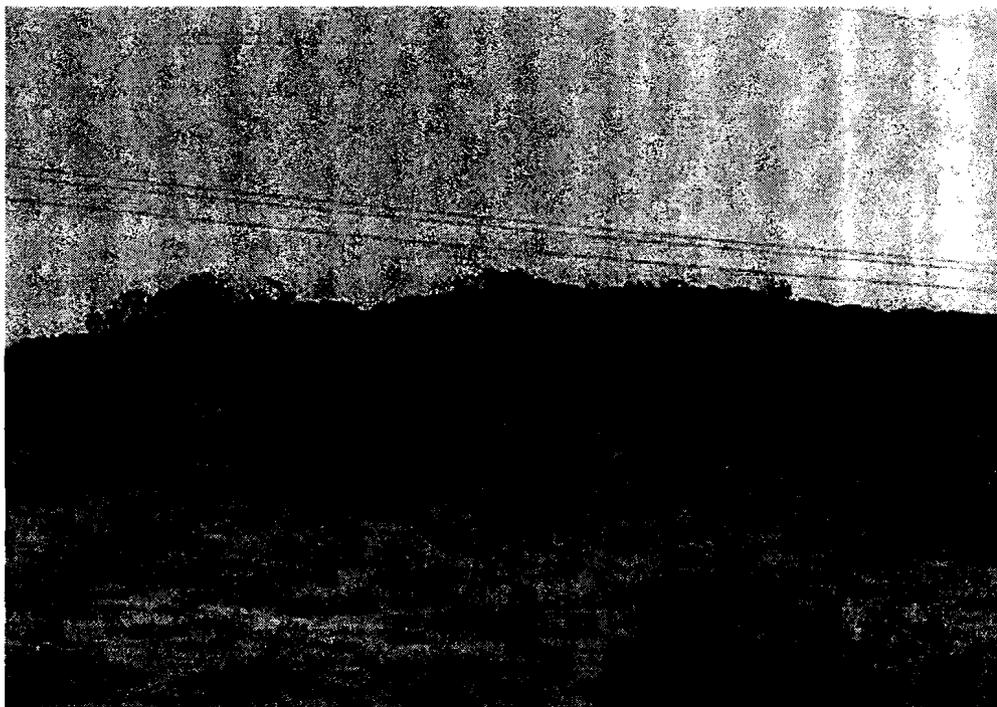


Figure 6. Grasses among endemic shrubs (*Arctostaphylos myrtifolia*) in the lone formation

2.7.11. Surface waters

The leaching of nitrate from N-saturated ecosystems contributes to water quality problems downstream. While nitrate pollution of groundwater and release to surface waters is widely recognized in agricultural areas, there may be atmospheric deposition inputs in other areas, especially in mountain watersheds in the Los Angeles Basin and other high pollution zones. The effects of large nitrate pulses into coastal waters may contribute to near-shore pollution episodes.

3.0 Distribution of N-deposition in California and Ecosystem Exposure

3.1. Distribution of N-deposition at 36 km

The 36 x 36 km CMAQ map of total annual N-deposition identifies levels of exposure across California (Figure 7). Hill-shaded topography and county boundaries are shown to facilitate geographic location. The map is repeated without the topography in following sections. It is extremely important to note that the 36 km scale precludes highly site-specific assessment, and provides a screening tool appropriate to regional-scale analyses. Sharp coastal gradients, in particular, are only approximated at best, and local hotspots within grid squares cannot be resolved. Individual circumstances where greater resolution is needed for assessment accuracy will be identified, but fine-scale analysis will require the completed 4 x 4 km map currently being produced by the UCR group (forthcoming).

Figure 8 presents the overall distribution of N-deposition across California as a cumulative distribution function (CDF). In this presentation format, the proportion of total area below (or above) any selected N-deposition level can be read directly from the graph, and converted to absolute area (in hectares) by multiplying by the total area. For example, approximately 75% of the state (~30,000,000 ha) receives < 5 kg-N ha⁻¹ yr⁻¹, or conversely, 25% (or ~10,000,000 ha) receives more. Similarly, approximately 4% (or ~1,600,000 ha) receives > 10 kg-N ha⁻¹ yr⁻¹. This graph format will be consistently used for assessing exposure of specific vegetation types from the FRAP map, because it allows the determination for any chosen threshold.

Throughout the discussion of N-deposition exposure, a benchmark of 5 kg-N ha⁻¹ yr⁻¹ will be used for comparative purposes. If an ecosystem is exposed to substantial areas >10 kg-N ha⁻¹ yr⁻¹, that is also noted. Once again, this benchmark does not imply that 5 kg-N ha⁻¹ yr⁻¹ is the critical load for negative impacts for all ecosystems—the CDF graphs are designed to allow for consideration of all potential thresholds for impacts as they are identified.

The obvious hotspot for N-deposition is the South Coast Air Basin (SoCAB), with a maximum deposition of 21 kg-N ha⁻¹ yr⁻¹ in the Central Los Angeles Basin, and surrounding cells of 13–16 kg-N ha⁻¹ yr⁻¹, dropping off to 8–10 kg-N ha⁻¹ yr⁻¹ further east and north. Deposition in the Mojave Desert ranges from 6–9 kg-N ha⁻¹ yr⁻¹ in the west, and decreases to 3–4 kg-N ha⁻¹ yr⁻¹ in the east.

In the San Diego Air Basin (SDAB), maximum values are 8–9 kg-N ha⁻¹ yr⁻¹, just east of San Diego. The coastal areas receive 1–2 kg-N ha⁻¹ yr⁻¹. The lightly developed Camp Pendleton gap in Northern San Diego County (5 kg-N ha⁻¹ yr⁻¹) is barely resolved at this scale. Deserts in eastern San Diego County receive 6 kg-N ha⁻¹ yr⁻¹.

In the San Francisco Bay Area, the maximum deposition is 8–9 kg-N ha⁻¹ yr⁻¹. The coastal grid squares such as the San Mateo County Coast have low deposition (1 kg-N ha⁻¹ yr⁻¹), and inland areas in the East and South Bay receive 6 kg-N ha⁻¹ yr⁻¹.

The deposition hotspot in the San Joaquin Valley is near Modesto (13–14 kg-N ha⁻¹ yr⁻¹). The east side of the San Joaquin Valley and lower Sierra foothills receive from 5–9 kg-N

ha⁻¹ yr⁻¹. The west side of the Valley and adjacent slopes of the Inner Coast Ranges receive 3–4 kg-N ha⁻¹ yr⁻¹.

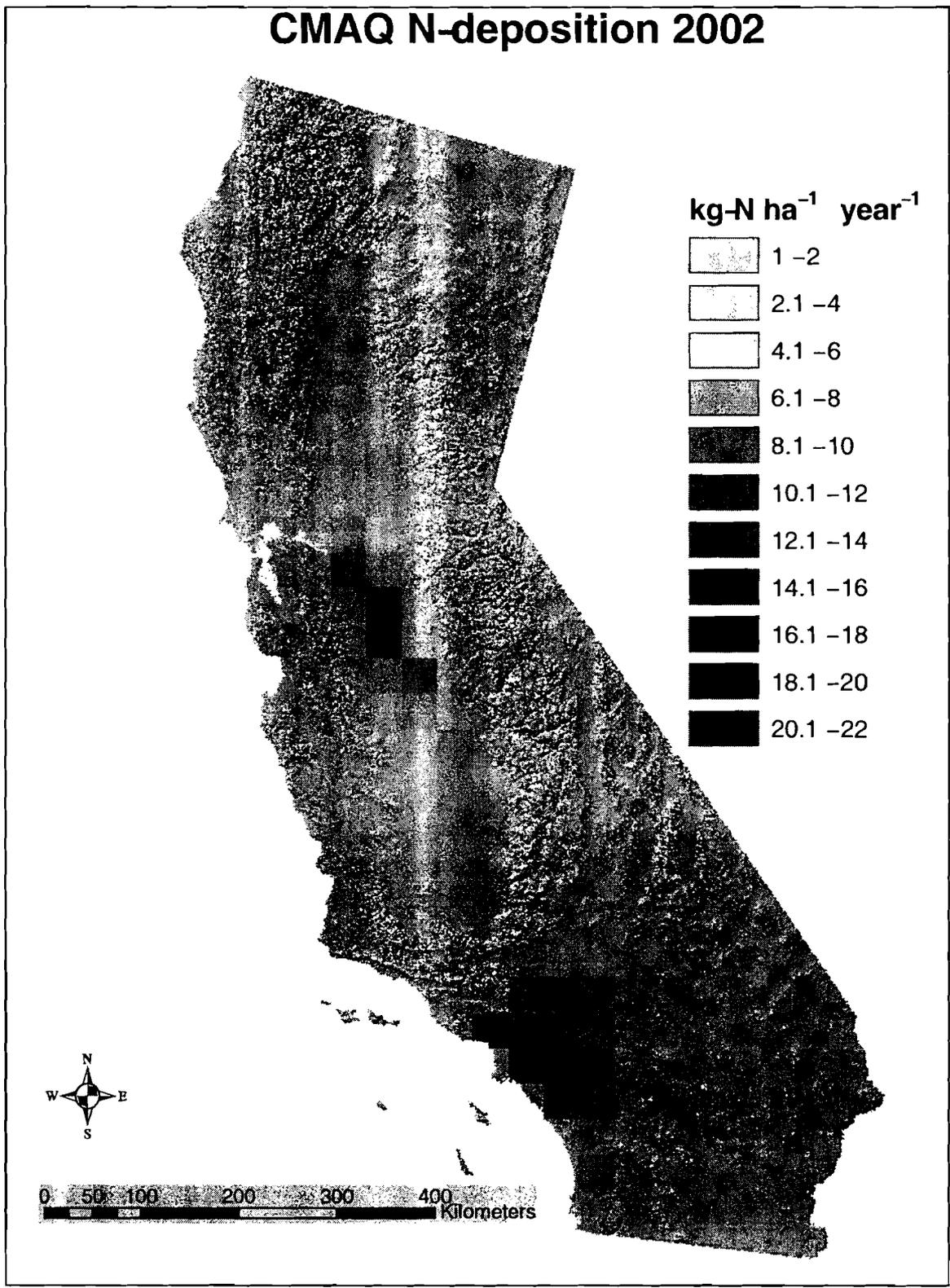


Figure 7. CMAQ 36 km N-deposition

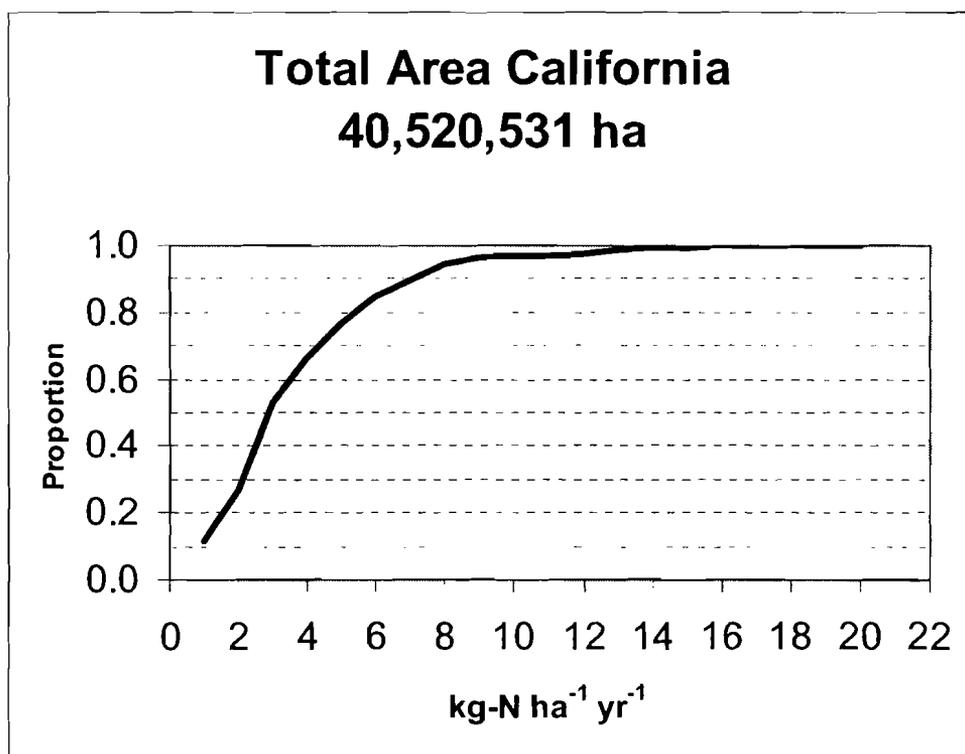


Figure 8. Statewide N-deposition proportion (CDF format)

Maximum values in the Sacramento Valley are 6–8 kg-N ha⁻¹ yr⁻¹ at the southern end and near Sacramento itself. The Northern Sacramento Valley receives 5–6 kg-N ha⁻¹ yr⁻¹ along the eastern side, and 3 kg-N ha⁻¹ yr⁻¹ on the western side.

Coastal areas are generally quite clean. The North Coast has a small area of 4 kg-N ha⁻¹ yr⁻¹ near Eureka. The Central Coast has two hotspots of 5 kg-N ha⁻¹ yr⁻¹ near Santa Maria and Monterey, and Ventura County receives 6 kg-N ha⁻¹ yr⁻¹.

The Sierra Nevada exhibits a strong gradient away from the Central Valley, with deposition ranging from 4–5 kg-N ha⁻¹ yr⁻¹ at the lower elevations to 1–2 kg-N ha⁻¹ yr⁻¹ at the crest. The Eastside has low deposition, similar to the crest. The highest deposition in the Sierra Nevada is in the southern Sierra.

3.2. Ecosystem (Vegetation Type) Exposure

The overlay of the 36 x 36 km CMAQ model with the FRAP map (Figure 9) allows the broad-scale exposure of each vegetation type to N-deposition to be assessed. The complex map does not lend itself to detailed examination at such a small map scale, but is presented to illustrate the complexity of vegetation types in the state. Figure 10 presents the exposure levels to 48 FRAP vegetation types as cumulative distribution functions, as in Figure 8. The CDF graphs are grouped (approximately) by vegetation structure. Appendix A presents maps of the 48 FRAP vegetation types overlaid with the CMAQ 36 km deposition, in the same order as in Figure 10.

FRAP VEGETATION



- Whname**
- █ Agriculture
 - █ Alkali Desert Scrub
 - █ Alpine-Dwarf Shrub
 - █ Annual Grassland
 - █ Aspen
 - █ Barren
 - █ Bitterbrush
 - █ Blue Oak Woodland
 - █ Blue Oak-Foothill Pine
 - █ Chamise-Redshank Chaparral
 - █ Closed-Cone Pine-Cypripis
 - █ Coastal Oak Woodland
 - █ Coastal Scrub
 - █ Desert Riparian
 - █ Desert Scrub
 - █ Desert Succulent Shrub
 - █ Desert Wash
 - █ Douglas-Fir
 - █ Eastside Pine
 - █ Eucalyptus
 - █ Eucalyptus
 - █ Freshwater Emergent Wetland
 - █ Jeffrey Pine
 - █ Joshua Tree
 - █ Juniper
 - █ Klamath Mixed Conifer
 - █ Lacustrine
 - █ Lodgepole Pine
 - █ Low Sage
 - █ Manne
 - █ Mixed Chaparral
 - █ Montane Chaparral
 - █ Montane Hardwood
 - █ Montane Hardwood-Conifer
 - █ Montane Riparian
 - █ Palm Oasis
 - █ Pasture
 - █ Perennial Grassland
 - █ Pinyon-Juniper
 - █ Ponderosa Pine
 - █ Red Fir
 - █ Redwood
 - █ Riverine
 - █ Sagebrush
 - █ Saline Emergent Wetland
 - █ Serran Mixed Conifer
 - █ Subalpine Conifer
 - █ Unknown Conifer Type
 - █ Unknown Shrub Type
 - █ Urban
 - █ Valley Foothill Riparian
 - █ Valley Oak Woodland
 - █ Water
 - █ Wet Meadow
 - █ White Fir



0 55 110 220 330 440 Kilometers

Figure 9. FRAP vegetation

3.2.1. Coastal sage scrub

Approximately 50% of CSS (350,000 ha) is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$. CSS is highly exposed to N-deposition in Southern California—the majority of the $\sim 140,000$ ha exposed to $> 8 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ are near Riverside and San Diego. CSS on the central and north coasts is generally exposed to relatively low levels, but there are some hotspots around Santa Maria, Monterey, and the San Francisco Bay Area.

3.2.2. Annual grassland

Annual grassland covers more than 4,300,000 ha of lowland California. About 30% of the annual grassland receives $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$. The majority of this grassland is on the east side of the Central Valley. These grasslands also support many vernal pools.

3.2.3. Wet meadows

Wet meadows are scattered across the state, and $< 5\%$ (~ 5000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$. These limited hotspots are in the Central Valley and Peninsular Ranges. Meadows in the High Sierra receive low N-deposition.

3.2.4. Perennial grasslands

Perennial grasslands are mapped mostly in San Diego County (especially the Camp Pendleton area), which may reflect a bias in the FRAP map. 90% ($\sim 23,000$ ha) of mapped perennial grasslands are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.5. Agriculture

Agriculture covers $> 4,500,000$ ha of land, and is a major source of reactive N, especially NH_3 , in the atmosphere. 50% of agricultural land receives $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and 5% (225,000 ha) receives a “fertilizer subsidy” of $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.6. Urban

Urban areas are the other major source of reactive N, producing NO_x from combustion and vehicles, and NH_3 from catalytic converters on vehicles. Deposition is naturally quite high within and near to urban sources, and 25% of the urban surface area receives $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.7. Saline emergent wetland (salt and brackish marsh)

The largest remaining areas of salt marsh in California surround the San Francisco Estuary. 30% (~ 8500 ha) receive $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.8. Freshwater emergent wetlands

Freshwater emergent wetlands include tule marshes, cattail marshes (both natural and managed) and are most abundant in the Central Valley. 50% ($\sim 40,000$ ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and 5% (~ 4000 ha) are exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily in the northern San Joaquin Valley (Modesto area).

3.2.9. Valley oak woodland

Valley oak woodland has been reduced to scattered remnants across the state, primarily on deep valley floor soils. 20% (11,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$. The

grassland understory is likely the most sensitive component in all oak woodlands in the short-term.

3.2.10. Blue oak woodland

Extensive stands of Blue Oak Woodlands surround the Central Valley at elevations just above the annual grassland and extend into the Inner Coast Ranges. 20% (~225,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily in the Sierra Nevada foothills.

3.2.11. Coastal oak woodland

Coastal Oak Woodlands are dominated by evergreen oak species. 30% (~130,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, much of which in the San Francisco Bay Area. 4% (~17,500 ha) are exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, all in the Los Angeles Basin.

3.2.12. Blue oak-foothill pine woodland

Blue Oak-Foothill Pine Woodland occupies elevations just above the Blue Oak Woodland. 15% (~59,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily in the Mt. Hamilton Range (southeast of San Jose) and in the Tehachapis.

3.2.13. Montane hardwood-conifer

Montane hardwood-conifer is a closed canopy forest type. 10% (~65,000 ha) is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily east of San Diego and the eastern San Bernardino Mountains. 4% is exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, adjacent to the Los Angeles Basin.

3.2.14. Montane hardwood

10% (~180,000 ha) of montane hardwood forest is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, including parts of the San Francisco Bay Area, San Diego, and the eastern San Bernardino Mountains. Only 1% is exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, adjacent to the Los Angeles Basin.

3.2.15. Valley foothill riparian

Valley-Foothill Riparian forests have been reduced to scattered remnants across the Central Valley and other inland valleys. 59% (~30,000 ha) is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and 10% is exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily in the northern San Joaquin Valley near Modesto, with small remnants in the Los Angeles Basin.

3.2.16. Montane riparian

Montane riparian forests occur as narrow strips in canyon bottoms in most mountain ranges in California. 10% (~8500 ha) is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily in the Transverse ranges near Ventura.

3.2.17. Mixed chaparral

Mixed chaparral occurs in numerous mountain ranges across California, and consists of diverse shrub species in various combinations that depend on local factors. 40% (760,000 ha) is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and 10% (190,000 ha) is exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, with the highest exposure in extensive stands in the mountains around the Los Angeles basin.

3.2.18. Chamise redshank chaparral

Chamise redshank chaparral is dominated by *Adenostoma* sp. and is particularly abundant near the San Diego-Riverside County border. 50% (228,000 ha) is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and only 2%–3% is exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.19. Unknown shrub type

Various stands of difficult-to-characterize shrub stands in the Coast Ranges and Sierra Nevada foothills fall in this category. Twenty percent (41,000 ha) is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and very little ($< 1\%$) is exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.20. Bitterbrush

Stands of bitterbrush are distributed on the Modoc Plateau and around the Owens Valley, and are in relatively clean air areas. $< 1\%$ (1000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.21. Alpine-dwarf shrub

Alpine-dwarf shrub is distributed along the crest of the High Sierra and is minimally exposed to N-deposition.

3.2.22. Sagebrush

Sagebrush is mainly distributed east of the Sierra Nevada and Cascade ranges, with outlying patches in Mojave Desert mountains, Tehachapis, and Transverse Ranges. Less than 2% is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.23. Montane chaparral

Montane chaparral is distributed at high elevations in the Sierra Nevada, Cascades, and Klamath Mountains. Small patches are found in the high mountains outside Los Angeles. About 5% (30,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily around the Los Angeles Basin.

3.2.24. Low sage

Low sage is distributed on the Modoc Plateau, and around the Owens Valley. None is exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.25. Ponderosa pine

Ponderosa Pine forests are distributed in the Sierra Nevada, Cascades, and Klamath Mountains. About 5% (15,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily in the southern Sierra Nevada.

3.2.26. Jeffrey pine

Jeffrey Pine forests are distributed in the central, southern and Eastern Sierra Nevada, with outlying stands in the Transverse ranges and Peninsular Ranges. 7% (20,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and 6,000 ha are exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ in the Los Angeles Basin.

3.2.27. Sierran mixed conifer

Sierran mixed conifer forests are distributed along the whole length of the Sierra Nevada and Cascades, with outliers in the Transverse and Peninsular Ranges. 4% (80,000 ha) are

exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, and 17,000 ha are exposed to $> 10 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ around the Los Angeles Basin.

3.2.28. White fir

White Fir forests are distributed in the Northern Sierra Nevada, Cascades, and Klamath Mountains. Less than 1% are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.29. Lodgepole pine

Lodgepole Pine forests are distributed in the Sierra Nevada and Cascade Ranges. 0.5% (1,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.30. Red fir

Red-fir forests are distributed in the Sierra Nevada and Cascades. 0.5% (2,500 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.31. Subalpine conifer

Subalpine conifer forests are distributed across the High Sierra, Cascades, and Klamath Mountains, with outliers at the highest elevations of the San Gabriel, San Bernardino, and San Jacinto Mountains. 2% (5,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ around the Los Angeles Basin.

3.2.32. Eastside pine

Eastside pine forests are distributed primarily east of the Cascades, with outliers on the east flanks of the San Gabriel and San Bernardino Mountains. 3% (15,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ around the Los Angeles Basin.

3.2.33. Redwood

Redwood forests are distributed along the coast from Big Sur north. About 10% (50,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, in the San Francisco Bay Area. This may be an overestimate, because the 36 km CMAQ map does not capture steep coastal deposition gradients in Santa Cruz and Sonoma Counties.

3.2.34. Klamath mixed conifer

Klamath mixed conifer forests are distributed in far northern California, distant from major pollution sources. None are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, with the highest exposure ($4\text{--}5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$) northeast of the Sacramento Valley.

3.2.35. Unknown conifer type

Coniferous forests of unclassified composition(s) are distributed in the Santa Cruz Mountains and Diablo Range, along with small patches along the west slope of the Sierra Nevada and the Tehachapis. 60% (26,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$, primarily in the southern San Francisco Bay Area.

3.2.36. Juniper

Juniper forests are distributed on the eastern slopes of most major mountain range, including the Peninsular and Transverse Ranges. 15% (60,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ in Southern California.

3.2.37. Aspen

Aspen forests are distributed in the Central Sierra Nevada, and none are exposed to > 5 kg-N ha⁻¹ yr⁻¹. Aspens themselves are present in many mid-high elevation coniferous forest types, including those of the Los Angeles Basin.

3.2.38. Closed-cone pine-cypress

Closed-cone pine-cypress forests are distributed in scattered pockets from the Mexican border to the North Coast Ranges. These forests contain some narrowly distributed conifers such as the Tecate Cypress in San Diego County. 10% (6,200 ha) are exposed to > 5 kg-N ha⁻¹ yr⁻¹.

3.2.39. Pinyon juniper forests

Pinyon-juniper forests are distributed on the east flanks of most mountain ranges. 13% (60,000 ha) are exposed to > 5 kg-N ha⁻¹ yr⁻¹, primarily on the east flanks of the Peninsular ranges.

3.2.40. Eucalyptus

Non-native eucalyptus forests were planted in many parts of California, relatively close to urban areas. 50% (2800 ha) are exposed to > 5 kg-N ha⁻¹ yr⁻¹. Eucalyptus can invade adjacent native habitats, and groves on the immediate coast often support overwintering monarch butterflies.

3.2.41. Desert riparian

Small patches of desert riparian habitats are distributed across the Mojave and Colorado Deserts. 15% (2800 ha) are exposed to > 5 kg-N ha⁻¹ yr⁻¹ in the western Mojave Desert. Desert riparian zones are susceptible to invasions by non-native tamarisk.

3.2.42. Palm oasis

Small areas of *Washingtonia* palms (total 1250 ha) exist around springs in the SW California deserts. 2.5% (35 ha) are exposed to > 5 kg-N ha⁻¹ yr⁻¹.

3.2.43. Desert scrub

Desert scrub is distributed across southeastern California. 27% (2,000,000 ha) are exposed to > 5 kg-N ha⁻¹ yr⁻¹, primarily from the western Mojave Desert south to Eastern San Diego County.

3.2.44. Alkali desert scrub

Alkali desert scrub occupies saline valley bottoms across the Mojave Desert, with outliers in the Southern Inner Coast Range. 15% (270,000 ha) are exposed to > 5 kg-N ha⁻¹ yr⁻¹, primarily in the western Mojave Desert.

3.2.45. Barren

Barren land is distributed as high alpine (Sierra Crest and other high mountains) and low desert (Death Valley). 3% (50,000 ha) are exposed to > 5 kg-N ha⁻¹ yr⁻¹, primarily in the Mojave Desert.

3.2.46. Joshua tree

Joshua tree woodlands are concentrated in the little San Bernardino Mountains. 50% (16,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$. Joshua trees themselves are much more widely distributed at middle elevations in the Mojave Desert than they are in the map of this vegetation type in Appendix A.

3.2.47. Desert succulent scrub

Desert succulent scrub, with a high proportion of cacti and other fleshy plants, is distributed in low-elevation deserts in San Diego and Imperial Counties. 17% (45,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

3.2.48. Desert wash

Desert washes are distributed in far southeastern California (Colorado Desert). 2.5% (26,000 ha) are exposed to $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$.

Figure 10. Cumulative distribution functions of N-deposition exposure of FRAP vegetation types. The FRAP code numbers for each vegetation type are in parentheses, followed by total area in hectares so that proportions (Y axis) may be converted to area affected. Maps of each vegetation type are presented in Appendix A, in the same order.

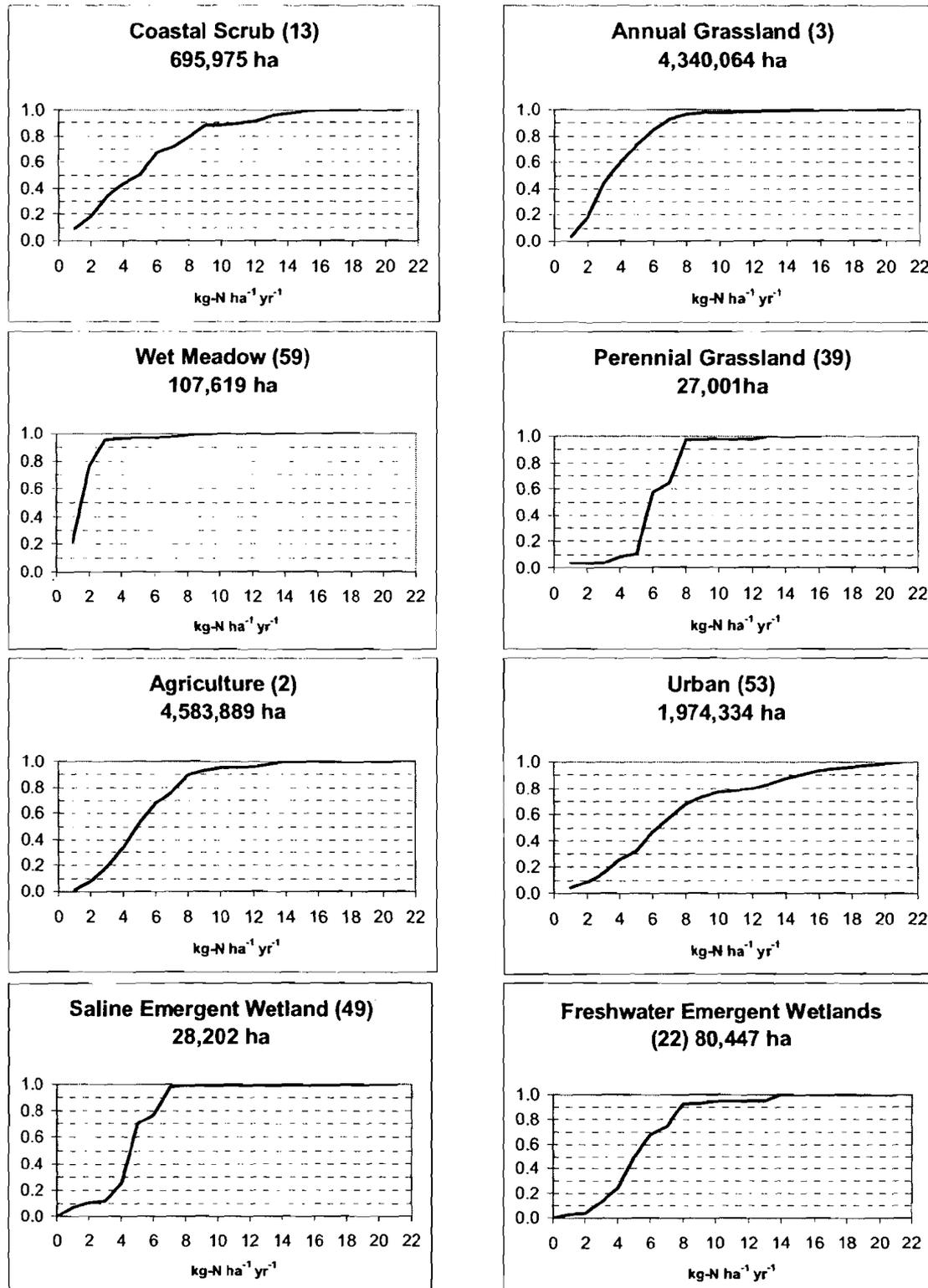


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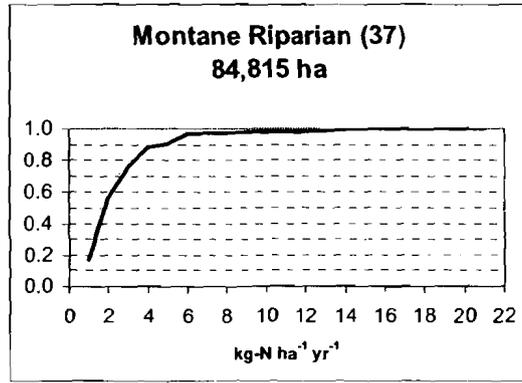
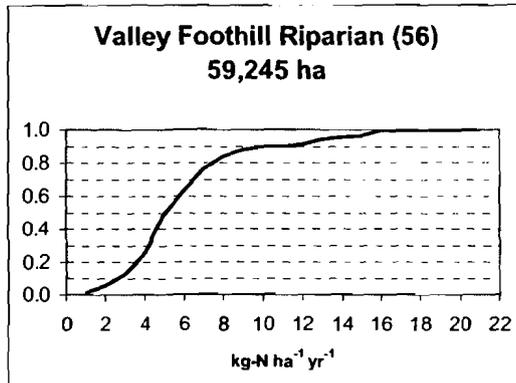
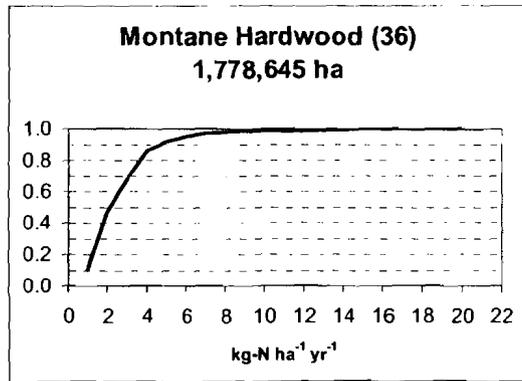
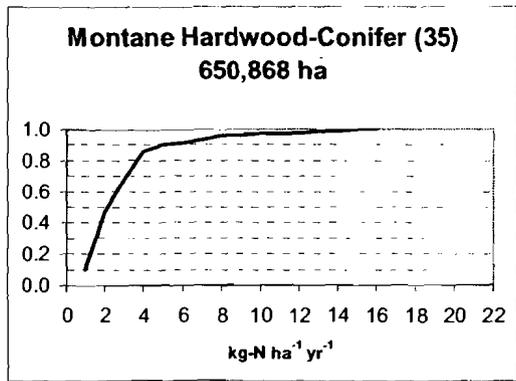
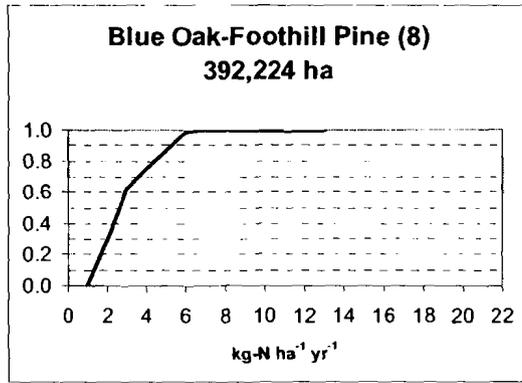
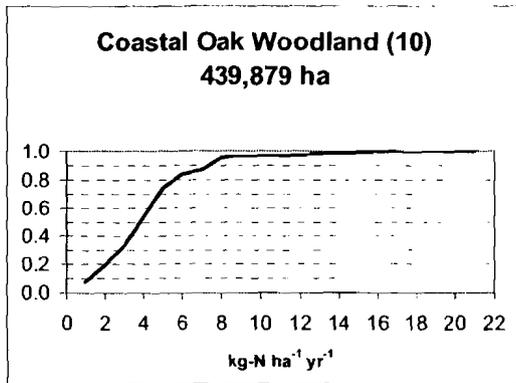
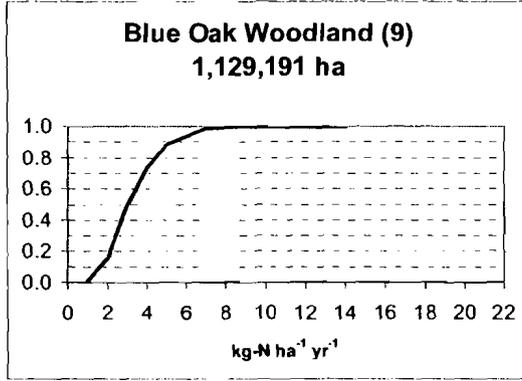
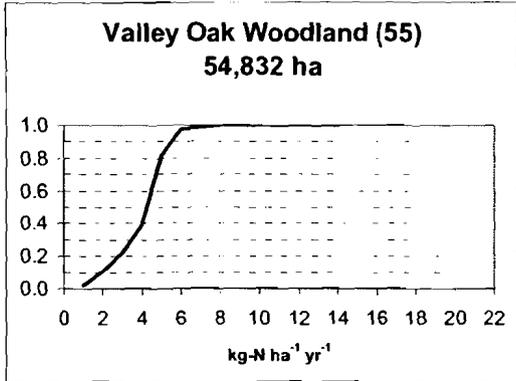


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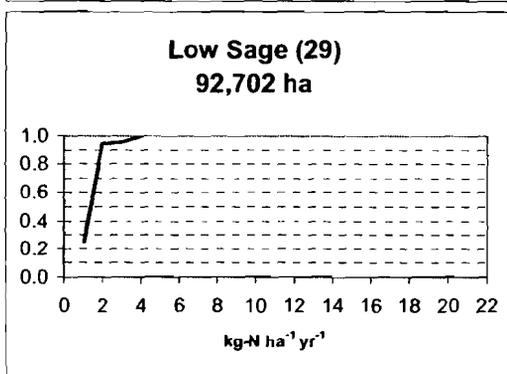
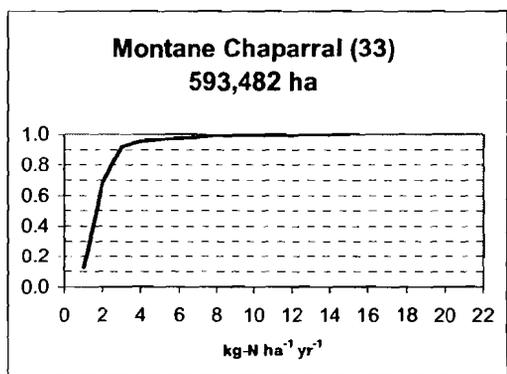
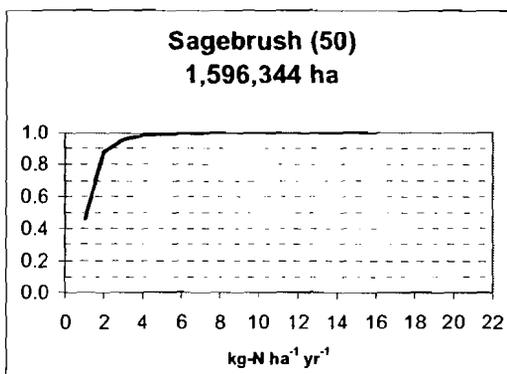
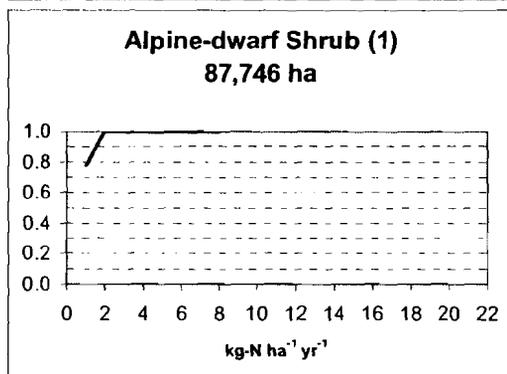
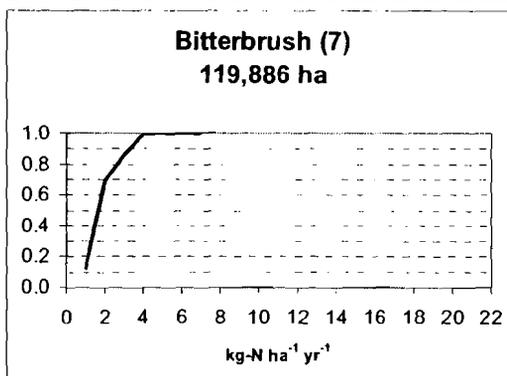
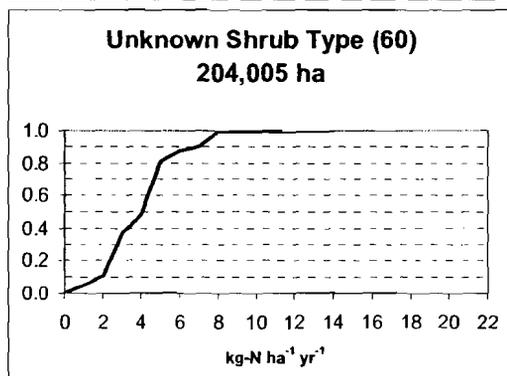
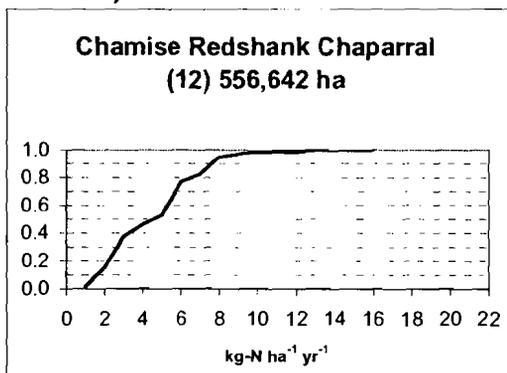
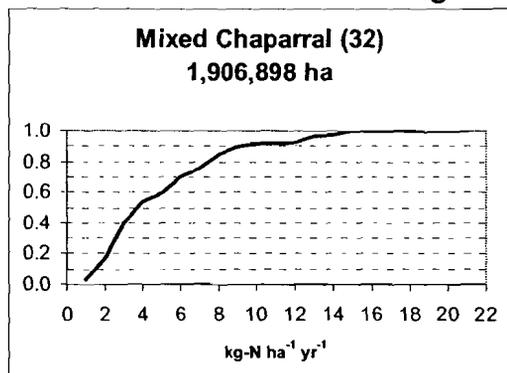


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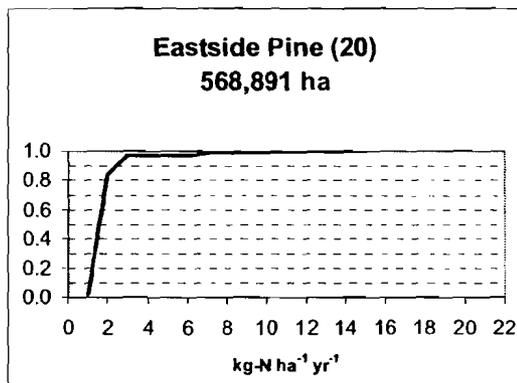
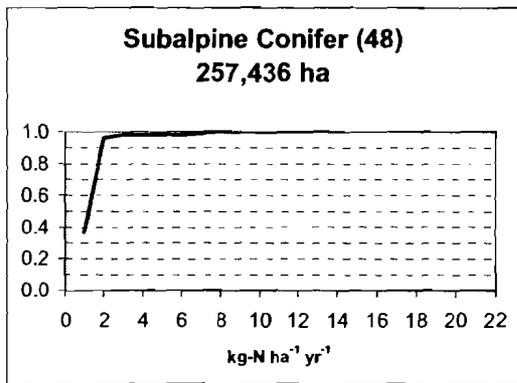
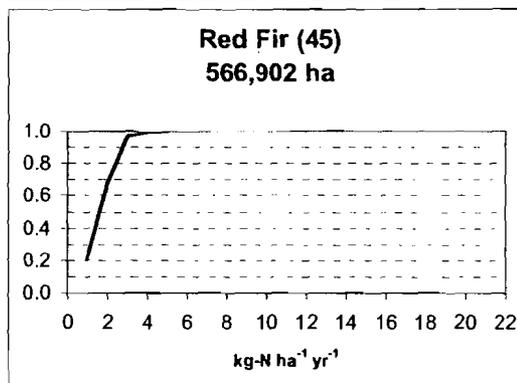
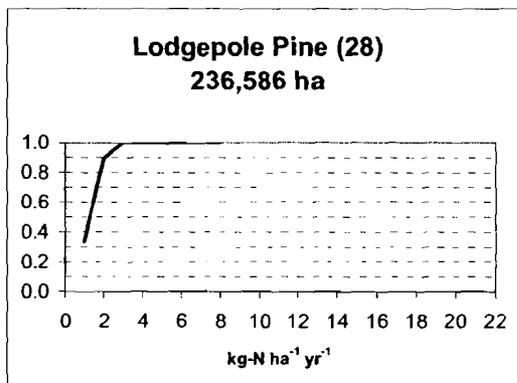
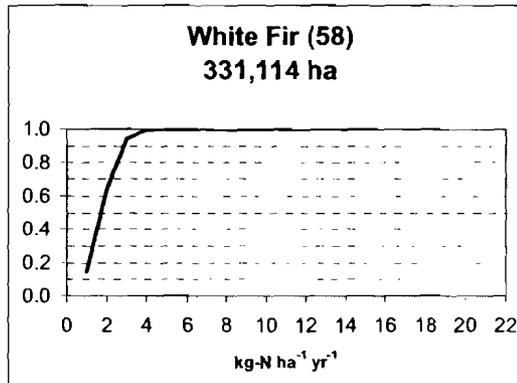
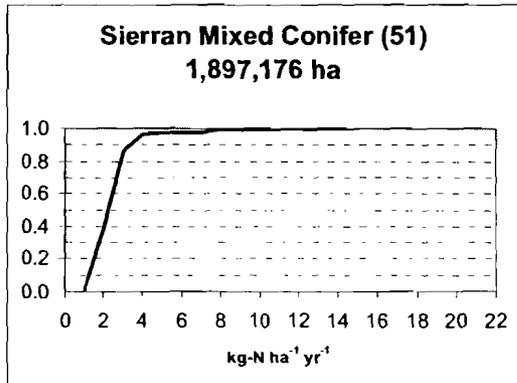
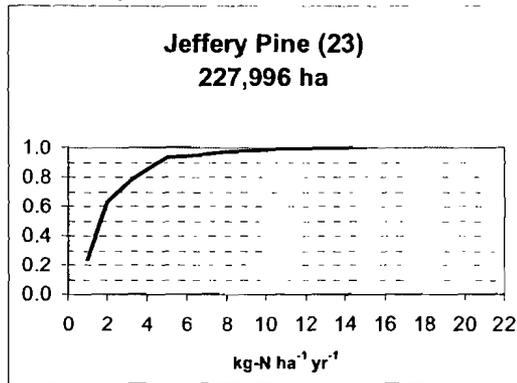
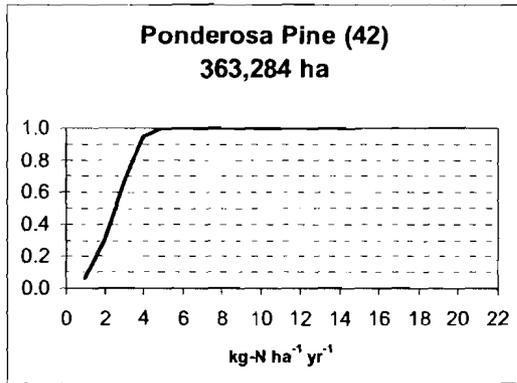


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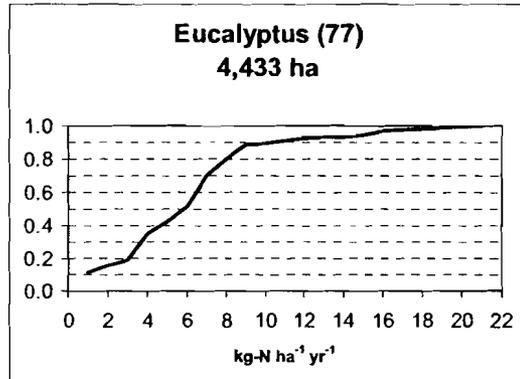
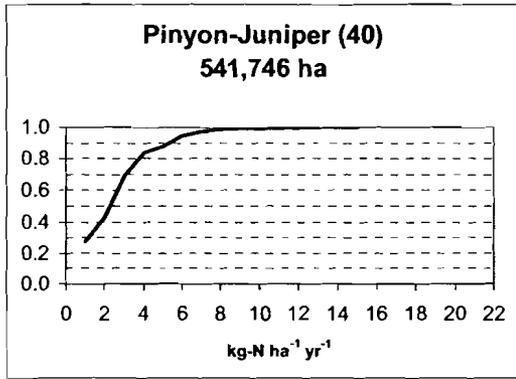
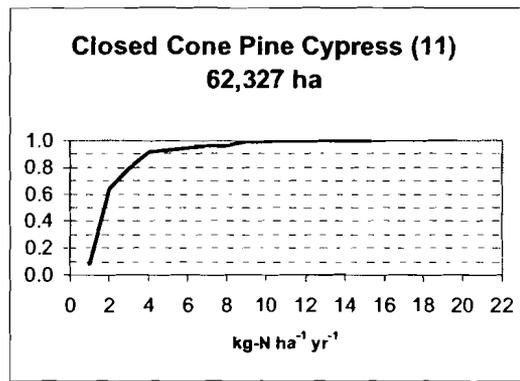
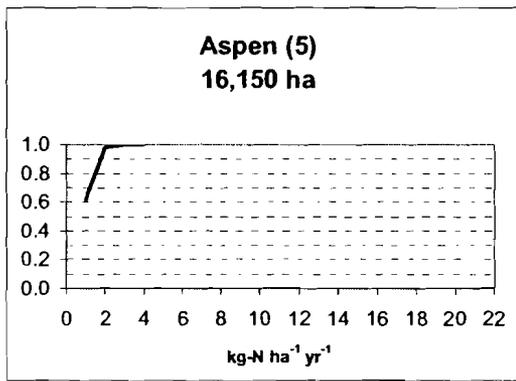
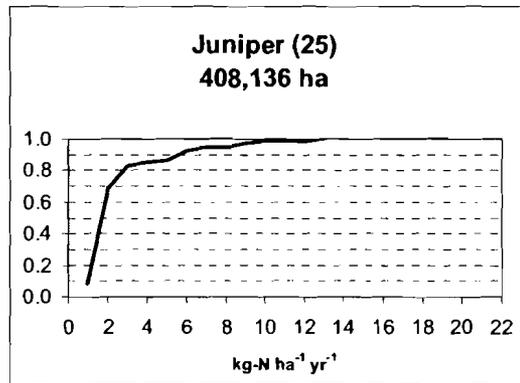
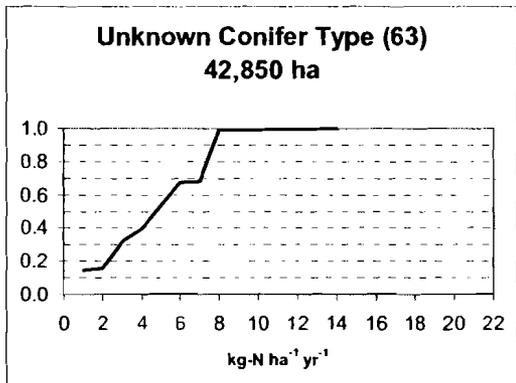
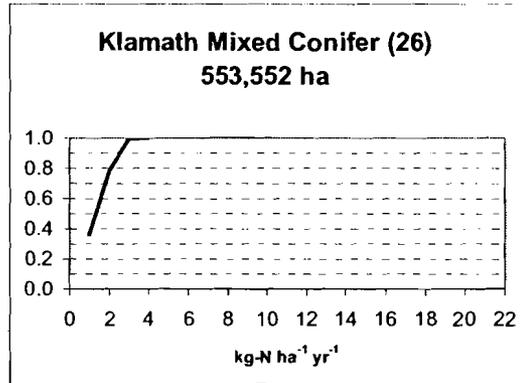
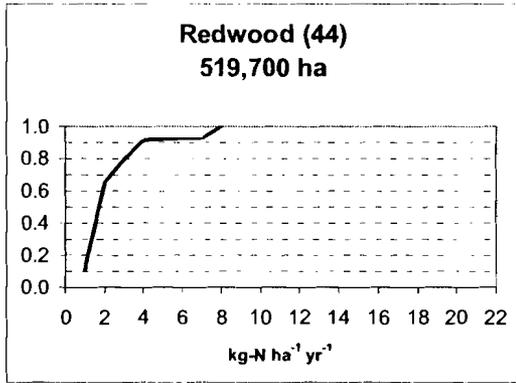
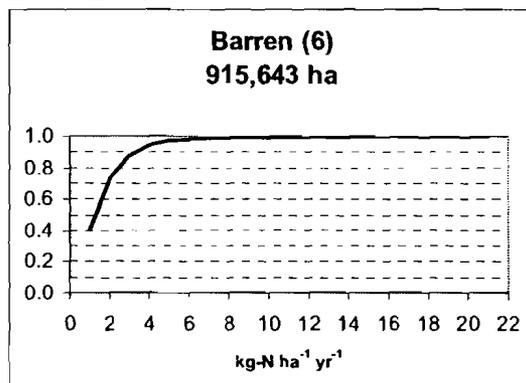
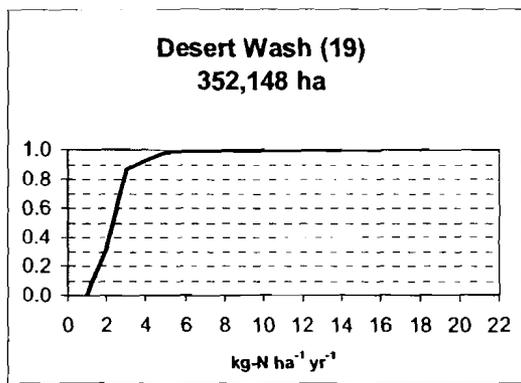
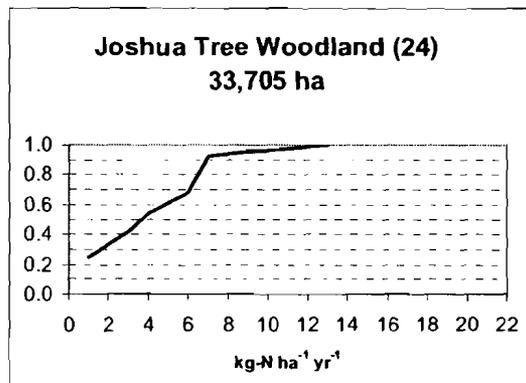
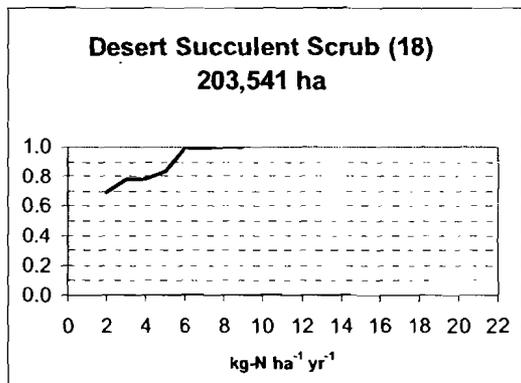
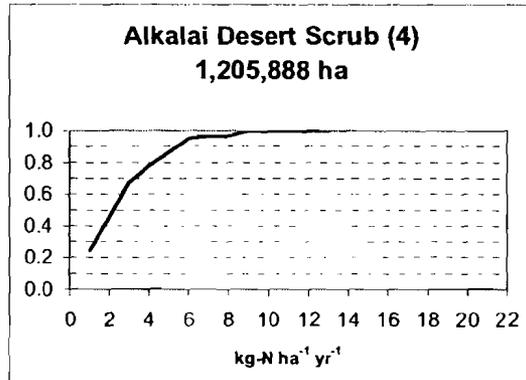
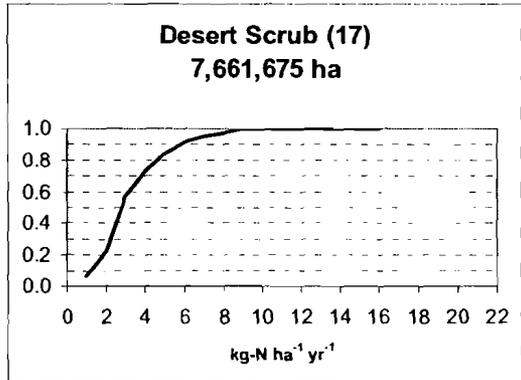
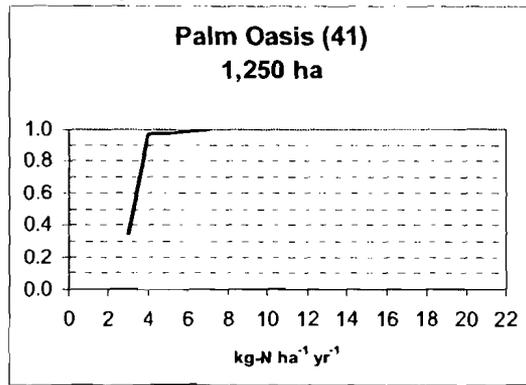
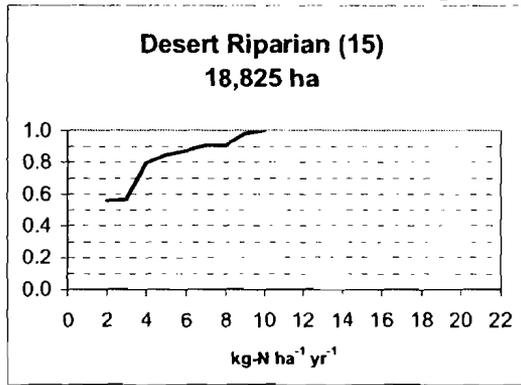


Figure 10. (continued)



4.0 Exposure and Risks to Endangered, Threatened, and Rare Species

4.1. Methods

This section presents the results of an overlay of the CNDDDB and the CMAQ 36 x 36 km map for total N-deposition in 2002. This analysis considers 1242 plant taxa in the CNDDDB, including 225 taxa (species, subspecies, and varieties) that are federal- or state-listed as "threatened or endangered." The remaining 1017 taxa are regarded as rare, and include CNPS listed species (CNPS 2003). Mean exposure was calculated using all CNDDDB occurrences, so that if a taxon has multiple occurrences in a single CMAQ grid square, all of those occurrences are used to derive the mean exposure. Maximum and minimum exposure across the full range of each taxon were also reported.

The same analysis is also done for the 447 animal taxa in the CNDDDB, including 108 taxa (species, subspecies, and varieties) that are federal- or state-listed as "threatened or endangered," and an additional 339 taxa considered rare.

The full results are presented in Appendix B, which is in a spreadsheet format that can be filtered and searched for specific taxa.

Data are presented as CDF graphs of mean exposure and maximum exposure, so that (similar to the vegetation-type analysis) the total number of taxa above and below any given threshold can be obtained readily. The absolute numbers have been used instead of percentages. Note that the orderings of taxa for mean and maximum N-deposition exposure are different.

Note that this analysis is not appropriate for assessing site or region-specific impacts, nor is it sufficient for detailed species-specific assessment. CNDDDB-type data are admittedly incomplete and have various degrees of bias, but the overall range of most taxa is at least coarsely accurate. The mean exposure is the prime risk criteria for the present analysis. The maximum exposure analysis can suggest that some part of the species range may be highly exposed, but the 36 km resolution of the CMAQ map makes definitive statements about taxon- and site-specific exposure difficult, until the 4 km CMAQ map becomes available in 2006. The problem is especially acute in near-coastal areas with steep pollution gradients, but local hotspots will undoubtedly be found in nearly many regions of the state.

Information on life history and habitat was compiled for 389 plant taxa with exposure $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$. This threshold represents the lowest critical loads established for European grasslands (Bobbink and Roelofs 1995), and *serves only as benchmark for coarse screening at present*, and identifies relatively high pollution areas in California according to the 36 km CMAQ map. To reemphasize, this report's authors do not yet know the critical loads for California ecosystems, let alone loads that threaten any individual plant taxa. The data can be reanalyzed for any chosen threshold. Life history and habitat were obtained from Calflora and the online *Jepson Manual*; habitat was identified as best as possible from these descriptions. Identification of special soil types—serpentine, limestones, pebble plains, gabbros, and lone clays—is included in habitat when noted,

so that soil endemics (see Section 2.7.10.) can be mapped out. Habitat and life history factors are presented in tables for selected groups of plants.

4.2. Results

4.2.1. Plant taxa

A substantial fraction of the 225 threatened and endangered (T&E) plant taxa are exposed to elevated N-deposition (Figure 11). There are 126 taxa below the 5 kg-N ha⁻¹ yr⁻¹ mean benchmark, and 99 above. There are 6 T&E plant taxa above the 10 kg-N ha⁻¹ yr⁻¹ mean benchmark.

For maximum exposure, 93 taxa are below and 132 taxa are above 5 kg-N ha⁻¹ yr⁻¹, and 31 are above 10 kg-N ha⁻¹ yr⁻¹ (Figure 12). Note again that any benchmark may be chosen on these graphs.

Similar proportions apply to the 1017 listed rare taxa. There are 727 taxa below 5 kg-N ha⁻¹ yr⁻¹ and 290 are above (Figure 13). There are 24 taxa above 10 kg-N ha⁻¹ yr⁻¹. For maximum exposure, 597 taxa are below and 420 taxa are above 5 kg-N ha⁻¹ yr⁻¹ (Figure 14), and 72 are above 10 kg-N ha⁻¹ yr⁻¹.

The map of occurrences of T&E taxa with mean exposure > 5 kg-N ha⁻¹ yr⁻¹ clearly show concentrations in the high N-deposition regions: Southern California, the floor and east side of the Central Valley, and the San Francisco Bay Area (Figure 15).

It is beyond the scope of this report to discuss individual plant taxa, given the high numbers in the analysis. All CNDDDB plant taxa are listed in Appendix B, along with mean, maximum, and minimum N-deposition, initial habitat assignment for the higher exposure plants, federal status, state status, and global and state ranks according to The Nature Conservancy. Note that this list provides only a starting point for regional and local assessments, especially assignments to specific vegetation types.

A breakdown of life form of listed taxa exposed to > 5 kg-N ha⁻¹ yr⁻¹ (Table 2) shows that most listed taxa are perennial and annual forbs (including several hemiparasitic taxa), followed by shrubs, and then a variety of other life-forms. Annual forbs may be the most immediately vulnerable to annual grass invasions, but in the long run, perennial forbs and shrubs may be at risk from habitat conversion via fire. Assignment of quantitative risk factors based on life history will eventually require a taxon-by-taxon analysis.

A breakdown by habitat (Table 3) shows that 23 T&E plant taxa and 22 rare taxa are vernal pool dependent. Vernal pool taxa are concentrated on the east side of the Central Valley, the Southern California Coast, and the North Bay Area (Figure 16). Assignment of taxa to specific vegetation types will require a regional scale assessment by local experts; available data (CalFlora and Jepson Herbarium) were insufficiently precise for systematic use in this report.

Many other taxa are in low-biomass habitats that are at risk from annual grass invasions, including sandy soils, clay, grasslands, open areas, and meadows, among others. There are sets of taxa that are specialized on particular soils; these soil endemics with mean exposure $> 5 \text{ kg-N ha}^{-1} \text{ yr}^{-1}$ include: serpentines in the Bay Area, gabbro; lone clays, and serpentine in the Sierra Foothills; limestone in the San Bernardino Mountains; and metavolcanics east of San Diego (Figure 17).

As mentioned above, these analyses are constrained by the coarse resolution of the 36 km CMAQ map, especially in coastal areas. Subregional patterns will be resolved with finer resolution N-deposition modeling from the 4 km map. Note also that some highly exposed plant taxa have outliers in low N-deposition regions.

Once again, the results indicate a need for regional and subregional analyses, and Appendix B provides a starting point. Specific treatment of more than a few taxa is beyond the scope of this report.

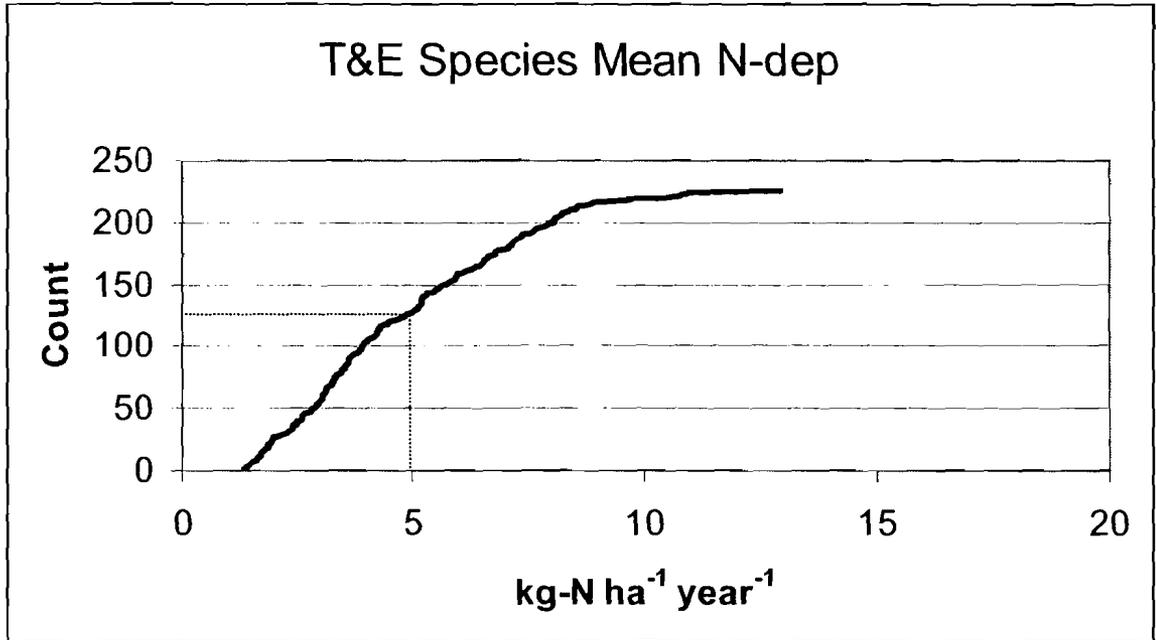


Figure 11. Average N-deposition exposure, state- and federal-listed T&E plant taxa (n = 225)

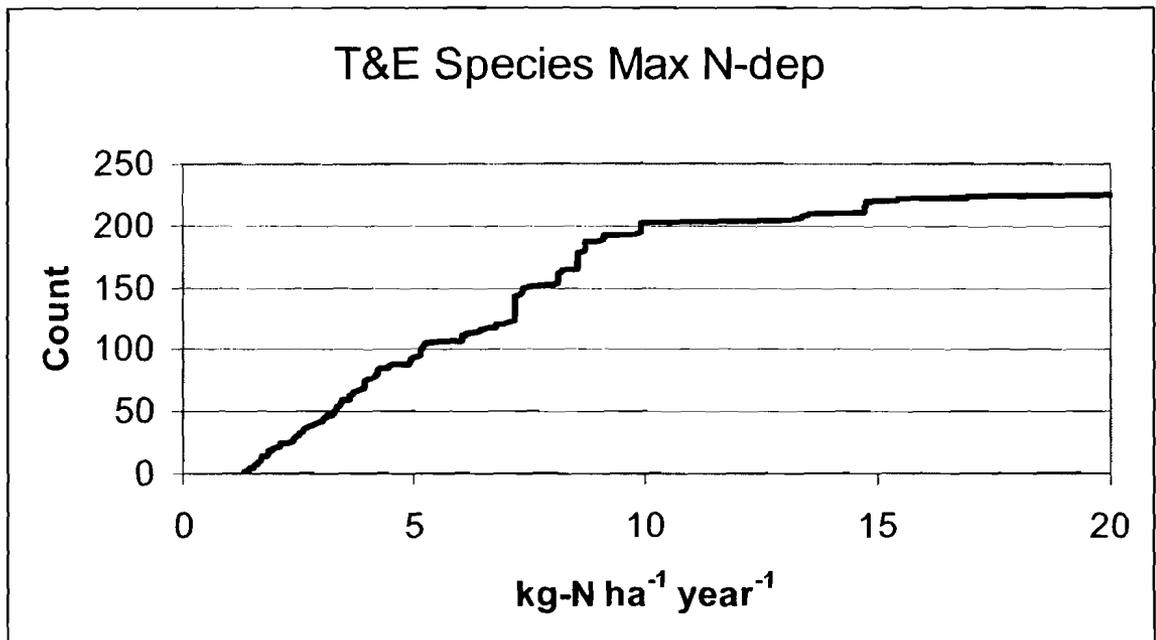


Figure 12. Maximum N-deposition exposure, state- and federal-listed T&E plant taxa (n = 225)

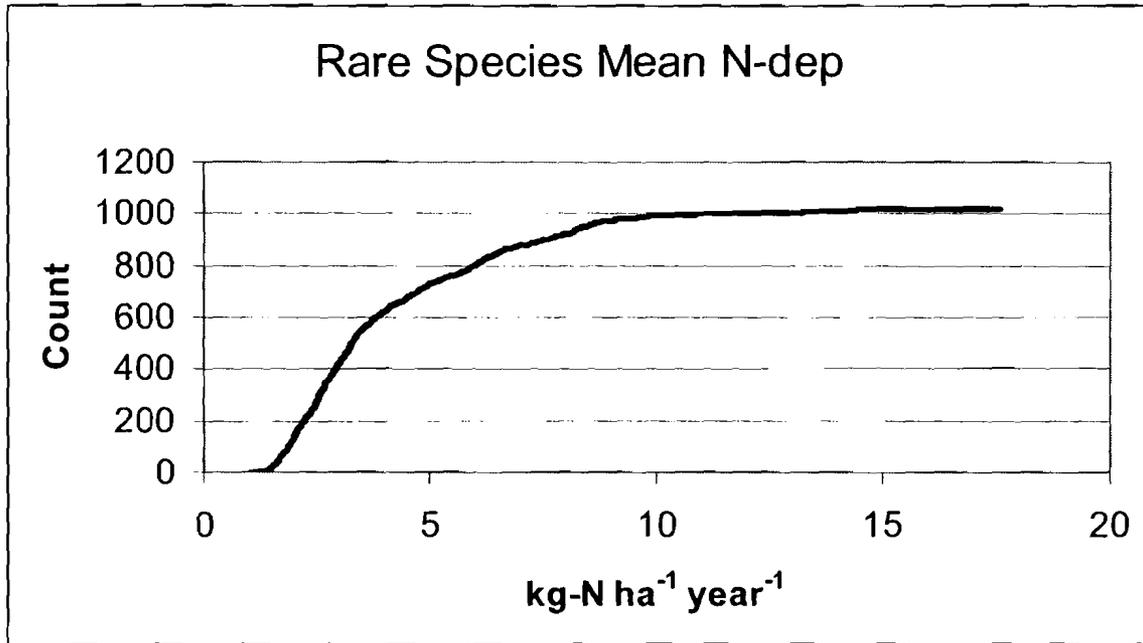


Figure 13. Mean N-deposition exposure, listed rare plant taxa (n = 1017)

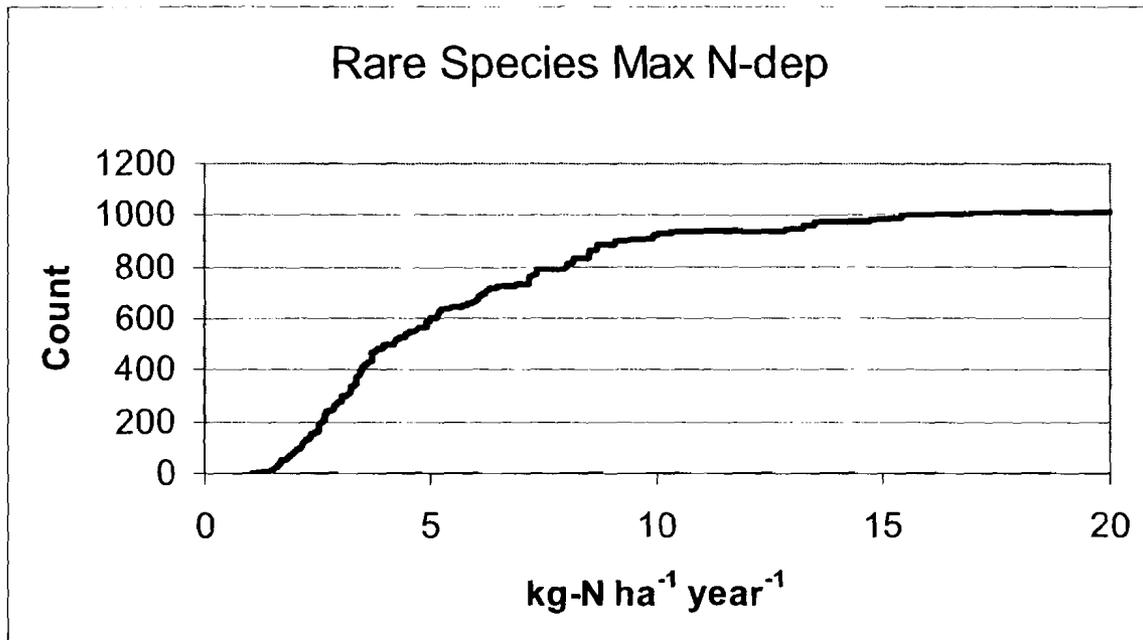


Figure 14. Maximum N-deposition exposure, listed rare plant taxa (n = 1017)

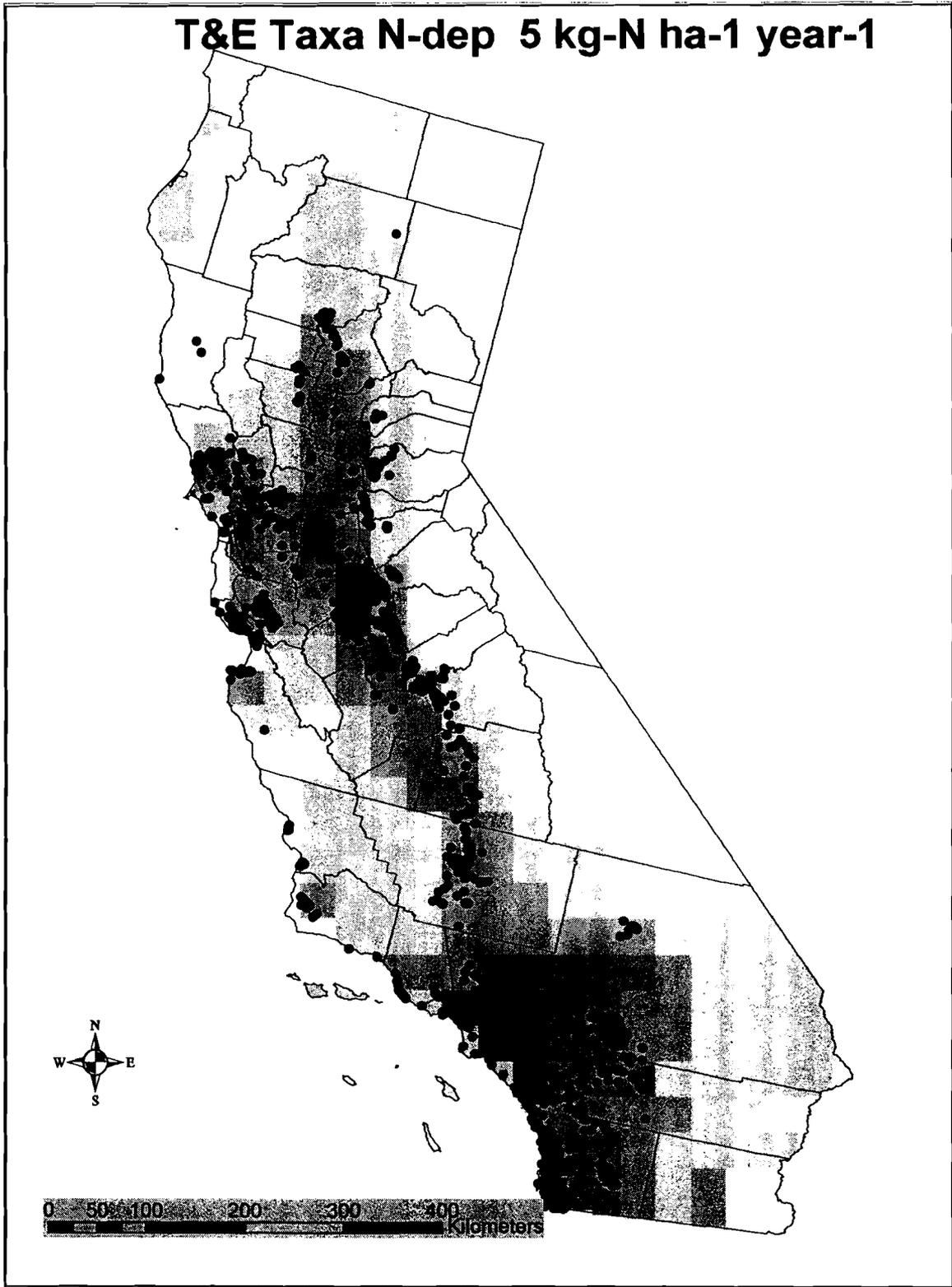


Figure 15. Distribution of federal- and state-listed T&E species exposed to > 5 kg-N ha⁻¹ year⁻¹

Table 2. Life history exposure > 5 kg-N ha-1 yr⁻¹

| Life Form | T&E | Rare | Total |
|----------------------------|----------------|-------------|--------------|
| Perennial forb | 38 | 122 | 160 |
| Annual forb | 35 | 93 | 128 |
| Shrub | 10 | 41 | 51 |
| Annual grass | 7 | 2 | 9 |
| Annual forb, hemiparasitic | 4 | 4 | 8 |
| Annual-Perennial forb | 3 | 5 | 8 |
| Tree | 1 | 6 | 7 |
| Perennial cactus | 1 | 4 | 5 |
| Perennial sedge | | 4 | 4 |
| Perennial fern | | 3 | 3 |
| Perennial Forb parasitic | | 2 | 2 |
| Annual rush | | 1 | 1 |
| Duckweed | | 1 | 1 |
| Perennial grass | | 1 | 1 |
| Perennial rush | | 1 | 1 |
| Total | 99 | 290 | 389 |

Table 3. Habitats of plant taxa exposed to > 5 kg-N ha⁻¹ yr⁻¹

| Habitat | T&E | Rare | Total |
|--------------------|-----------|------------|------------|
| (blank) | 17 | 58 | 72 |
| Rocky | 6 | 41 | 47 |
| Vernal pools | 23 | 22 | 45 |
| Sandy | | 25 | 25 |
| Open areas | 1 | 18 | 19 |
| Serpentine | 8 | 11 | 19 |
| Meadows | 5 | 13 | 18 |
| Alkali | 1 | 13 | 14 |
| Dry soils | 1 | 12 | 13 |
| Clay | 5 | 7 | 12 |
| Pebble-plain | 2 | 8 | 10 |
| Riparian | 1 | 9 | 10 |
| Dunes | 4 | 4 | 8 |
| Freshwater-marsh | 3 | 5 | 8 |
| Washes | | 8 | 8 |
| Limestone | 3 | 3 | 6 |
| Disturbed | 1 | 4 | 5 |
| Gabbro | 3 | 2 | 5 |
| Salt marsh | 3 | 2 | 5 |
| Understory | | 5 | 5 |
| Granite soils | | 4 | 4 |
| Grassland | 2 | 2 | 4 |
| lone clays* | 3 | 1 | 4 |
| Playas | | 3 | 3 |
| Alluvial fans | 2 | | 2 |
| Lake-margins | 1 | 1 | 2 |
| Sandstone | 1 | 1 | 2 |
| Scrub | 2 | | 2 |
| Bogs, seeps | 1 | 3 | 4 |
| Bluffs | | 1 | 1 |
| Exposed sites | | 1 | 1 |
| Metavolcanic | | 1 | 1 |
| Non-native** | | 1 | 1 |
| Ponds | | 1 | 1 |
| Grand Total | 99 | 290 | 389 |

* See Section 2.7.10

** There is some doubt as to whether this one rare species is native or non-native.

Vernal Pool Taxa: T&E and Rare

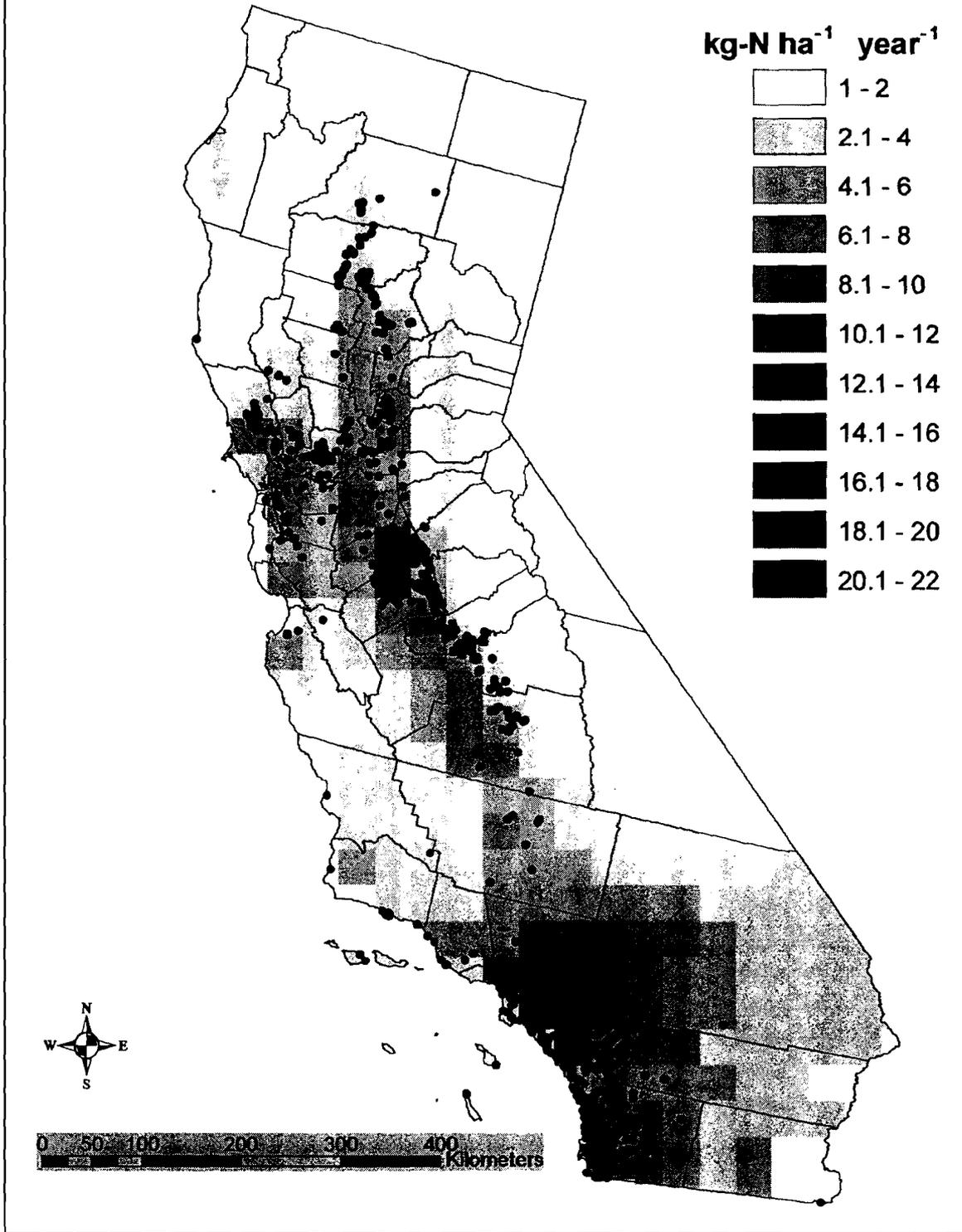


Figure 16. Location of vernal pool taxa exposed to mean > 5 kg-N ha⁻¹ yr⁻¹

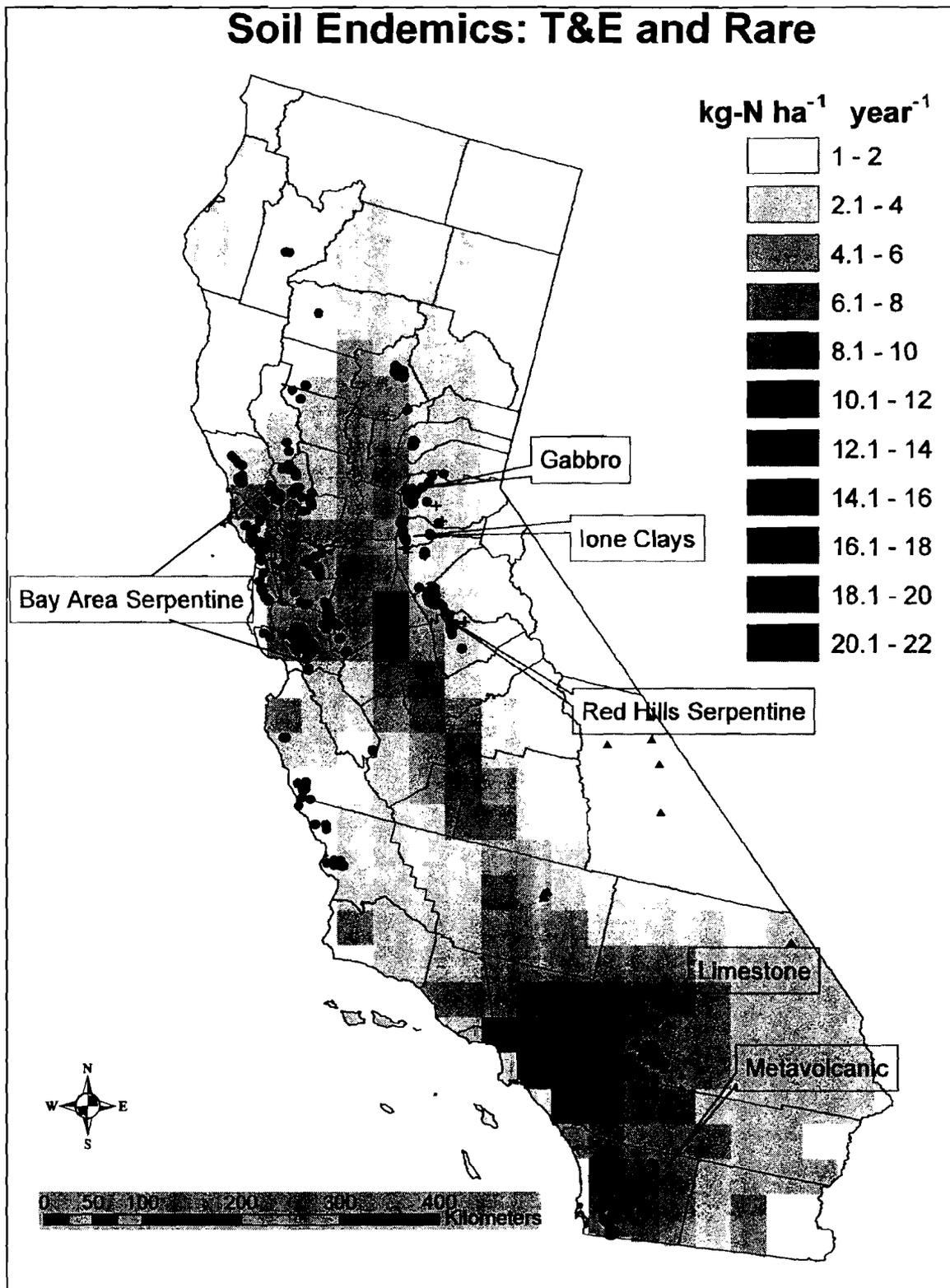


Figure 17. Locations of soil endemic plant taxa exposed to mean > 5 kg-N ha⁻¹ yr⁻¹

4.2.2. Animal taxa

The exposure of 108 T&E animal taxa is roughly parallel to that of plants. There are 62 animal taxa below the 5 kg-N ha⁻¹ yr⁻¹ mean threshold, and 46 above (Figure 18). There are 4 T&E animal taxa above the 10 kg-N ha⁻¹ yr⁻¹ mean threshold. For maximum exposure, 40 taxa are below and 68 taxa are above 5 kg-N ha⁻¹ yr⁻¹, and 28 are above 10 kg-N ha⁻¹ yr⁻¹ (Figure 19).

The exposure of 339 rare animal taxa is similar (Figure 20). There are 217 rare animal taxa below the 5 kg-N ha⁻¹ yr⁻¹ mean threshold, and 122 above. There are 5 rare animal taxa above the 10 kg-N ha⁻¹ yr⁻¹ mean threshold. For maximum exposure, 163 taxa are below and 176 taxa are above 5 kg-N ha⁻¹ yr⁻¹, and 61 are above 10 kg-N ha⁻¹ yr⁻¹ (Figure 21). The geographic distribution of exposed animal taxa is virtually the same as that of the plants, so no map has been prepared.

The CNDDDB listed animal species have broad taxonomic representation (Table 4), as do those exposed to > 5 kg-N ha⁻¹ yr⁻¹. Species-by-species accounts are beyond the scope of this report.

Vulnerability to N-deposition via grass invasions is most likely in several circumstances. Butterflies and other herbivorous insects are vulnerable to displacement of larval hostplants and nectar sources by annual grasses. These butterflies include: the Bay Checkerspot (*Euphydryas editha bayensis*), in serpentine grassland with mean N-deposition exposure of 5.1 kg-N ha⁻¹ yr⁻¹; the Quino Checkerspot (*E. editha quino*), in coastal sage scrub and grassland with mean N-deposition exposure of 6.9 kg-N ha⁻¹ yr⁻¹; and Lange's metalmark (*Apodemia mormo langei*) in the Antioch Dunes with mean exposure of 5.2 kg-N ha⁻¹ yr⁻¹. The Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) is the most highly exposed animal with mean exposure of 13.7 kg-N ha⁻¹ yr⁻¹.

Highly exposed vernal pool invertebrates include various taxa of fairy shrimp; Riverside fairy shrimp (*Streptocephalus woottoni*, mean 9 kg-N ha⁻¹ yr⁻¹), San Diego fairy shrimp (*Branchinecta sandiegonensis*, mean 8.2 kg-N ha⁻¹ yr⁻¹), Conservancy fairy shrimp (*Branchinecta conservatio*, mean 7.7 kg-N ha⁻¹ yr⁻¹), vernal pool tadpole shrimp (*Lepidurus packardii*, mean 7 kg-N ha⁻¹ yr⁻¹), Longhorn fairy shrimp (*Branchinecta longiantenna*, mean 6.5 kg-N ha⁻¹ yr⁻¹), and vernal pool fairy shrimp (*Branchinecta lynchi*, mean 6.0 kg-N ha⁻¹ yr⁻¹) are all vulnerable to grass invasions that shorten the inundation periods of pools (Marty 2005). California red-legged frogs (*Rana aurora draytonii*, mean 5 kg-N ha⁻¹ yr⁻¹) and Tiger salamanders (*Ambystoma californiense*, mean 6.1 kg-N ha⁻¹ yr⁻¹) often breed in vernal pools and are also highly susceptible to shortened inundation periods.

Animal species dependent on coastal sage scrub, such as the coastal California gnatcatcher (*Poliioptila californica californica*, mean 8.7 kg-N ha⁻¹ yr⁻¹) are vulnerable to habitat conversion to annual grassland. Animal species dependent on desert scrub may also be vulnerable to habitat conversion.

Threatened and endangered animal taxa and mean, maximum, and minimum N-deposition exposure are listed in Appendix B.

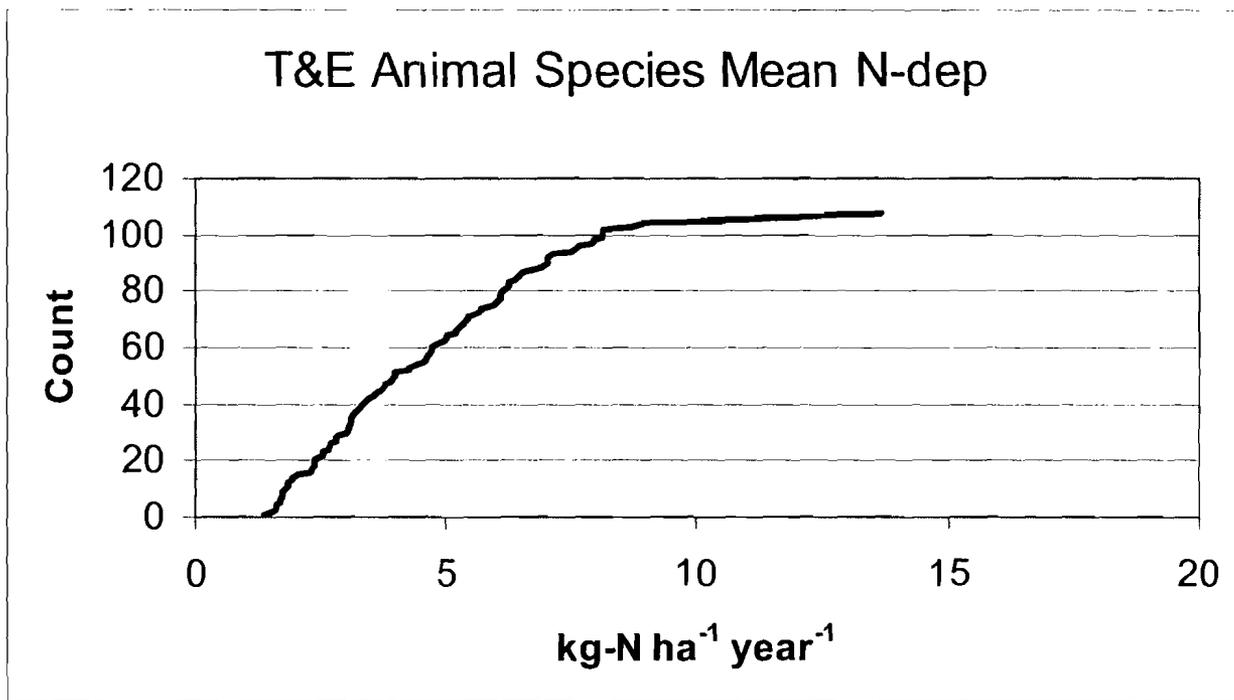


Figure 18. Average N-deposition exposure, state- and federal-listed T&E animal taxa (n = 108)

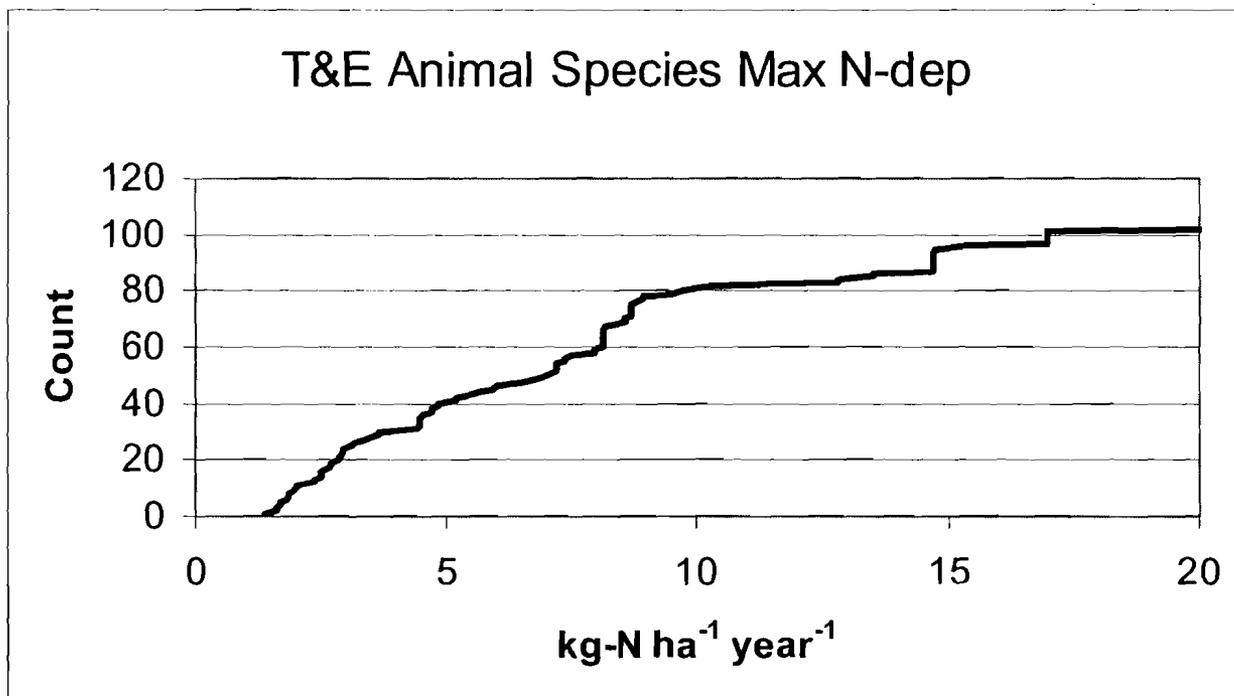


Figure 19. Maximum N-deposition exposure, state- and federal-listed T&E animal taxa (n = 108)

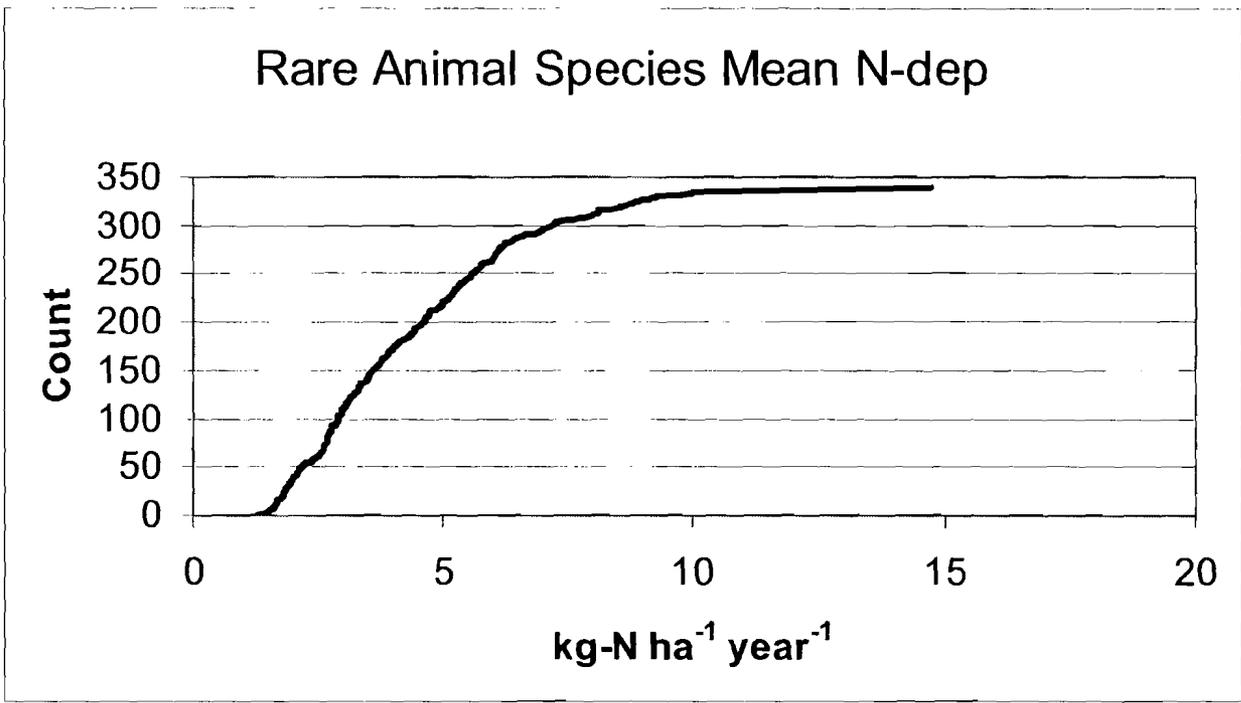


Figure 20. Mean N-deposition exposure, state- and federal-listed rare animal taxa (n = 339)

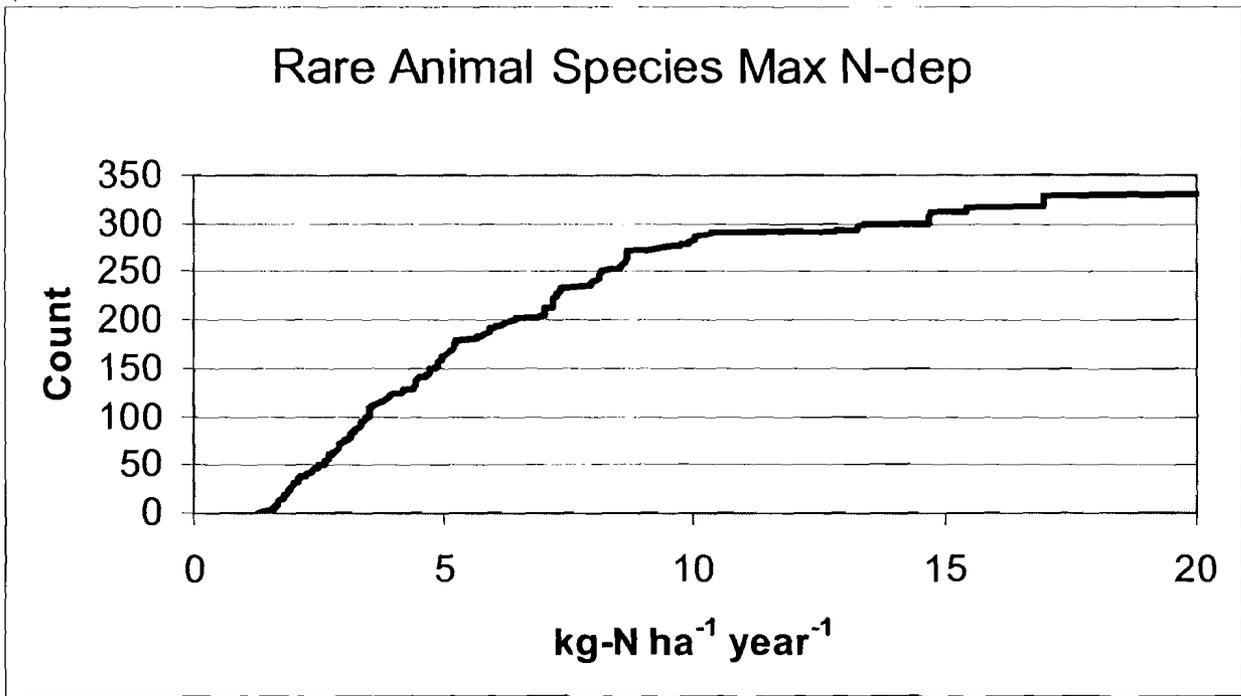


Figure 21. Maximum N-deposition exposure, state- and federal-listed rare animal taxa (n = 339)

Table 4. Taxonomic composition of T&E and rare animals

| Life Form | T&E All | Rare All | T&E > 5 kg-N | Rare > 5 kg-N |
|--------------------|------------------------|---------------------|--------------------------------|-----------------------------|
| Fish | 26 | 35 | 6 | 6 |
| Bird | 25 | 65 | 8 | 28 |
| Insect | 19 | 59 | 9 | 22 |
| Mammal | 17 | 62 | 9 | 27 |
| Invertebrate | 9 | 60 | 7 | 10 |
| Reptile | 7 | 25 | 3 | 19 |
| Amphibian | 5 | 32 | 4 | 10 |
| Grand Total | 108 | 339 | 46 | 122 |

5.0 Policy Implications

There is broad scientific consensus that atmospheric nitrogen deposition profoundly changes functioning of ecosystems, which can lead to losses of biological diversity in both terrestrial and aquatic ecosystems (Vitousek 1994; Vitousek, Aber et al. 1997; Fenn, Poth et al. 1998; Galloway, Cowling et al. 2002; Matson, Lohse et al. 2002; Galloway, Aber et al. 2003). A recent synthesis of N-deposition effects in the Western United States (Fenn, Baron et al. 2003; Fenn, Haeuber et al. 2003) documents impacts on numerous California ecosystems. Large areas of California are exposed to highly elevated N-deposition, and the 36 km CMAQ map captures the geographic distribution at a regional level. In this report, the broad-scale overlays of 36 km CMAQ N-deposition with vegetation-types and special status species illustrate the broad threat that N-deposition poses to biodiversity across much of California.

The best documented mechanism for biodiversity impacts is the enhanced invasion of introduced annual grasses, which directly crowd out native species, shorten the fire cycle, and alter hydrology, microclimate, and nutrient cycling (D'Antonio and Vitousek 1992). These effects have been documented and explicitly linked to N-deposition in coastal sage scrub, serpentine grassland, and desert scrub (Fenn, Baron et al. 2003). Annual grass invasions also threaten vernal pools (Marty 2005), and are likely enhanced by N-deposition. Species that may be at risk include many narrowly distributed endemic plants that inhabit nutrient-poor soil types or microsites. Animals that depend on specific plants, hydrologic regimes, or vegetation structure are at risk in the sensitive habitat types. While annual grass invasions are well-documented, N-deposition may be enhancing the spread of numerous other weeds.

There are two routes toward minimizing and mitigating N-deposition impacts on California biodiversity: (1) decreasing N_r emissions into the atmosphere, and (2) preserving and managing sensitive habitats.

5.1. Minimizing N-deposition Impacts Via Emissions Controls

Despite the complexities of N-deposition as a process extending from initial emissions through atmospheric transport and chemical transformations; dry-and wet-deposition; changes in ecosystem function, structure, and biodiversity; and cascading "downstream" effects, the ultimate solution is to greatly decrease emissions. Some of the nitrogenous pollutants of concern are primary pollutants (NH_3 , NO_x , and N_2O). Others are secondary pollutants (HNO_3 , NO_3^- particulates, and NH_4^+ particulates). Policy and regulatory strategies can differ depending on the source and mechanisms of synthesis.

Ongoing efforts to control NO_x emissions from vehicles and industrial sources have somewhat decreased atmospheric concentrations of NO_x in many regions of California, even in the face of population growth (Alexis, Delao et al. 2001). However, emissions of NH_3 are unregulated, although increasing attention is being paid to NH_3 because of its importance as a particulate matter ($PM_{2.5}$) precursor. On a statewide basis, power plants are a relatively minor component of emissions (Alexis, Delao et al. 2001), but nonetheless add both NO_x and NH_3 that will eventually deposit somewhere downwind.

Specific to mitigating power plant sources, the application of Best Available Control Technology (BACT) and purchase of pollution credits have been implemented to meet local air quality regulations (CARB 2000). Pollution credits are primarily aimed at ozone precursors (NO_x and ROG), and direct emissions of PM₁₀. The effectiveness of BACT and emissions credits in minimizing N-deposition is complicated by two factors. First, both NO_x and ROG credits may be purchased to offset ozone precursors, so that the total NO_x emissions may not be covered by emission offsets. Second, selective catalytic reduction (SCR) is recognized as the BACT, but SCR units emit NH₃ (known as *ammonia slip*), especially as catalysts age. There are no emissions credits for NH₃, nor is the additional N-deposition taken into account for NO_x credits. Ammonia emissions from the Metcalf Energy Center (MEC) project (see Table 1) were regulated to a maximum of 10 ppm, which was used in the assessment of N-deposition impacts on adjacent and downwind serpentine grassland habitats. The actual NH₃ emissions from SCR units may be substantially less than the regulated cap.

Determining the best modeling approach for site-specific deposition estimates from new power plants is the subject of the accompanying report by Tonnesen and Wang (forthcoming).

5.2. Mitigating N-deposition Impacts: Habitat Acquisition

Given current levels of N-deposition and the premise that source controls will at best lead to gradual decreases in deposition, the only feasible immediate actions for mitigation are habitat preservation, management, and research.

Identification of sensitive habitats and plant/animal taxa at risk can begin with the analyses presented in this report. The listing of taxa in the tabular data in Appendix B provides an initial start for assessment purposes. An independent search of the CNDDDB should provide a relevant list of local special-status taxa. Local knowledge of habitat requirements can place each taxon into a habitat-type, and sensitivity to grass and other weed invasions and other impacts may be assessed. The increased N-deposition exposure of specific habitats can be estimated from modeling.

Preserving habitats through acquisition of fee title or easements is a standard mitigation practice. However, given that even a large power plant will only incrementally increase deposition in the polluted areas where species are at risk, the actual area of habitat protected in such a manner may be small relative to the extent of the target ecosystem. For example, mitigation for the MEC project included 47 ha (131 acres) of serpentine grassland habitat, in a 116 acre parcel adjacent to the power plant; and 6 ha (15 acres) several kilometers away, out of several thousand hectares of serpentine grassland. While transfer of any amount of land into protected status is a positive step, it was the *qualitative* impact of this mitigation—establishing a precedent that could be applied to highway construction, commercial/residential developments, and other power plants—that has provided the impetus for ongoing purchases of hundreds of hectares and the development of a Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) for Santa Clara County.

5.3. Monitoring, Adaptive Management, and Treatments

Monitoring and adaptive management of protected land is absolutely necessary, and can extend beyond land directly protected by purchase or easements. Numerous management treatments, including hand labor, targeted herbicides, soil/landscape disturbance, and fire are all worth exploring in one or more of the threatened ecosystems. The key is monitoring and using the monitoring data to inform the next round of treatment options—adaptive management is explicitly experimental and empirical.

For example, in serpentine grassland and vernal pools, moderate well-managed cattle grazing is effective in curbing annual grass invasions and maintaining native biodiversity and T&E/rare species. Grazing management was an explicit component of the MEC mitigation, along with adaptive management of grazing levels based on detailed monitoring of grassland composition.

Many conservation organizations, including The Nature Conservancy, California State Parks, East Bay Regional Park District, and the CNPS, are rethinking attitudes toward grazing management, because of empirical experience with negative impacts of *removing* grazing—primarily enhanced annual grass invasions that reduce native forb and grass cover. Management options may be limited, though. Grazing may be problematic in other ecosystems, such as coastal sage scrub, where the remnants of native forb cover may be on cryptobiotic crusts on clayey soils that are easily disturbed by cattle. Or, the invading grasses may be relatively unpalatable (red brome in deserts, for example).

There are relatively few options for managing annual grasses, besides livestock grazing. Fire may be useful in grasslands, but proper seasonal timing is essential and institutional barriers (air quality concerns, safety, and availability of trained personnel) can limit opportunities. Fire in grass-invaded shrublands is likely to exacerbate the problem and lead to habitat conversion unless restoration measures can be developed. Mowing can be effective if timed correctly, but may have a high cost/acre. Targeted, grass-specific herbicides can be used on fine scales, but broad applications are problematic because of cost, effectiveness, and regulatory concerns. Broadleaf weeds can be controlled by any number of approaches, as well.

Weed management is a regional-scale issue and contributions to Weed Management Areas and other organizations for long-term management of weed invasions may be effective mitigation for the dispersed impacts of N-deposition. Such contributions, in the form of a long-term endowment, may be preferable to buying small, expensive, and difficult to manage mitigation parcels, but these decisions need to be made on a case-by-case basis.

5.4. Research

Research can provide a basis for understanding the complexities of N-deposition impacts, and can guide management decisions. *Adaptive management* views management decisions as experiments that require ongoing evaluation. Monitoring the results of

management activities is essential and drastic changes in management need careful consideration and perhaps should be implemented as small-scale experiments.

The complexities of the N-cycle at global, regional, and local scales are widely recognized in the scientific community. Examples include the First, Second, and Third International Nitrogen conferences, multiple sessions at major conferences (e.g., the American Geophysical Union, Ecological Society of America, and others), and specific symposia (e.g., Atmospheric Ammonia Workshop, N-eutrophication Symposium). Many efforts are underway to define long-term research goals for N-science, and the complete research agenda is well beyond the ability of any one agency to fully fund.—Research needs are similar in scale to the carbon-cycle science that has developed over the last decade. The research recommendations below are a small subset of the potential questions and topics that are of interest to California and the Energy Commission in particular.

5.4.1. Estimates of N-deposition

Research all along the pathway of emissions/transport/chemical transformations/deposition is necessary to better quantify the flux of various N-species to ecosystems.

Emissions: Emission inventories are the most uncertain input into models such as CMAQ, and need continual improvement and adaptation to new circumstances. Emissions from power plants are monitored under AQ regulations, but the progression of NH₃ slip over several years under actual operating conditions is an uncertainty that could be reduced by compilation and analysis of emission records from existing SCR units in California and elsewhere, or by collecting new data. A 1-year pilot study could assess existing data and recommend if a multi-year monitoring program (3 years, at a series of power plants) would be necessary.

Modeling: The modeling research needs are dealt with in the accompanying report by Tonnesen and Wang (forthcoming). Ready availability of the 4 km model results—in monthly time steps and by N-species—for regional assessments and validation studies will greatly enhance the capacity to study N-deposition in California.

Measurements: Atmospheric concentrations of N_r species are first-order drivers of N-deposition, and can be measured at various time-intervals. Passive sampling systems economically measure time-averaged concentrations (days to weeks/months) of NO₂, NO, HNO₃, NH₃, and O₃, and can supplement existing AQ networks (Bytnerowicz, Arbaugh et al. 2003). Standardized measurement of NH₃ and HNO₃ concentrations are lacking in current AQ networks. A 1-year scoping study and pilot project on the design and implementation of regional and local passive monitoring networks in California would establish costs and protocols for an optimized network that could answer key N-deposition questions and be used to calibrate AQ models. The 4 km CMAQ output provides a first hypothesis on regional gradients to test with passive samplers.

Throughfall measurements, using ion exchange resins, is a passive method of estimating N-deposition to forests and shrublands but may not capture stomatal uptake and direct deposition to soil surfaces (Fenn and Poth 2004).

Passive flux monitors are a relatively new development (Fritz and Pisano 2002) that allows for directional sampling of total flux (wind speed x concentration) of the same gaseous species as passive samplers. Deployment of a network around a power plant, and relative to other local sources, would deconvolute sources and allow for estimation of the power plant contribution to local concentrations and deposition.

Direct measurement of atmospheric deposition of multiple N-species to various surfaces is one of the most technically challenging fields of science. Eddy-flux systems can be adapted for NH_3 and NO_y , and in conjunction with measurements of CO_2 and H_2O fluxes can establish key deposition parameters such as surface resistances and stomatal conductance under varying conditions and calibrate deposition models to specific ecosystems.

Recent advances in analyses of stable isotopes and radiocarbon provide opportunities to trace emissions sources, deposition rates, and biogeochemical processing (e.g. Kendall and McDonnell 1998). Nitrogen, oxygen, and carbon isotopes provide multivariate information to constrain and deconvolute N-budgets along the N-cascade.

The development of cost-effective biomonitors will be critical for realistic integrated measurements of N-deposition. Field deployable lysimeters—small pots with standardized species composition, soil, and isotopic composition—can potentially measure N-accumulation, isotopic composition, and effects on growth among growing seasons and across local and regional deposition gradients. It may be a challenge to separate out the effects of co-occurring pollutants, especially ozone, but careful consideration of initial lysimeter conditions, local pollution sources, and deployment patterns may overcome these limitations.

5.4.2. Ecosystem impacts

Further studies of all aspects of N-cycling and budgets in California ecosystems are critical. Such research will necessarily be complex, and include field surveys along local and regional gradients, site-specific experiments, modeling, and development of N-deposition indicators in an array of local ecosystems. These studies are more process oriented, and complement targeted surveys of annual grass and other weed impacts in high deposition areas.

Among the key questions to be addressed in an integrated manner are the following:

- How much N_r in various forms is deposited in particular ecosystems, and what are the effective differences between oxidized and reduced N forms? How does direct stomatal uptake effect plant performance compared with throughfall and root uptake?

- How is N-deposition accumulated, stored, cycled, and lost from various ecosystem components through time, especially in low-biomass systems? Key loss processes include: leaching, volatilization, trace gas emissions, denitrification, and fire. Key accumulation processes are plant uptake and storage, litter, and soil organic matter accumulation. The focus on semi-arid California ecosystems would include field measurements and applications of appropriate ecosystem models.
- What is the N-saturation status of California ecosystems? Assessment will require development of ecosystem indicators—N-content of vegetation and soils, readily measured processes that indicate enhanced N-cycling rates, repeatable changes in species composition—and application to known and suspected sensitive ecosystems.
- What are critical loads for particular ecosystems and habitats, and how do we account for the cumulative nature of N-deposition impacts? What are the broad implications for water quality as more ecosystems begin to export nitrate in surface and groundwater?
- How does N-deposition drive weed invasions? Which weed species are particularly advantaged under N-deposition, and how do weeds affect biogeochemical processes, and reduce native biodiversity? Mechanistic studies of differences in response between native species and introduced species could untangle the roles of herbivory, mycorrhizal status, and other ecological interactions in determining the likelihood of N-deposition impacts.
- What are the management and restoration options for mitigating N-deposition impacts? Local studies using good experimental designs should be part of any adaptive management program mandated by mitigation requirements. Other activities include: surveys of existing management activities—grazing and prescribed fire, especially—in a variety of ecosystems and establishment of exclosures.

5.4.3. Education and public awareness

The disruption of the N-cycle is a profound change that is relatively unknown among land managers, regulators, conservation groups, elected officials, and the public at large. A concerted effort to develop appropriate educational materials, both printed and web-based, to raise awareness of the magnitude and severity of the problem among the various groups is a key step in moving toward solutions.

5.5. Benefits to California

This research provides a systematic study of known and potential threats of N-deposition to California's biodiversity. The benefits to the state include the following:

- Recognition that N-deposition is a serious threat to biodiversity across much of the state is the first step in dealing with the problem. This report provides technical background material and an entry to the large worldwide N-deposition literature.

- The geographic analyses provide a basis for regional and local studies to further understand the problem. Understanding N-deposition as a driving force behind intensified annual grass invasions and potential intensification of other weed invasions, provides land managers with key information that can inform site-specific management to protect sensitive species and habitats.
- An outline of regulatory guidance (Section 5.6 below) provides a basis for more efficiently establishing mitigation requirements and options to meet those requirements.
- The research recommendations highlight promising and necessary steps to greater understanding of the N-deposition phenomenon and impacts, and can help make California a pioneer in addressing the issues.

5.6. Regulatory Guidance Outline

Based on the procedure followed for the Metcalf Energy Center (Section 5) and other power plant projects (Table 1) the following outline presents a synthesis of key questions to ask and possible avenues for effective mitigation measures. Many of the steps are already routine in an environmental assessment and can be applied to developing impact analysis and mitigation for N deposition.

- I. Estimate additional N-deposition generated by a power plant
 - A. Use maximum allowable emissions under AQ regulations for the specific plant
 1. May overestimate the actual emissions (especially SCR ammonia slip), but parallels AQ analysis
 - B. Estimate spatial distribution of deposition
 1. Model choice and implementation are covered in Tonnesen and Wang (forthcoming)
 2. Background levels for 2002 will soon be available in 4 x 4 km map from Tonnesen et al.
 3. The 36 km map is not suitable for local analysis, except to identify high deposition regions
- II. Assess potential impacts on local ecosystems and species
 - A. Develop local list of habitat types, rank into qualitative sensitivity classes according to available data
 1. The discussion in this report provides the preliminary list, but local knowledge and expertise are essential.
 2. Consider weed threats to these habitats, especially from annual grass, but also from annual and perennial forbs and shrubs.
 - B. Develop a local list of Endangered, Threatened, and Listed Species, along with habitat associations, and rank into potential sensitivity classes according to available data
 1. CNDDDB inquiry for local listed species is standard in environmental review. The list of species from the CNDDDB in Appendix B of this report

provides an initial screening for species-specific range-wide N-deposition exposure.

2. Finer-scale local data sources and experts should be consulted when available for habitat associations of listed species.

3. Sensitivity of particular species needs to be considered on a local scale. The criteria outlined here—overall exposure statewide from Appendix A, habitat type, life form, and rarity—can be used to rank risks in a local context.

4. Conduct initial surveys to identify potential weed threats to habitats and species.

C. Assess exposure of sensitive elements

1. Choose the most appropriate local/regional habitat maps with explicit connections between sensitive species and habitat types and set target areas.

2. Overlay local map of sensitive habitats with N-deposition exposure from model.

3. If detailed species distributions data are available, also calculate species-specific exposure.

4. Calculate a histogram of annual increment of deposition increase on habitat within areas receiving an increment greater than $0.005 \text{ kg-N ha}^{-1} \text{ year}^{-1}$, the Deposition Analysis Threshold value for Class 1 areas (NPS 2001, www2.nature.nps.gov/air/permits/flag/NSDATGuidance.htm).

5. Calculate the impact as a proportional increase over background levels multiplied by the habitat area affected. However, proportional impacts will be lower in high pollution zones where impacts may already be acute, and higher in low pollution areas. This point needs careful consideration, perhaps in the framework of Prevention of Significant Deterioration (PSD).

6. Apply a mitigation ratio (U.S. Fish & Wildlife Service has used 3:1) to the impact. Mitigation ratios are commonly used for off-site mitigation—if for example, the impact is estimated to be 1 hectare, then 3 hectares of mitigation land need to be secured.

III. Evaluate mitigation options

A. Land purchases

1. If suitable examples of impacted habitat-types of sensitive species are available, then attempt to buy sufficient habitat to meet mitigation ratio.

a) Areas close to the power plant site that are predicted to have higher deposition increments are preferable to those farther away.

b) The uncertainties of the real estate market, availability of appropriate habitat, and potentially small size of mitigation parcels are complicating factors, and alternatives to purchase (section III-B) could be considered.

B. Contribution to monitoring, management, restoration, and weed control in local reserves

1. Many established local reserves are in need of targeted management money for short- and long-term weed control. The provision of endowment money specifically for this purpose so that weed control can

be implemented over areas equal to or greater than the mitigation requirement.

2. Funding for restoration of habitats sufficient to cover the mitigation requirements may be considered.

C. Contribute to research on N-deposition effects and mitigation options in the region.

1. N-deposition is a complex process, and funding for targeted research (see research priorities, Section 5.4) may be lacking. Developing methods for monitoring N-deposition, effects on ecosystems, changes in biodiversity, and restoration of degraded habitats can add to capacity for mitigating impacts.

IV. Fund and institutionalize implementation

A. Develop a Property Analysis Report (PAR) for purchased land, establish an Inventory and Capital Phase, and set aside an endowment sufficient to implement long-term monitoring and adaptive management of target species and habitat.

1. Monitoring should adhere to high scientific standards, and adaptive management should include experimental scale evaluation of options.

B. If management monies are used for weed control and management on existing reserve lands, implement monitoring and documentation of the efforts that adhere to high scientific standards.

C. Require an annual report and meeting of stakeholders.

1. Field tours during the appropriate season are important to firsthand understanding of issues.

2. When possible, coordination with other local and regional conservation entities, and adjacent landowners should be pursued.

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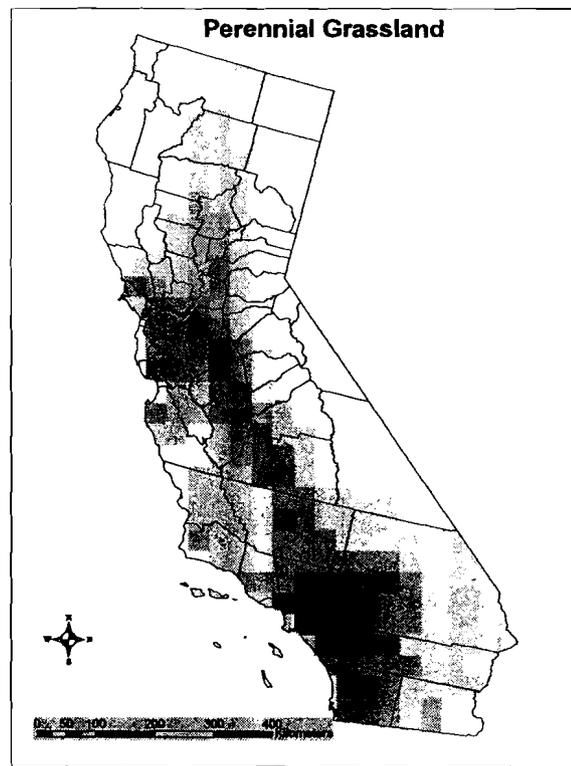
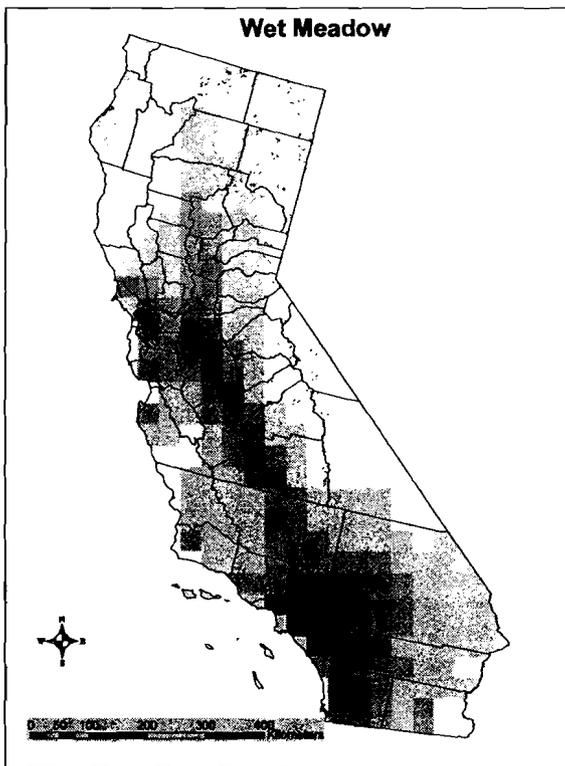
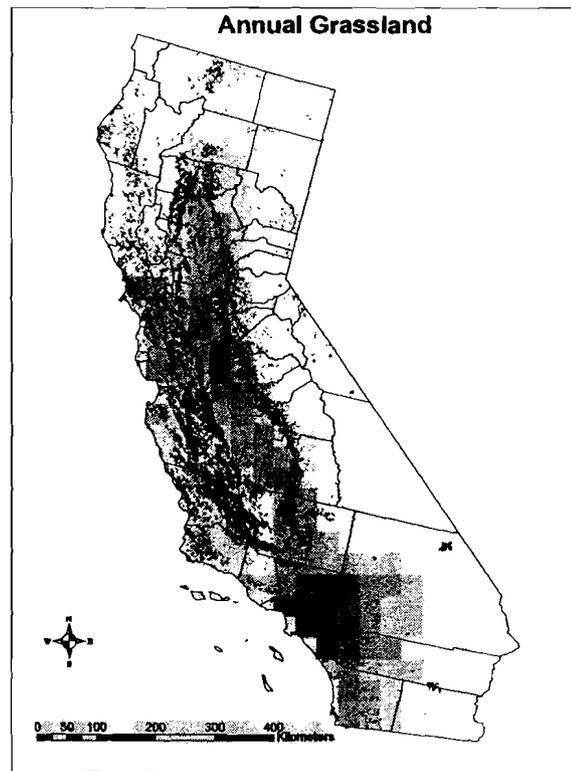
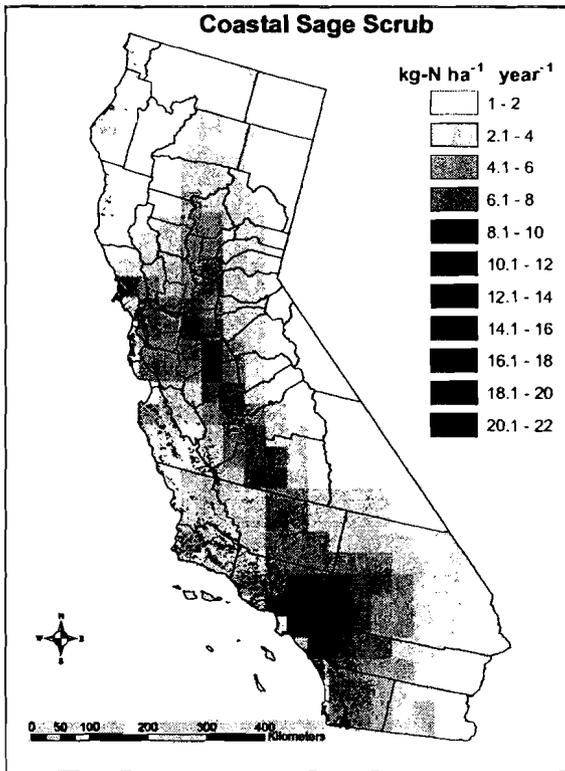
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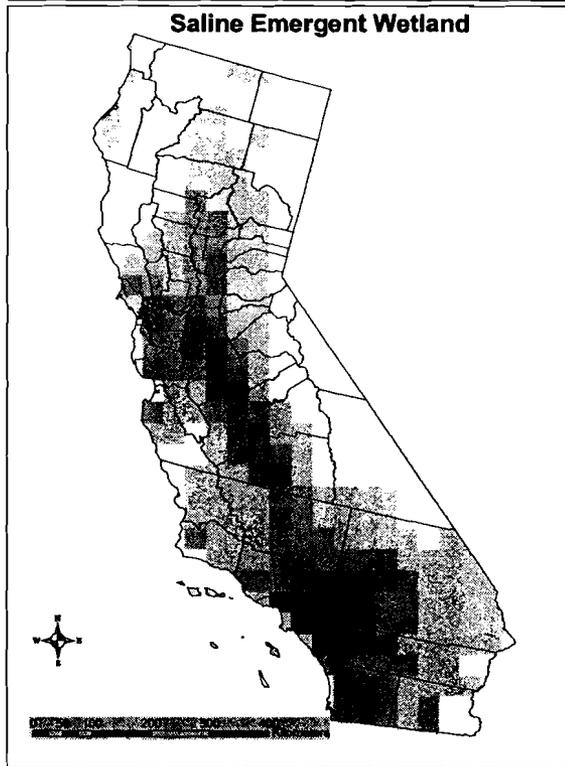
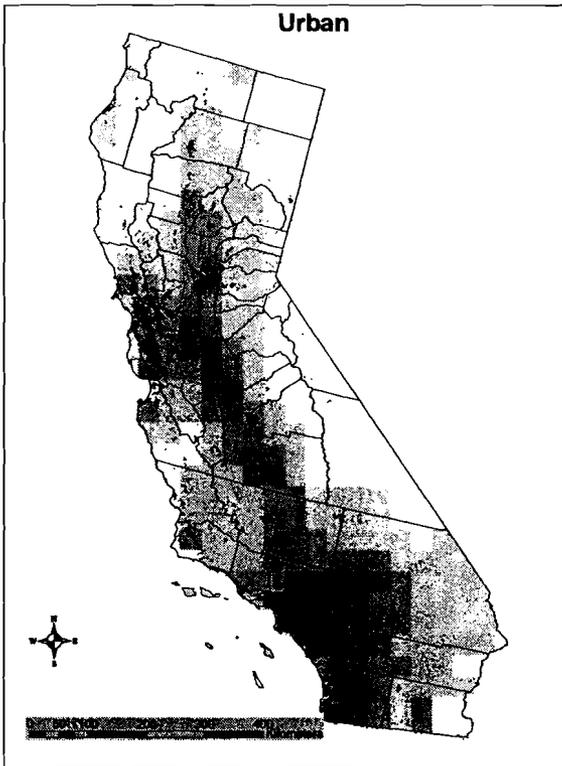
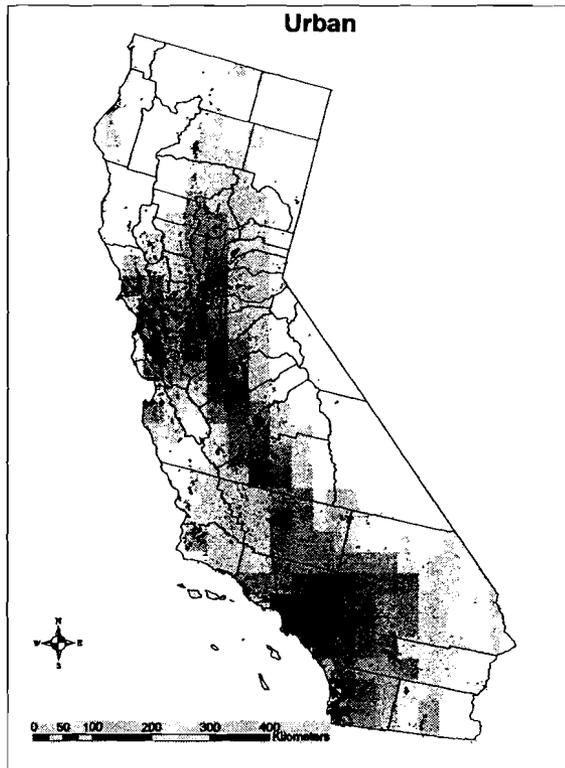
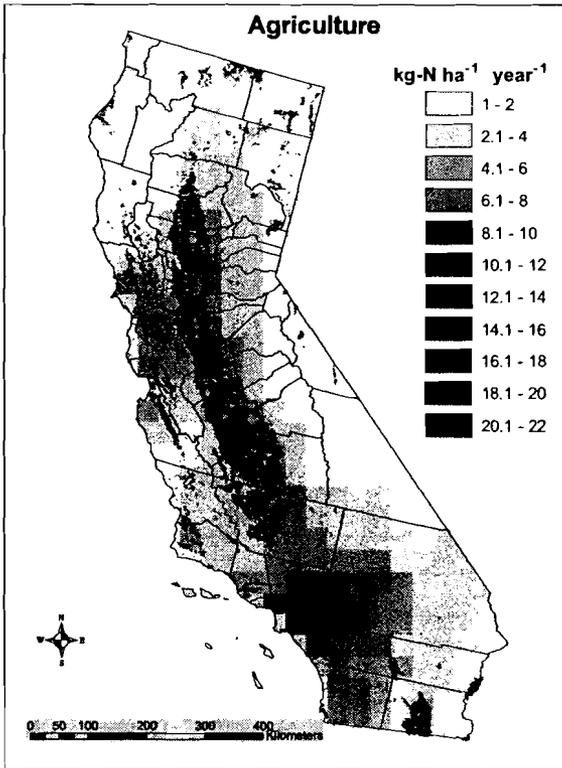
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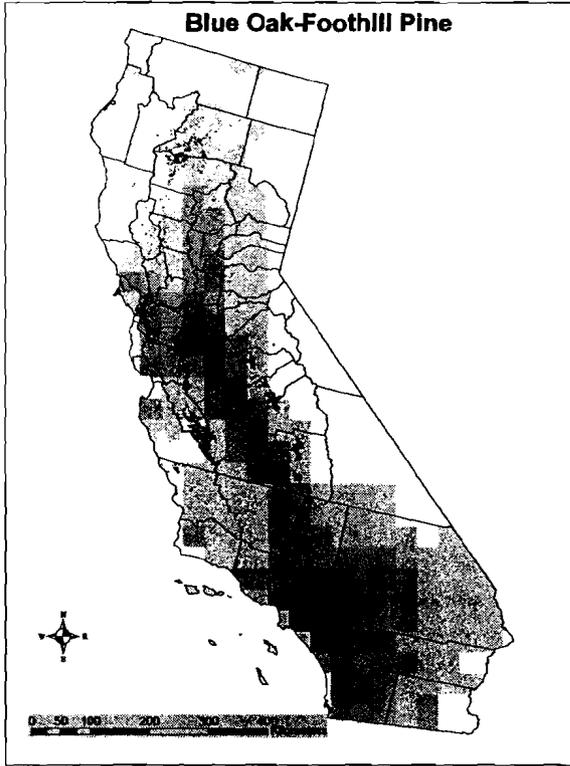
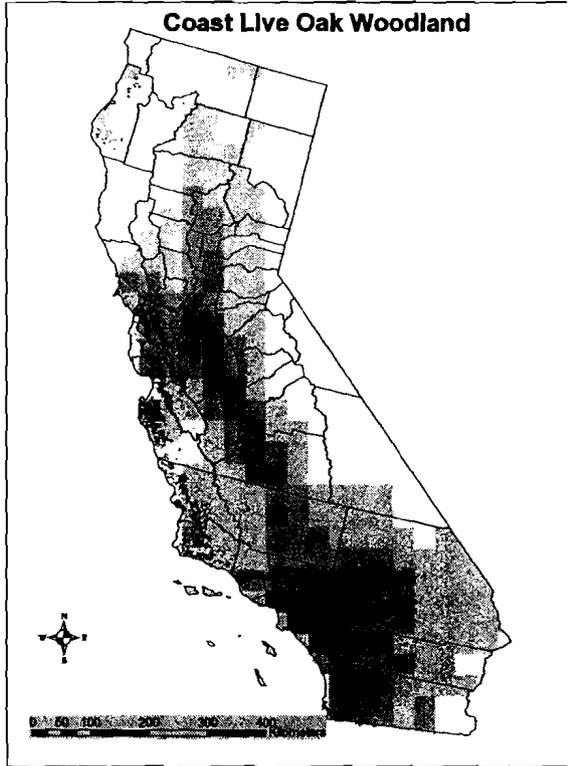
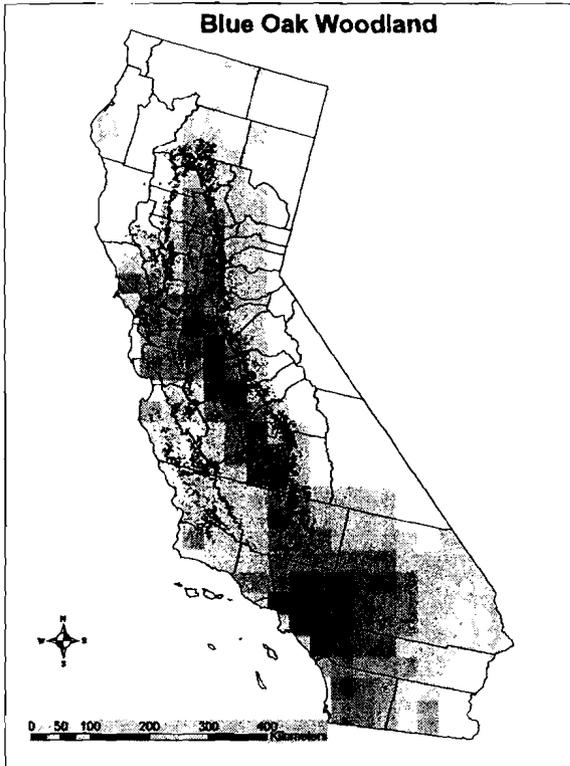
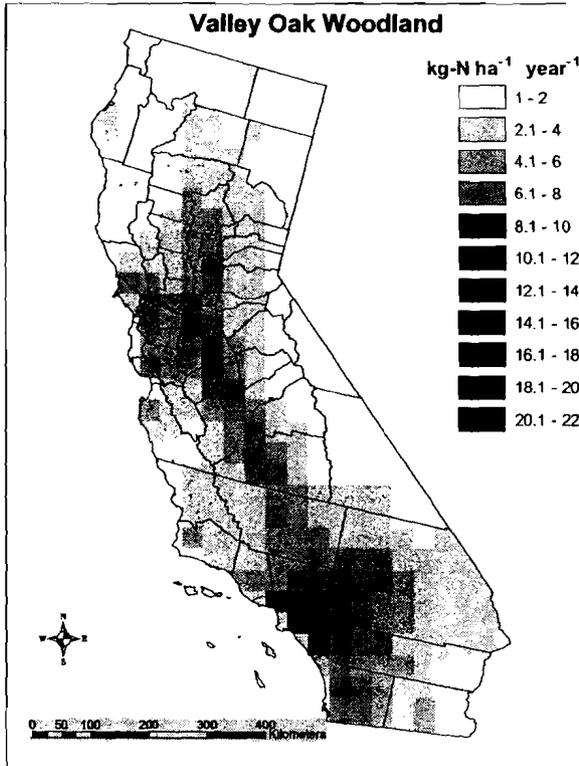
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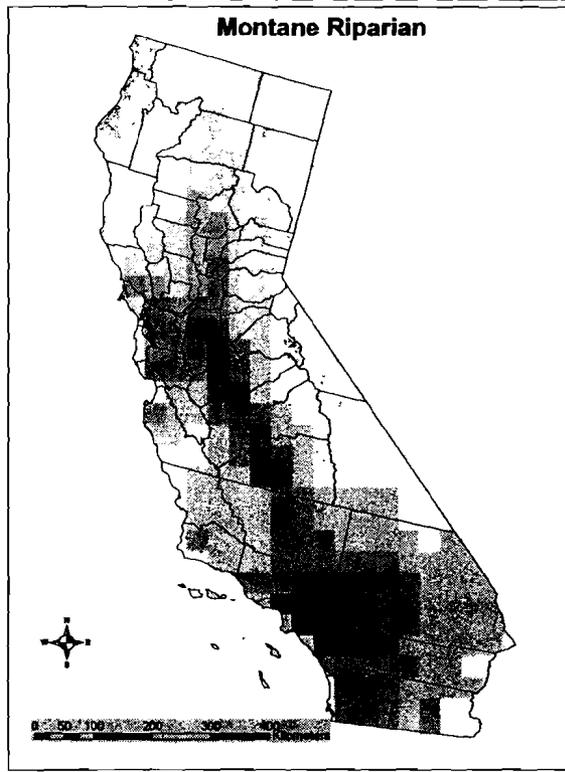
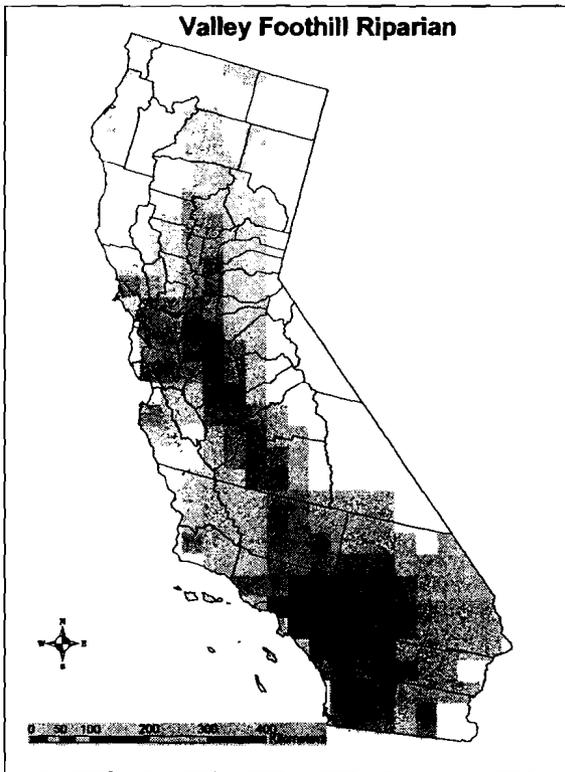
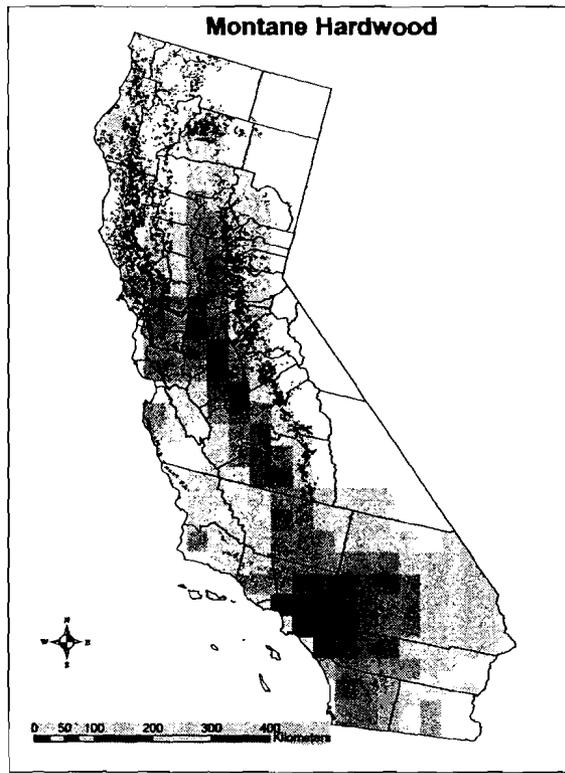
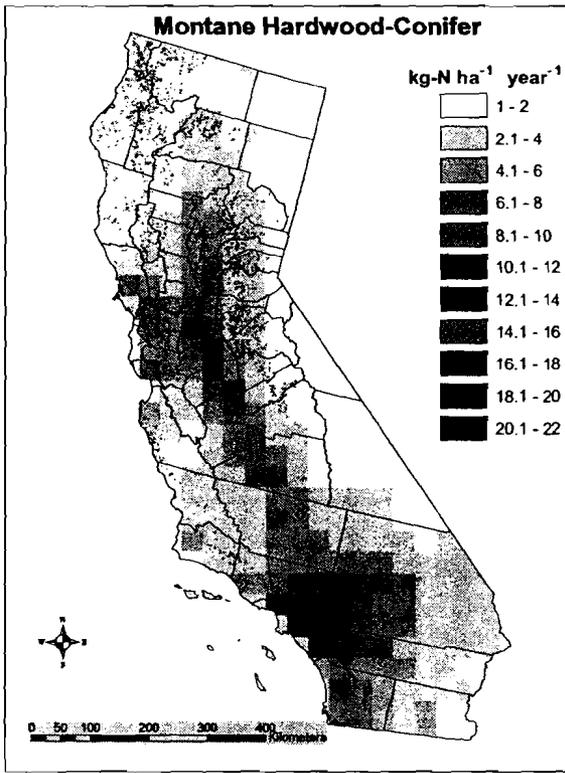
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|-------------------------------|--|
| BACT | best available control technology |
| CDF | cumulative distribution function |
| cryptobiotic | soil containing microbes that hold together the soil and reduce erosion |
| depolymerization | the breakdown of proteins into amino acids |
| edaphic | affected by the soil |
| eutrophic | nutrient-rich water bodies |
| forb | a non-woody, broadleaved wild plant, such as many wildflowers |
| gabbro | coarse-grained igneous rock |
| halophytes | plants that can live in a saline environment |
| HCP | Habitat Conservation Plan |
| herbivory | the process of animals eating plants |
| HNO ₃ | nitric acid |
| hypoxia | a low oxygen supply |
| lateritic | leached, clay rich soils |
| mycorrhizal fungi | symbiotic fungi attached to plant roots |
| N ₂ | Nitrogen |
| NCCP | Natural Communities Conservation Plan |
| net mineralization | the amount of NH ₄ ⁺ released from breakdown of organic matter |
| NH ₃ | ammonia |
| NH ₄ ⁺ | ammonium |
| nitrophilous | rich in nitrogen |
| nitrogen-fixing | the ability of a plant to fix atmospheric nitrogen into itself |
| NO | nitrogen oxide |
| NO ₂ | nitrogen dioxide |
| NO ₃ ⁻ | nitrate |
| N ₂ O | nitrous oxide |
| oligotrophic | water bodies that have low nutrient levels |
| PAN | peroxyacetyl nitrate |
| PM _{2.5} | particulate matter ≤ than 2.5 microns |
| PM ₁₀ | particulate matter ≤ than 10 microns |
| pNH ₄ ⁺ | particulate ammonium |
| pNO ₃ ⁻ | particulate nitrate |
| PON | particulate organic nitrogen |
| ppm | parts per million |
| reductase | an enzyme that reduces the substrate |
| sclerophyllous | tough evergreen leaves |
| SCR | selective catalytic reduction |
| SoCAB | South Coast Air Basin |
| stomata | pores on the underside of leaves |
| taxa | groups of organisms under comparison |
| T&E | threatened and endangered |
| xeric | characterized by a dry habitat |

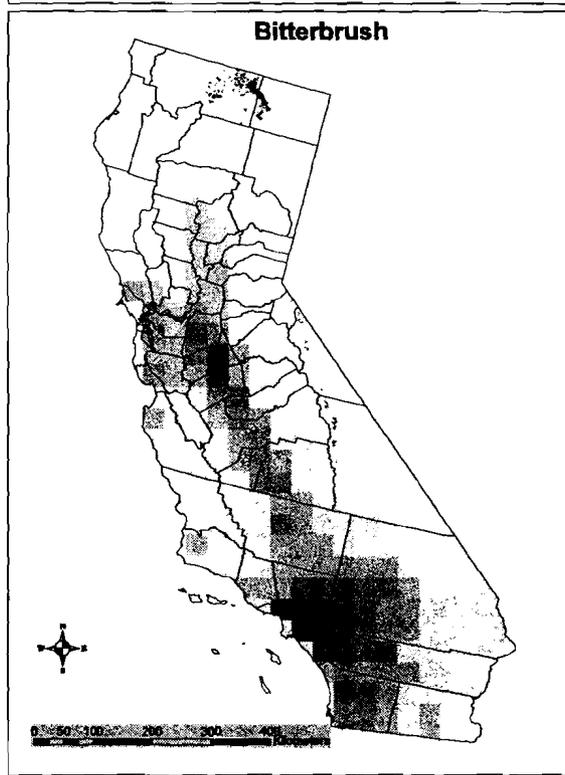
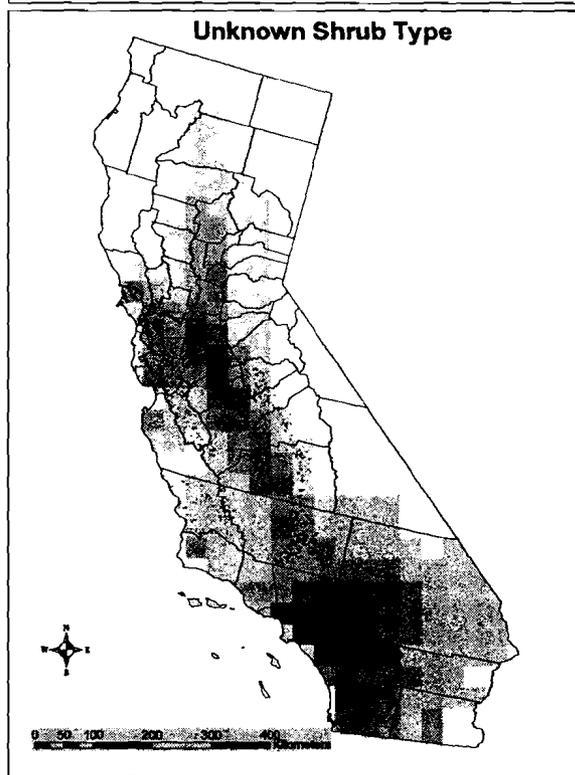
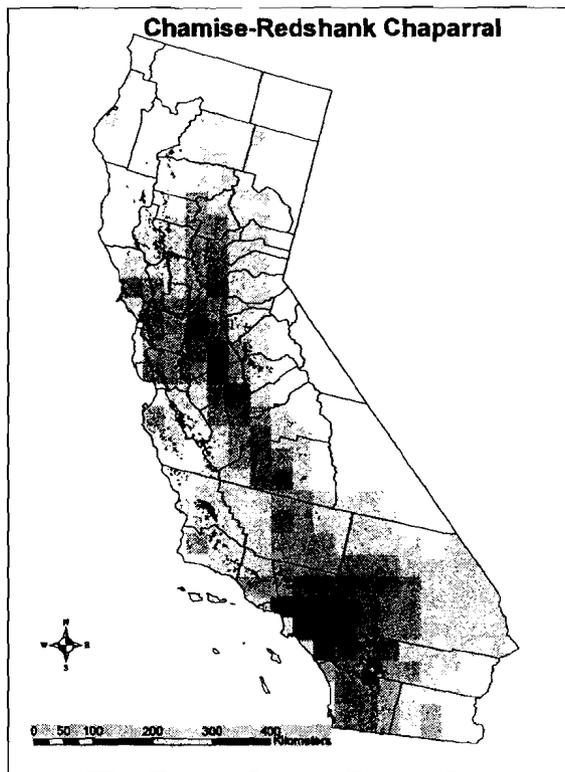
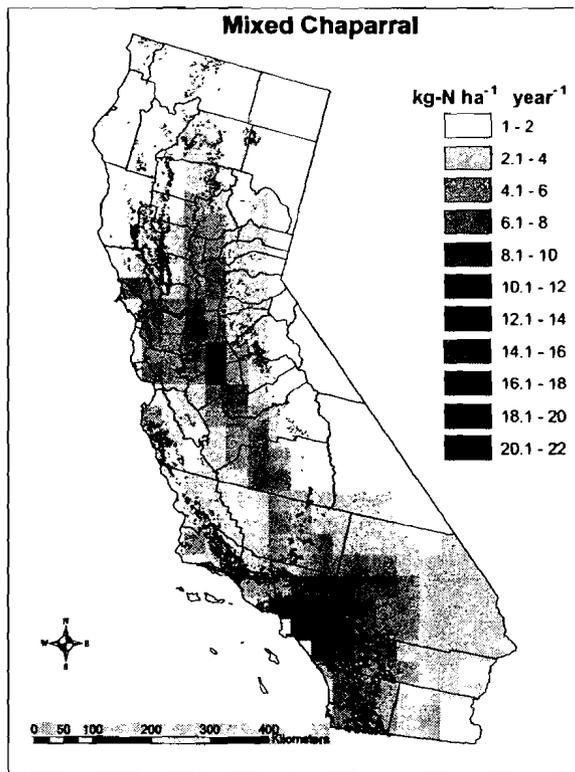
Appendix A
Maps of the 48 FRAP Vegetation Types Overlaid with
the CMAQ 36 km Deposition Maps

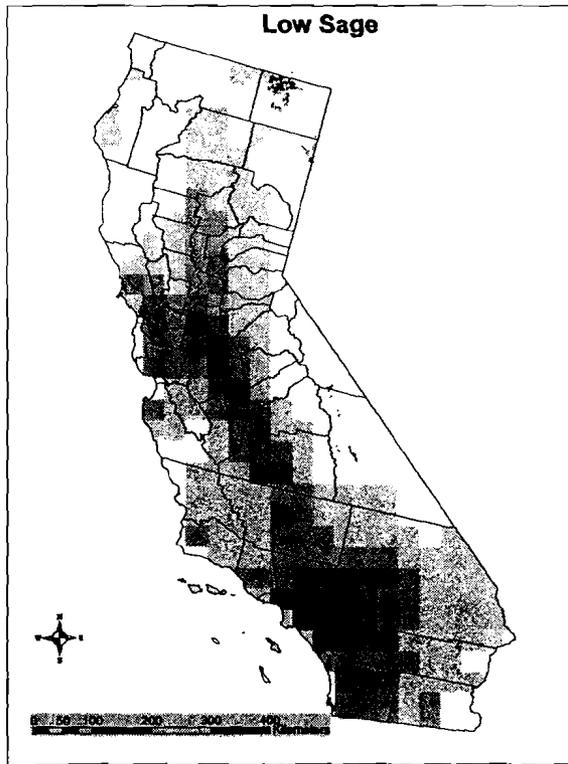
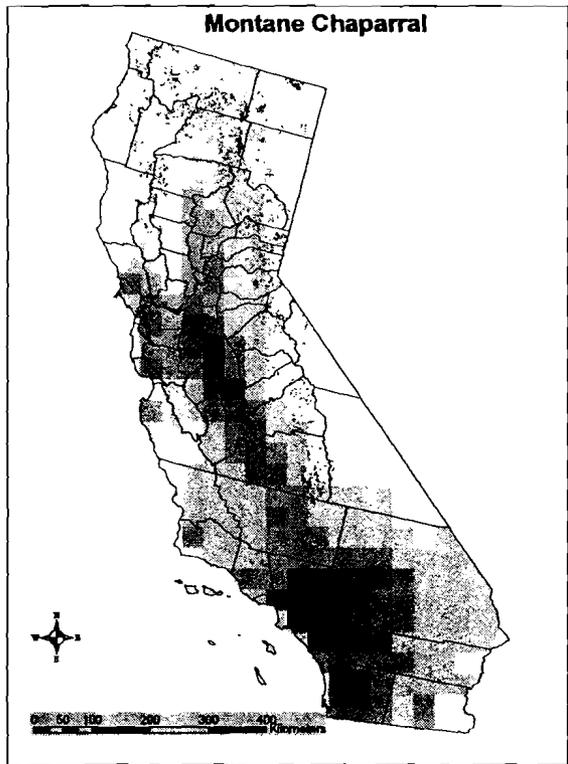
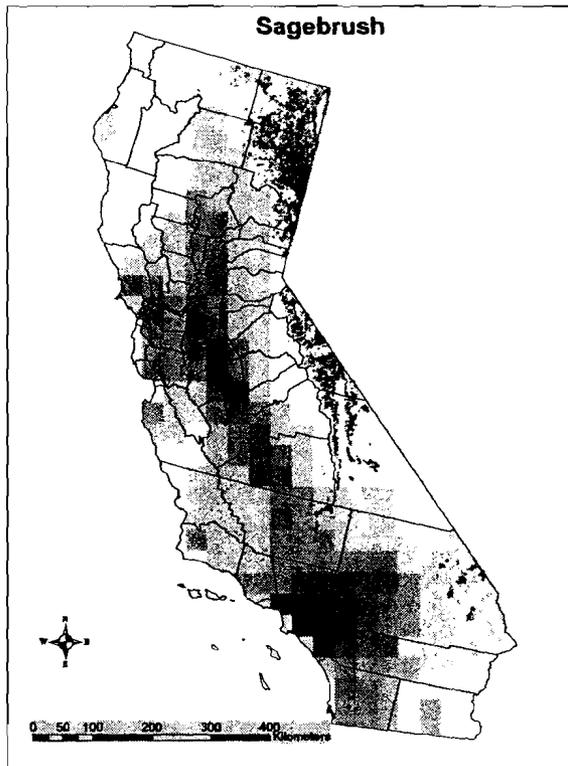
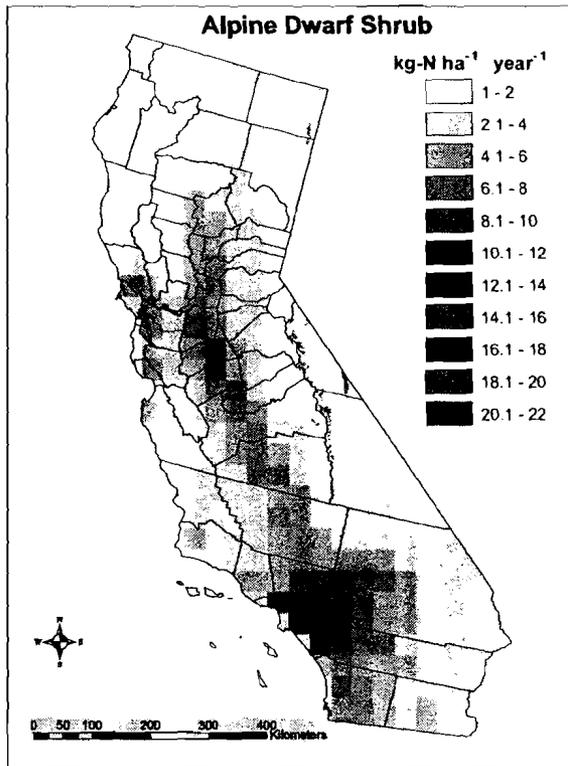


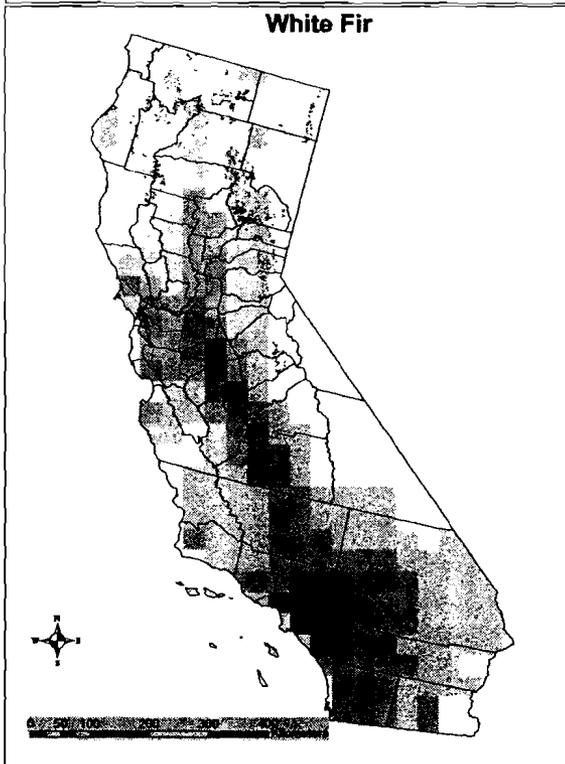
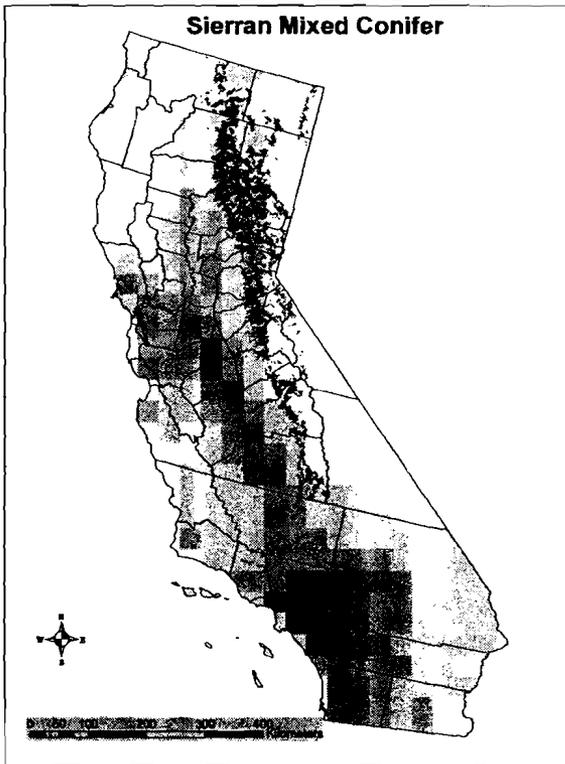
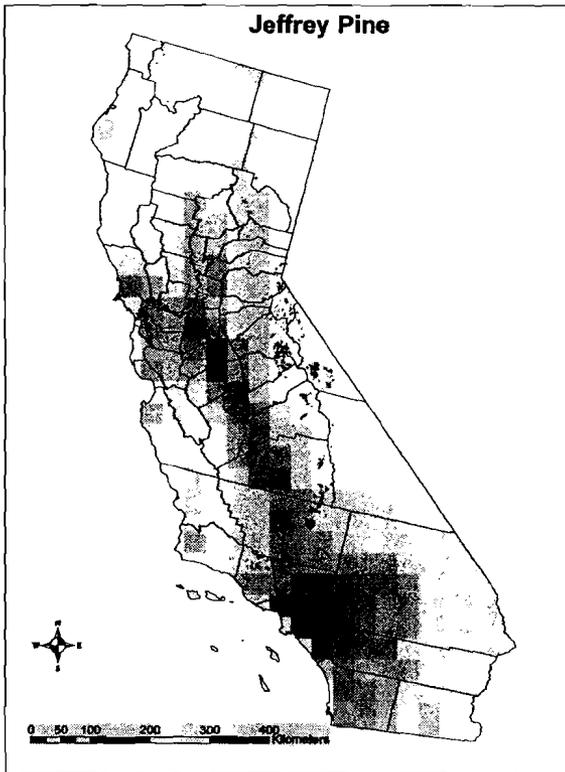
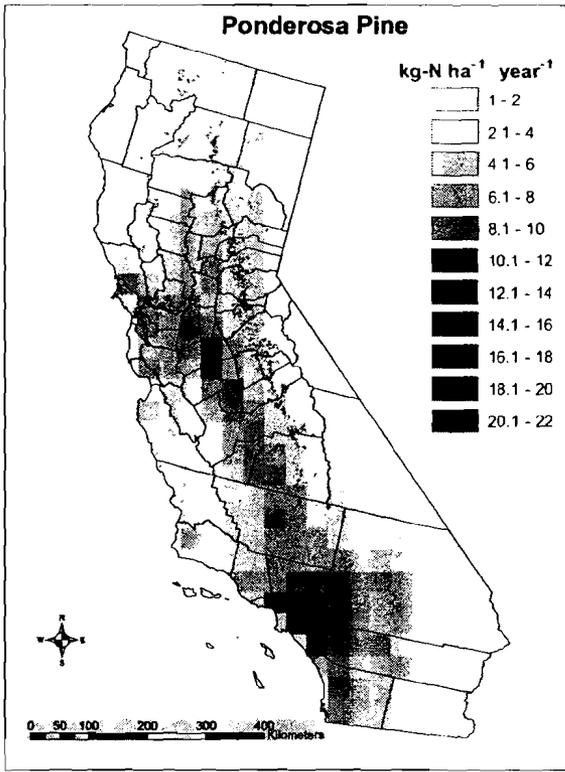


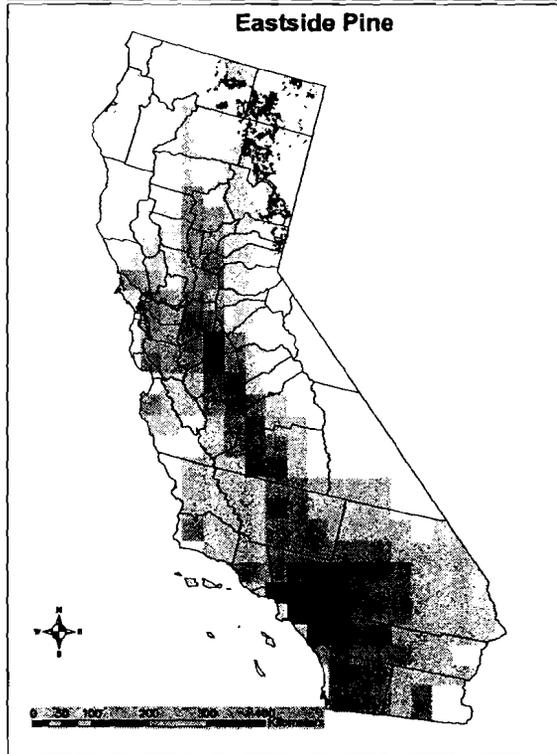
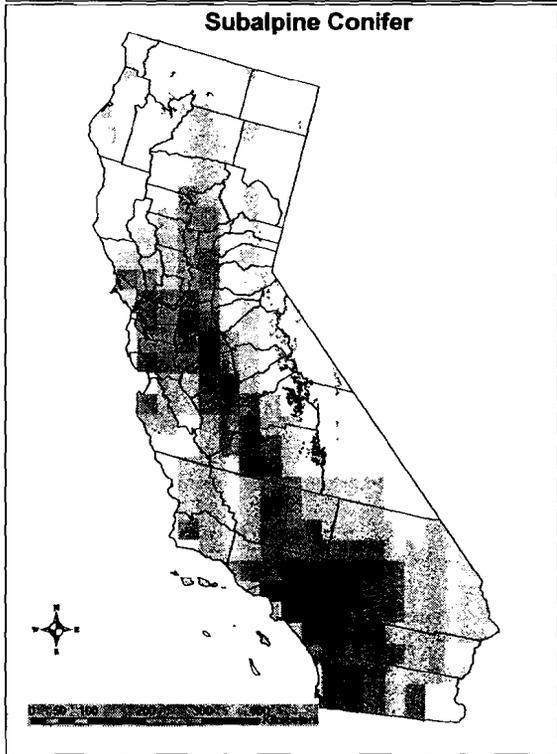
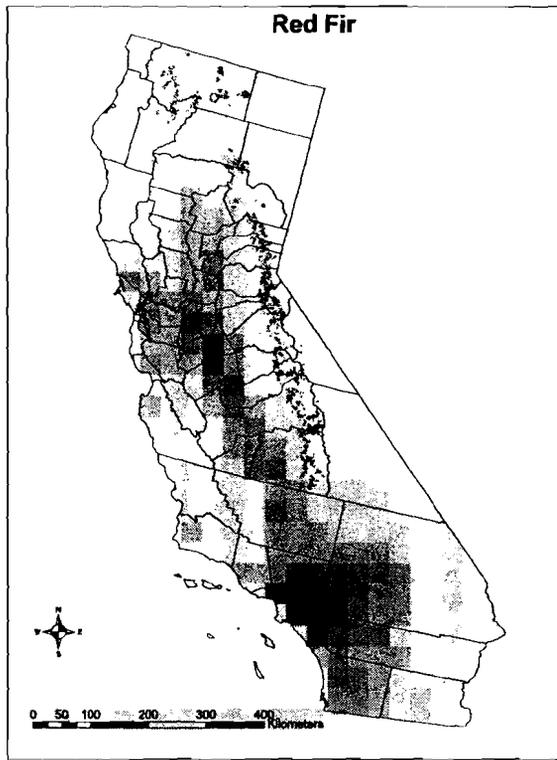
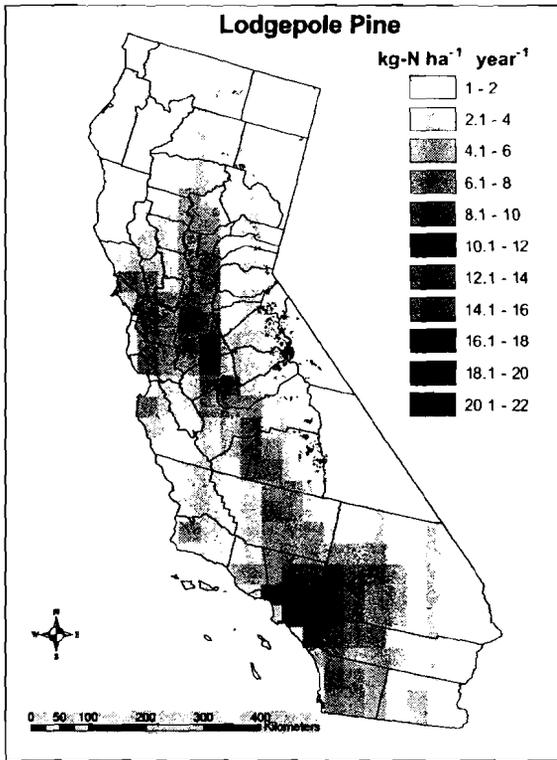


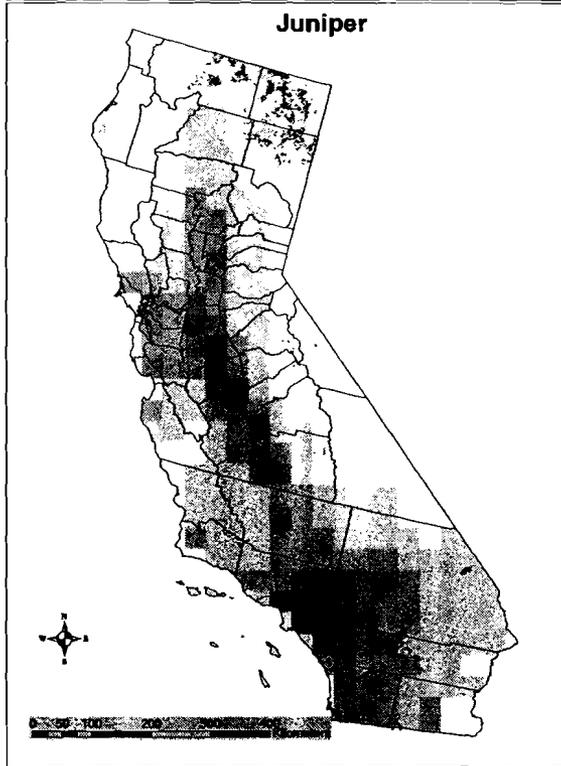
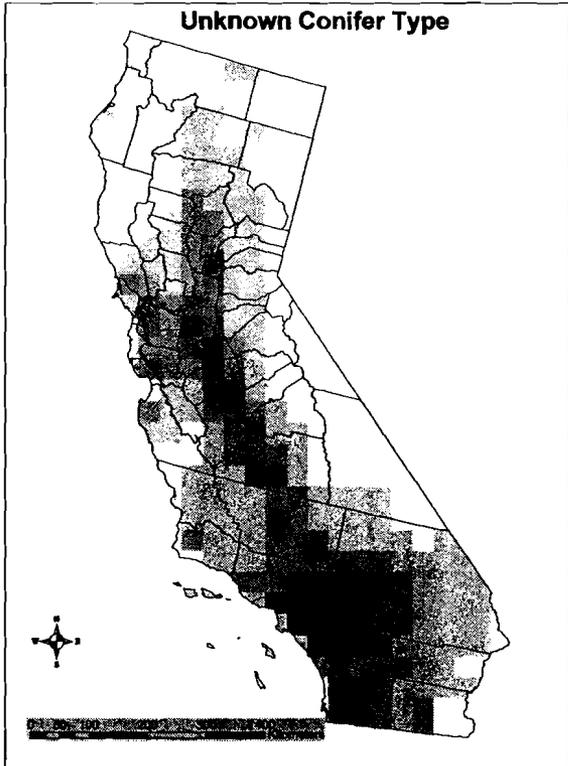
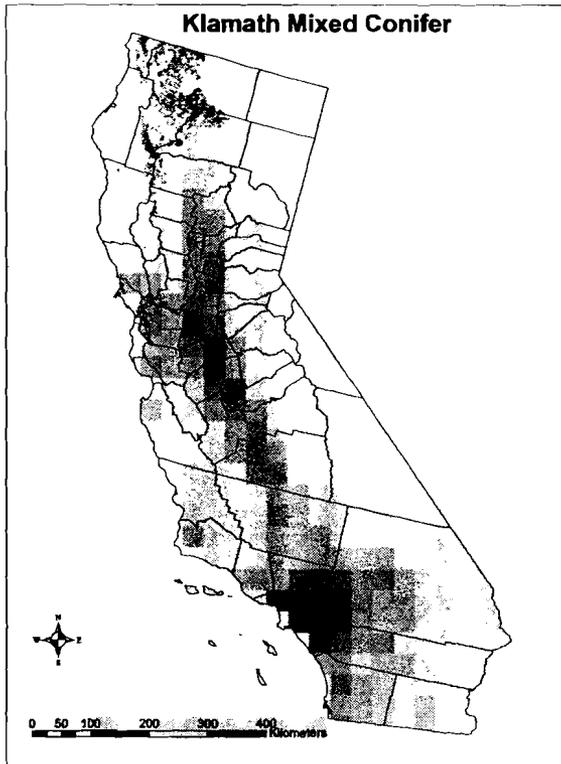
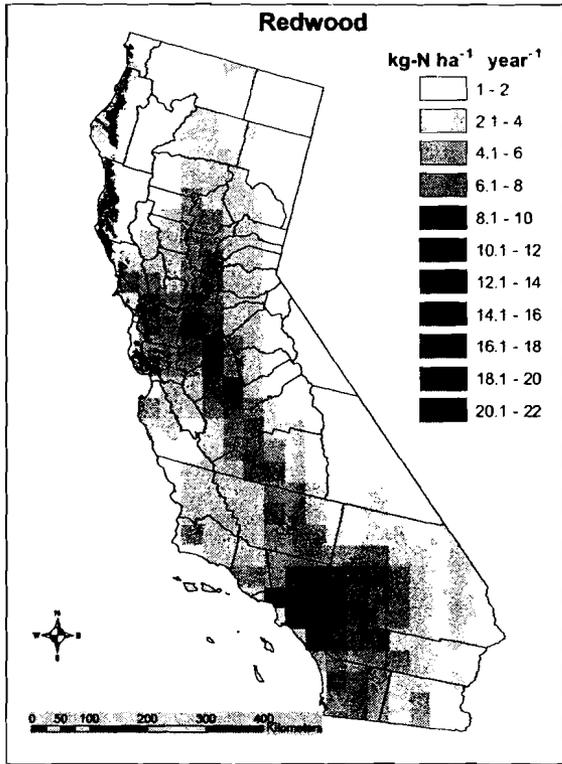


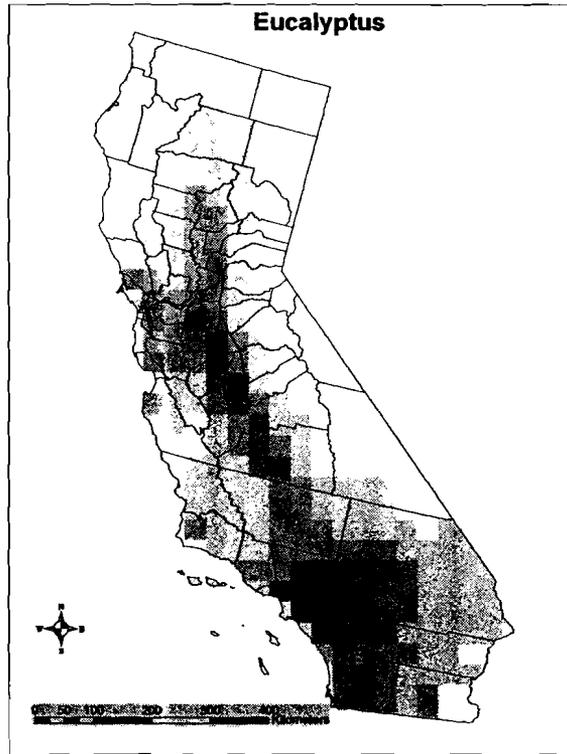
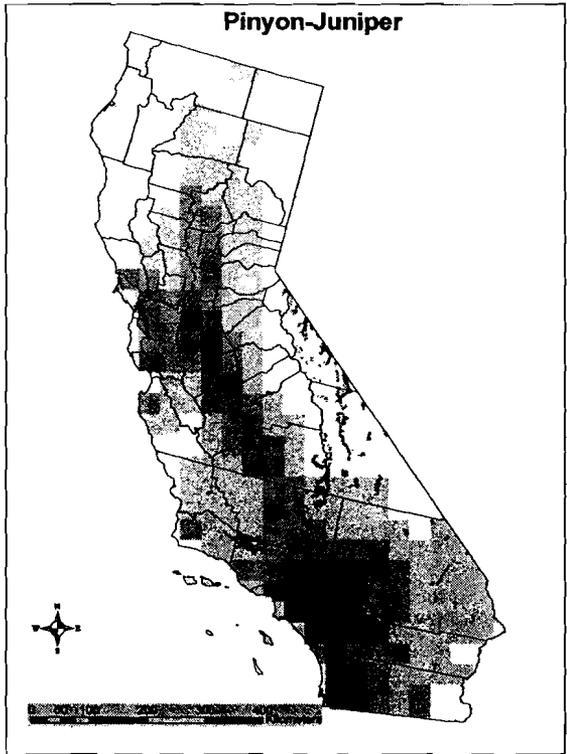
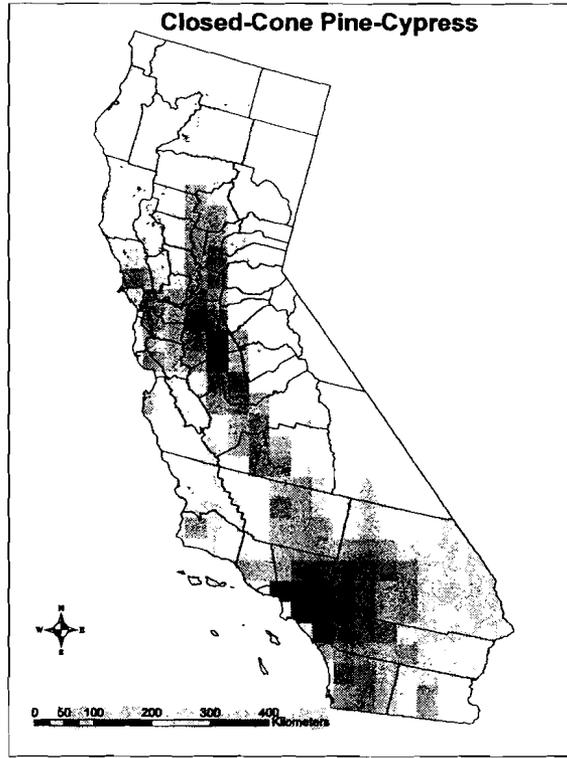
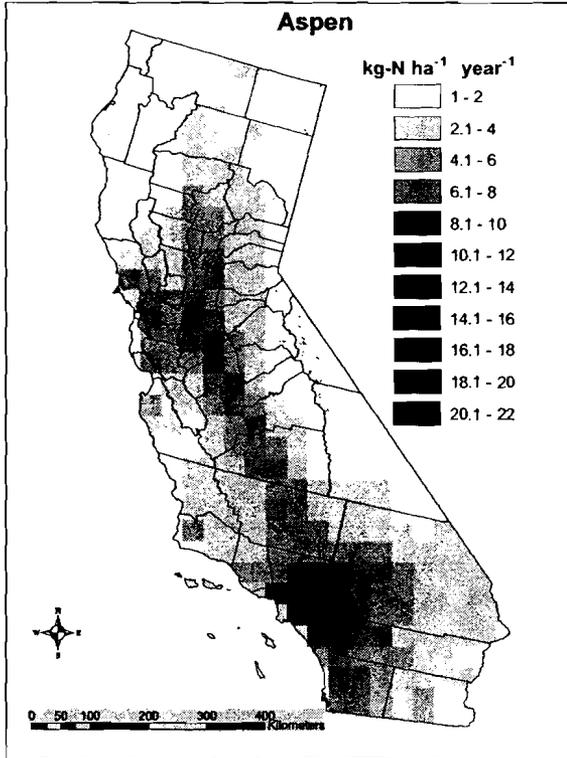


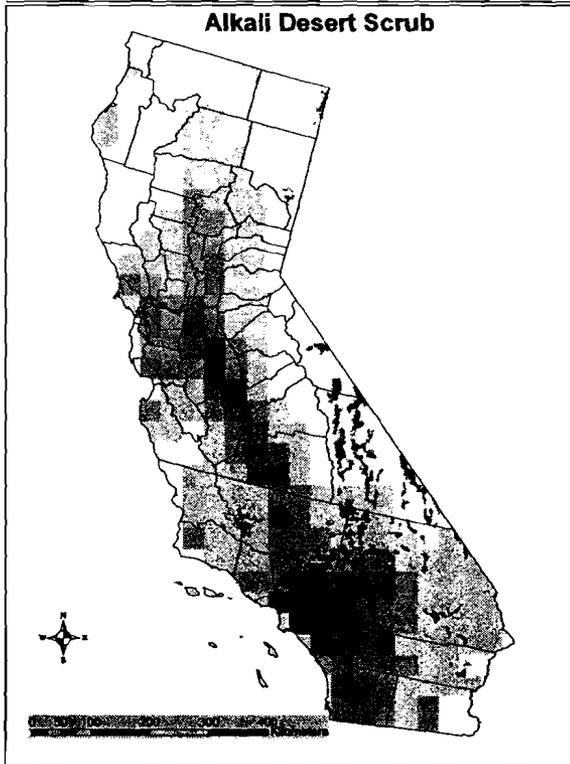
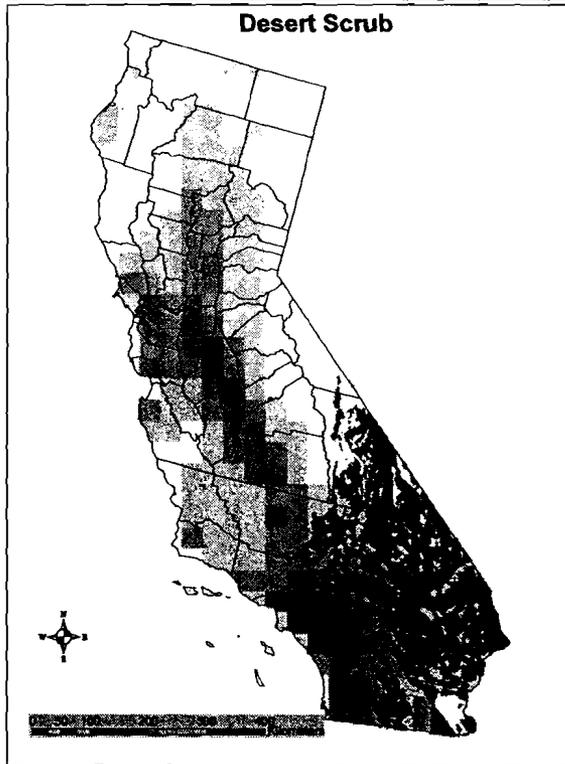
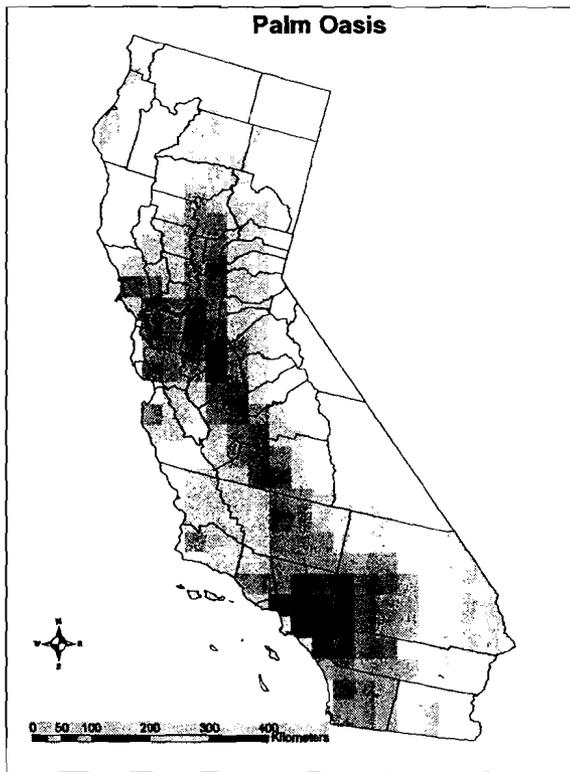
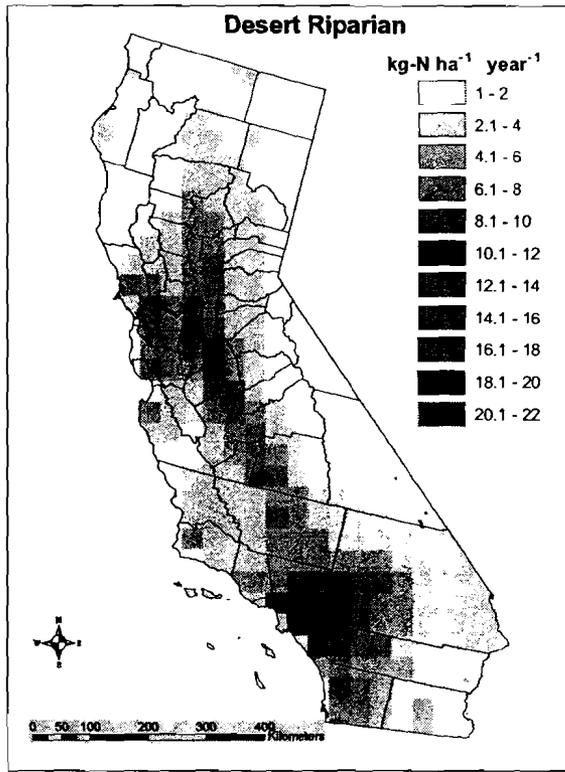


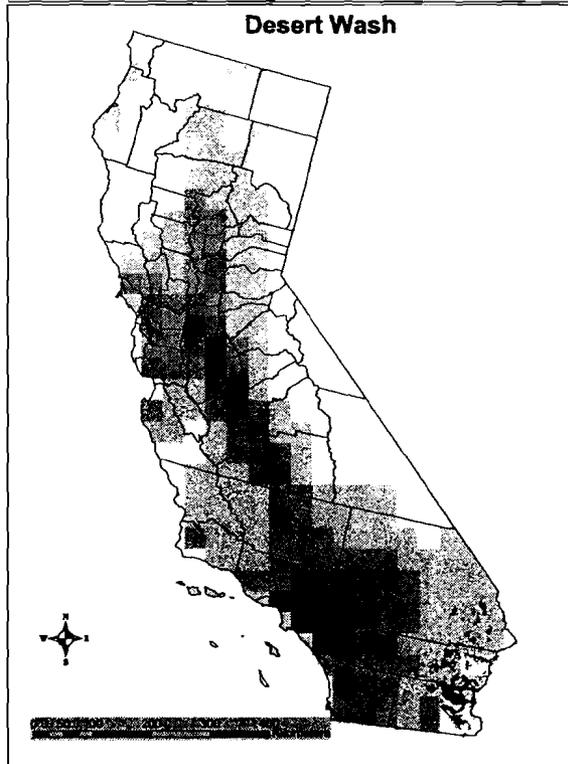
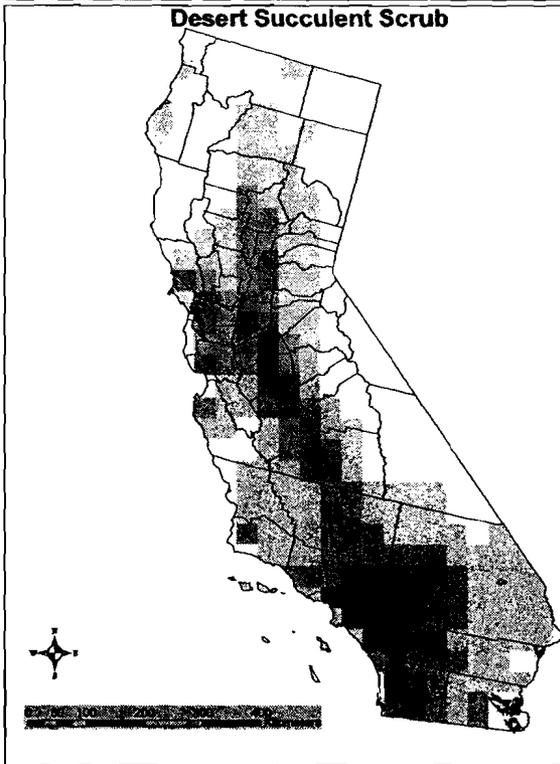
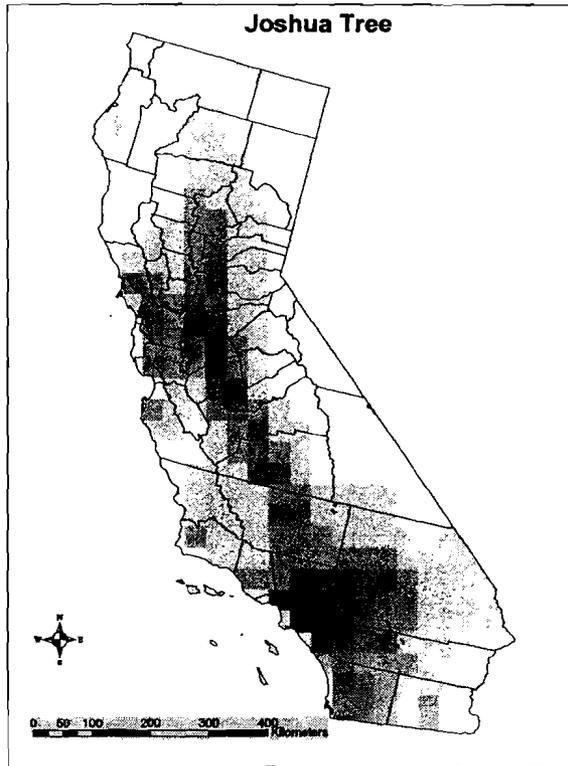
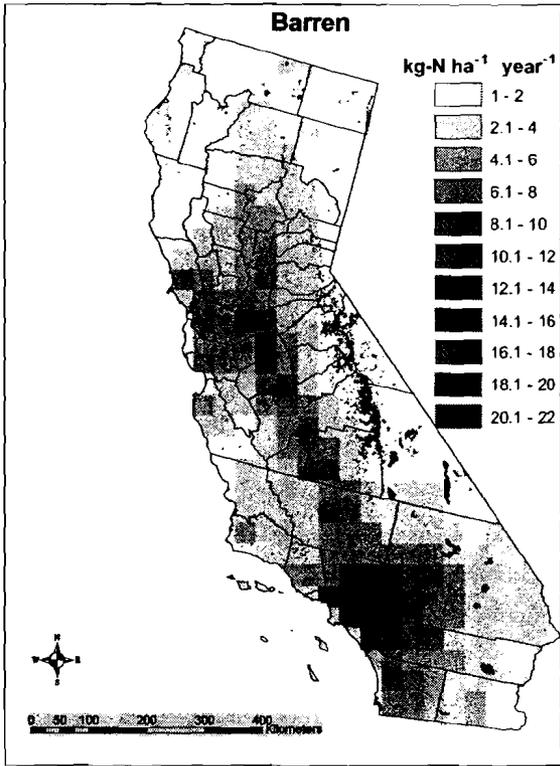












Appendix B

California Natural Diversity Data Base (CNDDDB) Plant and Animal Taxa List with N-deposition exposure

This Excel spreadsheet contains information from the California Natural Diversity Data Base (CNDDDB) and the 36 km CMAQ map. The codes for Fedlist and Statelist (columns G and H) are 1 = Endangered, 2 = Threatened, and 3 or more = Rare. Global and State rankings (columns N and O) are The Nature Conservancy classifications of status, and definitions can be found at the CNDDDB site. Nitrogen deposition exposure is in $\text{kg-N ha}^{-1} \text{yr}^{-1}$ (columns I [Mean], J [Max], and K [Min]). Threatened and Endangered status (column V) is inclusive of both state and federal lists.

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ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
PUBLIC HEALTH DEPARTMENT

David J. Kears, Director
Anthony Iron, Director & Health Officer

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Oakland, CA 94607

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**“RACE, CLASS, AND THE PATTERNS OF DISEASE DISTRIBUTION IN HAYWARD:
DECISION-MAKING THAT REINFORCES HEALTH INEQUITY”**

Testimony of Sandra Witt, DrPH, Director of Planning, Policy and Health Equity for the
Alameda County Public Health Department

My name is Dr. Sandra Witt, Deputy Director of Planning, Policy and Health Equity for the Alameda County Public Health Department. For the last 7 years, I have directed the Community Assessment, Planning, Evaluation and Education Unit of the Public Health Department. This Unit includes 8 epidemiologists and is responsible for monitoring the health status of all County residents. Over the past 3 years we have produced over 14 technical reports analyzing data from a variety of sources including mortality, births, hospitalizations, health survey data, communicable disease, and census data to identify broad areas of health concern and to monitor the health of our residents, particularly the most socially and economically vulnerable populations in our County. Several of these reports are cited as scientific evidence in the Eastshore Energy Center staff report.

“A condition of environmental justice exists when environmental risks and hazards and investments and benefits are equally distributed with a lack of discrimination, whether direct or indirect, at any jurisdictional level; and when access to environmental investments, benefits, and natural resources are equally distributed; and when access to information, participation in decision making, and access to justice in environment-related matters are enjoyed by all.”¹

In monitoring and analyzing health outcomes for Alameda County residents, one resounding theme stands out: poor health and premature death are by no means randomly distributed in Alameda County. Low-income communities and communities of color in certain specific geographic neighborhoods suffer from substantially worse health outcomes and die earlier. Studies reveal that these inequitable health outcomes are not adequately explained by genetics, access to health care, or risk behaviors, but instead are to a large extent the result of profoundly adverse social and environmental conditions. These adverse environmental conditions are too often an indelible reflection of the way decision-making power is shared with low-income communities.² Historical exclusion from decision-making venues has resulted in communities of

¹ European Workshop on Environmental Justice (Budapest, December 2003)

² Marmot MG and Wilkinson R, eds. 2003. *Social Determinants of Health: The Solid Facts, 2nd ed.* World Health Organization Regional Office for Europe, Copenhagen, Denmark.

Sampson, RJ. “The neighborhood context of well-being.” *Perspectives in Biology and Medicine*; Summer 2003; 46(3):S53.

color and low-income communities that are disproportionately burdened by an abundance of environmental hazards, including toxin-emitting power plants and other sources of noxious pollution. It is incumbent upon public health officials to analyze health data to validate pro-equity policies that will lower the disproportionate burden of pollution and improve health outcomes among all populations.

1. Illness and Death from Air Pollution Associated Conditions is Already Disproportionately Concentrated in the area of Hayward that is in Proximity to the Proposed Power Plant

An environmental justice framework requires examination of the specific impacts of the project on low-income communities and communities of color. In its cursory three-page Final Staff Assessment, the California Energy Commission (CEC) concludes that Eastshore Power Plant project will not contribute significantly to morbidity or mortality in any race or ethnic group residing in the project area, and therefore would not have a disproportional impact on an environmental justice population. However, this seemingly blythe conclusion neglects consideration of published and publicly-accessible Alameda County Public Health Department evidence of the geographic distribution of disease in the area of Hayward within proximity to the proposed power plant site.

In its environmental justice examination, the CEC staff also fail to reference any analysis of the existing burden of toxic pollution in the area of the proposed power plant site and thus effectively ignore the compounding effects of various sources of toxicity (including non-airborne sources) to which residents in the surrounding Hayward community are already exposed. When these two points are appropriately examined, as they are below, it becomes inescapably clear that by approving the Eastshore Power Plant at 25101 Clawiter Road, nearby predominantly low-income communities of color, disproportionately burdened by exposure to environmental toxicity and suffering from higher rates of premature death and chronic diseases known to be exacerbated by air pollution, the California Energy Commission is running the risk of exacerbating conditions that are fundamentally the legacy of discrimination.

• **Hayward is more ethnically diverse than Alameda County**

The City of Hayward is home to a significantly larger non-white population than Alameda County as a whole. Over one-third (34.2%) of Hayward residents are Latino compared to 19.0% countywide, and the proportion of Latino residents is even higher within a three-mile radius of the proposed plant (37.8%). Additionally, Hayward is comprised of 10.6% African Americans, 18.7% Asians, and 29.2% White. In Alameda County, Whites make up 40.9% of the population.

• **Within three miles of the proposed site are several high poverty, high minority, low life expectancy census block groups**

Overall, 10.0% of Hayward residents live in poverty, a slightly lower percentage than the 11.0% countywide. And within a three-mile radius of the proposed plant, 10.4% of residents live in poverty. However, within this three-mile radius, there are three low-income census block groups where at least 20% of residents live in poverty and 80% are non-white (see map in attachments).

The mortality rate within these three block groups was 50% higher in 1999-2001 than the rate of the remaining block groups in the three-mile radius of the proposed plant site: 1,328 per 100,000

compared to 865 per 100,000. In addition, the life expectancy at birth in these three block groups was 73.3 years, five years less than the 78.3 years observed countywide. These three low-income areas also receive a high level of Public Health Department services (see map in attachments).

- **Death rates from air-pollution associated diseases are substantially higher in the three mile radius around the proposed site**

There are numerous scientific studies that document the relationship between air pollution and human disease.³ Common acute non-cancer health effects include asthma, chronic obstructive pulmonary disease, and cardiovascular disease, particularly congestive heart failure. The exacerbation of these existing chronic conditions result in unnecessary morbidity, missed work days, preventable hospitalizations, and premature death. A disproportionate burden of the cost of these preventable hospitalizations, particularly among the uninsured, is borne by Alameda County government.

In order to examine mortality from specific causes, death rates within the three-mile radius around the proposed site were compared to Alameda County rates (combining the low-income block groups with the other block groups in the radius). Rates of death from all causes, coronary heart disease, and chronic lower respiratory disease were all significantly higher within the three-mile radius than those rates for Alameda County, representing an ongoing excess burden of mortality (see attached tables).

The rate of death from all causes within the three-mile radius was 888.4 per 100,000 from 1999 to 2001, statistically significantly higher than the county rate of 792.3 per 100,000. Similarly, the rate of death from chronic lower respiratory diseases was 54.8 per 100,000 within the three-mile radius, significantly higher (by 43%) than the county rate of 38.4. And finally, the coronary heart disease death rate was 216.4 per 100,000 within the three-mile radius, also significantly higher than the county rate of 185.7 per 100,000.

- **Hospitalization due to air pollution associated diseases is substantially higher in the zip codes close to the proposed site**

In order to examine measures of illness (morbidity as opposed to mortality) in the area of the proposed plant, rates of hospitalization for specific diseases in the combined zip codes, 94544 and 94545, were compared to Alameda County rates. From 2003 to 2005, the hospitalization rate for coronary heart disease in the two zip codes was 810.4 per 100,000 people, 60% higher than the county rate of 507.5 per 100,000. Similarly, the rate of chronic obstructive pulmonary disease

³ Epidemiology of chronic obstructive pulmonary disease: health effects of air pollution. Viegi G, Maio S, Pistelli F, Baldacci S, Carrozzi L, *Respirology*. 2006 Sep;11(5):523-32.

Particulate air pollution and hospital admissions for congestive heart failure in seven United States cities. Wellenius GA, Schwartz J, Mittleman MA. *Am J Cardiol*. 2006 Feb 1;97(3):404-8.

Identifying subgroups of the general population that may be susceptible to short-term increases in particulate air pollution: a time-series study in Montreal, Quebec. Goldberg MS, Bailar JC 3rd, Burnett RT, Brook JR, Tamblin R, Bonvalot Y, Ernst P, Flegel KM, Singh RK, Valois MF. *Res Rep Health Eff Inst*. 2000 Oct;(97):7-113; discussion 115-20.

Identification of persons with cardiorespiratory conditions who are at risk of dying from the acute effects of ambient air particles. Goldberg MS, Burnett RT, Bailar JC 3rd, Tamblin R, Ernst P, Flegel K, Brook J, Bonvalot Y, Singh R, Valois MF, Vincent R. *Environ Health Perspect*. 2001 Aug;109 Suppl 4:487-94

(COPD) hospitalization was 316.2 per 100,000 in the two zip codes, 20% higher than the county rate of 264.3. For congestive heart failure the hospitalization rate in the two zip codes was 397.7 per 100,000, 35% higher than the county rate of 295.3. Finally, the asthma hospitalization rate was 179.8 per 100,000, 14% higher than the county rate of 157.3.

All of these differences between the area of the proposed site and Alameda County as a background or reference were found to be statistically significant, which means they did not occur by chance. Based on Census 2000, the population of the two zip codes, as well as Hayward, had an age composition very similar to that for Alameda County—about one-fourth of the population was under age 18 and ten percent was over age 65. Thus the fact that rates of illnesses due to respiratory and circulatory system diseases (most often diseases of the elderly) are significantly higher in the proposed plant area than in the rest of the county suggests a level of vulnerability in this population that is not explained by age.

An environmental justice approach requires an analysis of the relative burden of disease in the population most directly affected by the decision to site this power plant. The presence of a disproportionate concentration of persons with asthma, chronic lung disease, congestive heart failure, and other chronic conditions that are exacerbated by air pollution must factor into the decision of where to site this power plant. These populations are the actual “sensitive receptors” referred to in the *Air Toxics Hot Spots Program Risk Assessment Guidelines*.² They are not distributed through the population randomly but instead are concentrated disproportionately in proximity to the proposed Hayward site. Siting the Eastshore Power Plant in Hayward will disproportionately impact a geographic area not only home to a comparatively high non-white population, but also already burdened by existing poor health outcomes.

2. The CEC environmental justice analysis does not adequately factor in the uneven distribution of exposure to various sources of toxicity in the area in proximity to the proposed power plant site

In its environmental justice examination, the CEC staff fail to reference any analysis of the existing burden of toxic pollution in the area of the proposed power plant site and effectively ignore the compounding effects of various sources of toxicity (including non-airborne sources) to which residents in the surrounding Hayward community are already exposed. CEC staff rely on established risk assessment models to predict health impacts from the proposed power plant. However, there is substantial uncertainty associated with the process of risk assessment. The uncertainty arises from lack of “real world” data in many areas necessitating a heavy reliance upon experimental animal models and a set of basic assumptions. Among the key assumptions underlying the health risk assessment are⁴:

1. Human toxicity from air pollution is additive rather than synergistic.
2. Animal toxicity data can be readily extrapolated to humans.

• Human disease due to exposure to multiple toxic pollutants may be synergistic

⁴ Air Toxics Hot Spots Program Risk Assessment Guidelines. *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. August 2003. California EPA.

The potential for multiple and varied air pollutants to act synergistically, rather than additively as assumed by the CEC health risk assessment, requires that an analysis of the overall toxic burden associated with this Hayward location be performed. Low-income minority populations have historically been exposed to a much higher burden of environmental toxicity. The brief CEC environmental justice analysis does not quantify or otherwise assess the cumulative burden of toxicity in the vicinity of the proposed site.

- **Animal toxicity data may be a poor proxy for human health effects**

There are very few in vivo studies that are designed to establish a safe threshold for human exposure to air pollution, in fact, a recent study by Harvard cardiovascular researchers looking at seven U.S. cities documents a direct association between particulate air pollution and acute hospitalizations for congestive heart failures.⁵ *This effect is seen below the current levels set by US EPA.* Relative exposure limits established in animal models must be interpreted with a great deal of caution when deciding whether new sources of pollution should be sited in low income minority communities.

- **Detailed, publicly available and published data exists with which CEC staff could conduct a more complete and appropriate environmental justice analysis**

Alameda County Public Health Department maintains and publishes detailed age- and race-specific geographic morbidity and mortality data on asthma, chronic obstructive pulmonary disease, cardiovascular disease, and lung cancer for the county, the city of Hayward and for smaller geographic areas including zip code and census tract. CEC staff did not contact Alameda County Public Health Department to obtain critical data on chronic obstructive pulmonary disease, cardiovascular disease, or congestive heart failure. CEC staff did cite Alameda County Public Health Department data on asthma in its public health section, however, the CEC staff report ignores data related to these other serious respiratory and cardiovascular conditions that are known to be associated with ambient air pollution and help more fully characterize the vulnerability of the population residing in the shadow of this proposed site.

“An environmental injustice exists when members of disadvantaged, ethnic, minority or other groups suffer disproportionately at the local, regional (sub-national), or national levels from environmental risks or hazards, and/or suffer disproportionately from violations of fundamental human rights as a result of environmental factors, and/or denied access to environmental investments, benefits, and/or natural resources, and/or are denied access to information; and/or participation in decision making; and/or access to justice in environment-related matters.”⁶ The CEC staff analysis largely ignores profoundly important questions of environmental justice and in so doing contributes to the unfortunate and widely repudiated legacy of racial and class-based discrimination that continues to shape the pattern and burden of disease that compromise the quality of life of residents in the vicinity of the proposed power plant site. Alameda County Public Health Department strongly opposes decision-making based on such an inadequate analysis of critical environmental justice considerations.

⁵ Particulate air pollution and hospital admissions for congestive heart failure in seven United States cities. Wellenius GA, Schwartz J, Mittleman MA. *Am J Cardiol.* 2006 Feb 1;97(3):404-8.

⁶ European Workshop on Environmental Justice (Budapest, December 2003)

Attachments

**Mortality rates, 1999-2001
Within a 3-mile radius of proposed site with Alameda County comparisons**

| Cause of Death | Area | 3-Yr Count | Rate** |
|-----------------------------------|----------------|------------|---------|
| All Causes | 3 Mile Radius | 2,492 | 888.4 * |
| | Alameda County | 29,525 | 792.3 |
| Chronic Lower Respiratory Disease | 3 Mile Radius | 155 | 54.8 * |
| | Alameda County | 1,387 | 38.4 |
| Coronary Heart Disease | 3 Mile Radius | 589 | 216.4 * |
| | Alameda County | 6,769 | 185.7 |

*Statistically significant difference at the $p \leq .05$ level.

**Rates are age adjusted by the direct method to the 2000 US standard population.

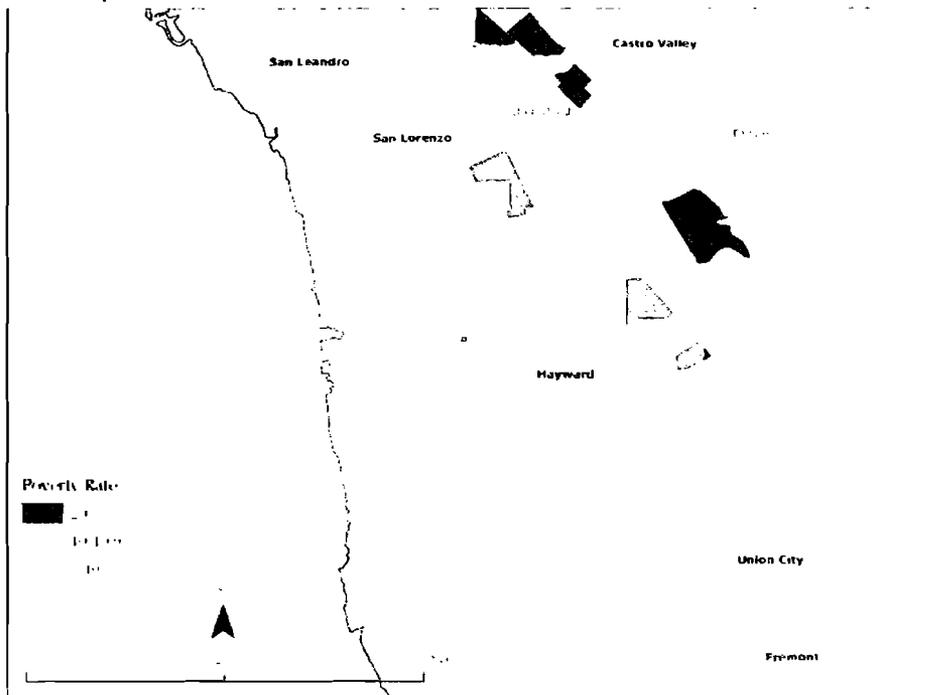
**Hospitalization Rates, 2003-2005
94544 and 94545 combined with Alameda County comparisons**

| Primary Diagnosis | Area | 3-Yr Count | Rate** |
|---------------------------------------|----------------|------------|---------|
| Coronary Heart Disease | 94544 & 94545 | 2,133 | 810.4 * |
| | Alameda County | 20,780 | 507.5 |
| Chronic Obstructive Pulmonary Disease | 94544 & 94545 | 891 | 316.2 * |
| | Alameda County | 11,116 | 264.3 |
| Congestive Heart Failure | 94544 & 94545 | 1,024 | 397.7 * |
| | Alameda County | 11,914 | 295.3 |
| Asthma | 94544 & 94545 | 531 | 179.8 * |
| | Alameda County | 6,792 | 157.3 |

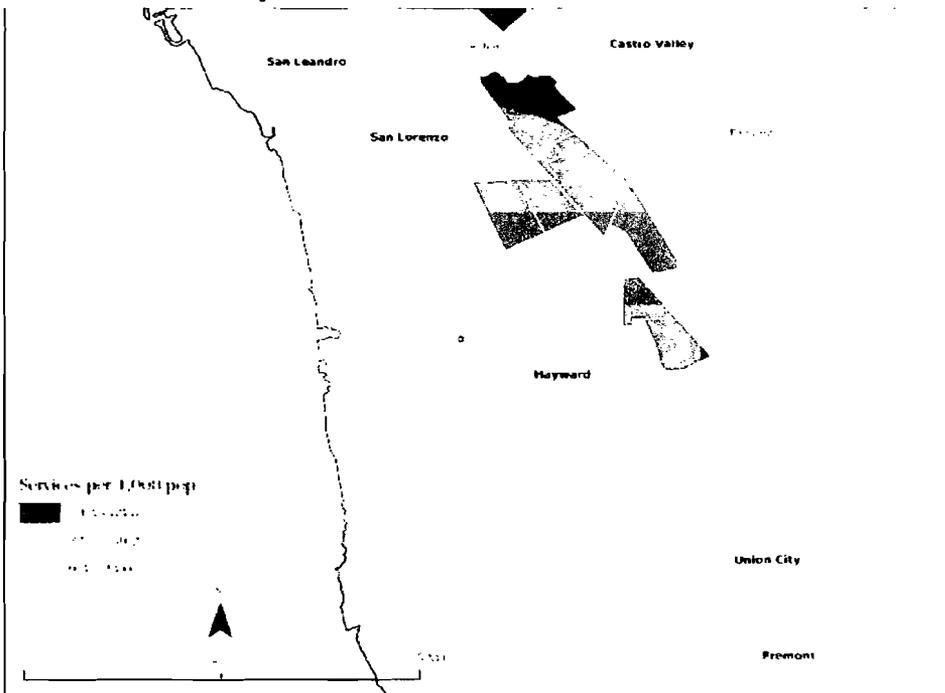
*Statistically significant difference at the $p \leq .05$ level.

**Rates are age adjusted by the direct method to the 2000 US standard population.

Poverty Rate



Public Health Department Service Rate





Description:

Plot 1
Predicted Sound Contours (dBA)
of Attenuated Baseline Plant
Operating at Base Load

Project:

Russell City Energy Center

Drawing Number:

RCEC-Rev-B-1-2

Date:

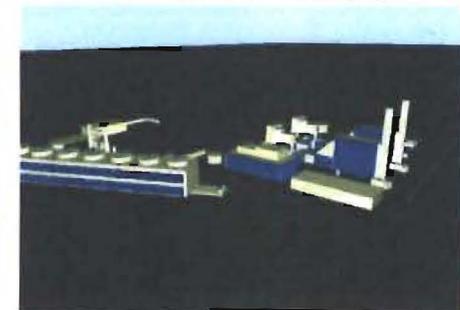
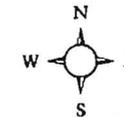
November 14, 2006

Prepared for:

Calpine

Legend:

-  Property Line
-  Access Road Easement



3D View of Model

FIGURE 3.7-1
NOISE CONTOURS
 RCEC AMENDMENT #1
 HAYWARD, CALIFORNIA

SOURCE: Hessler Associates, Inc., 2006

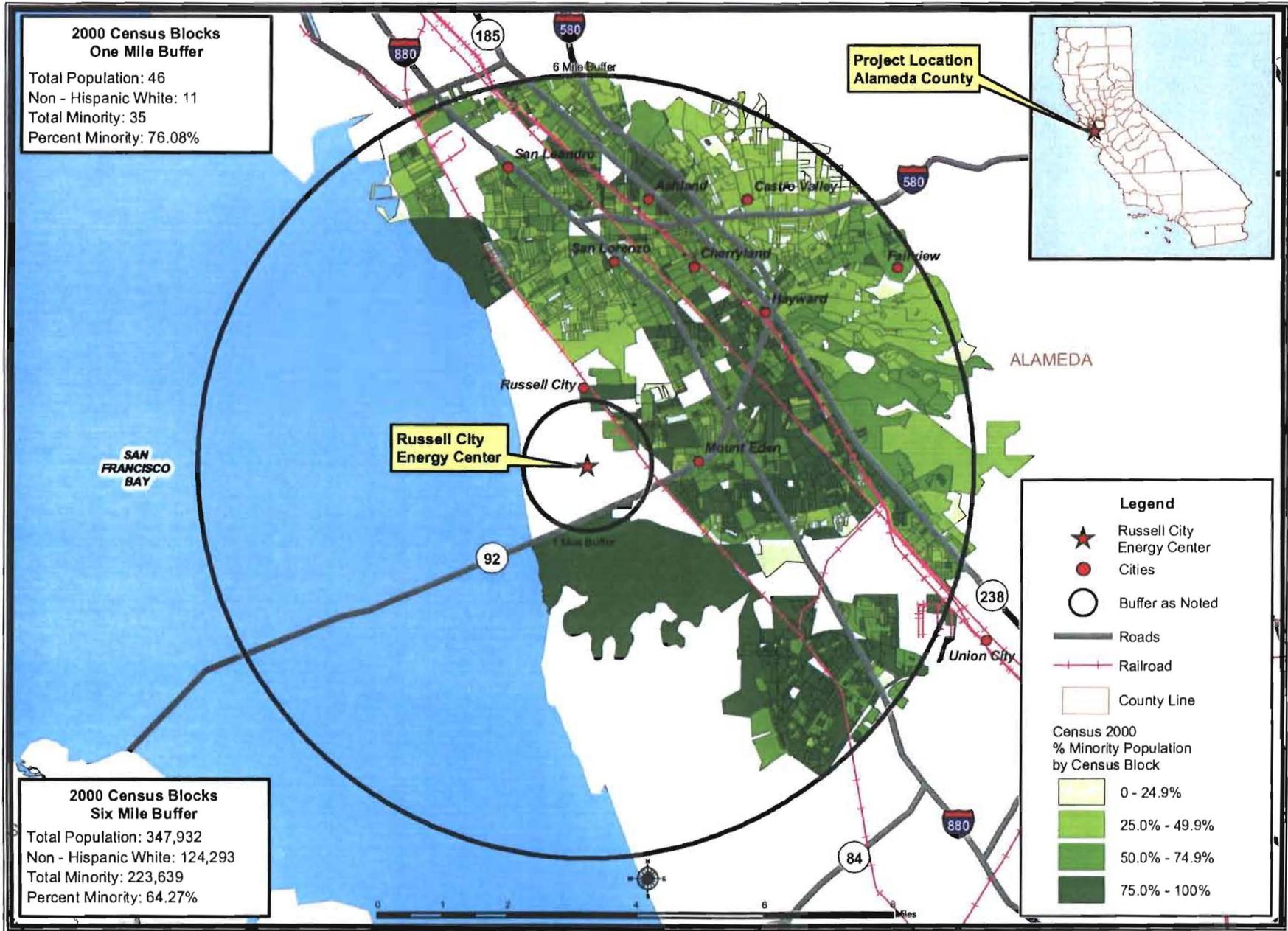
CH2MHILL

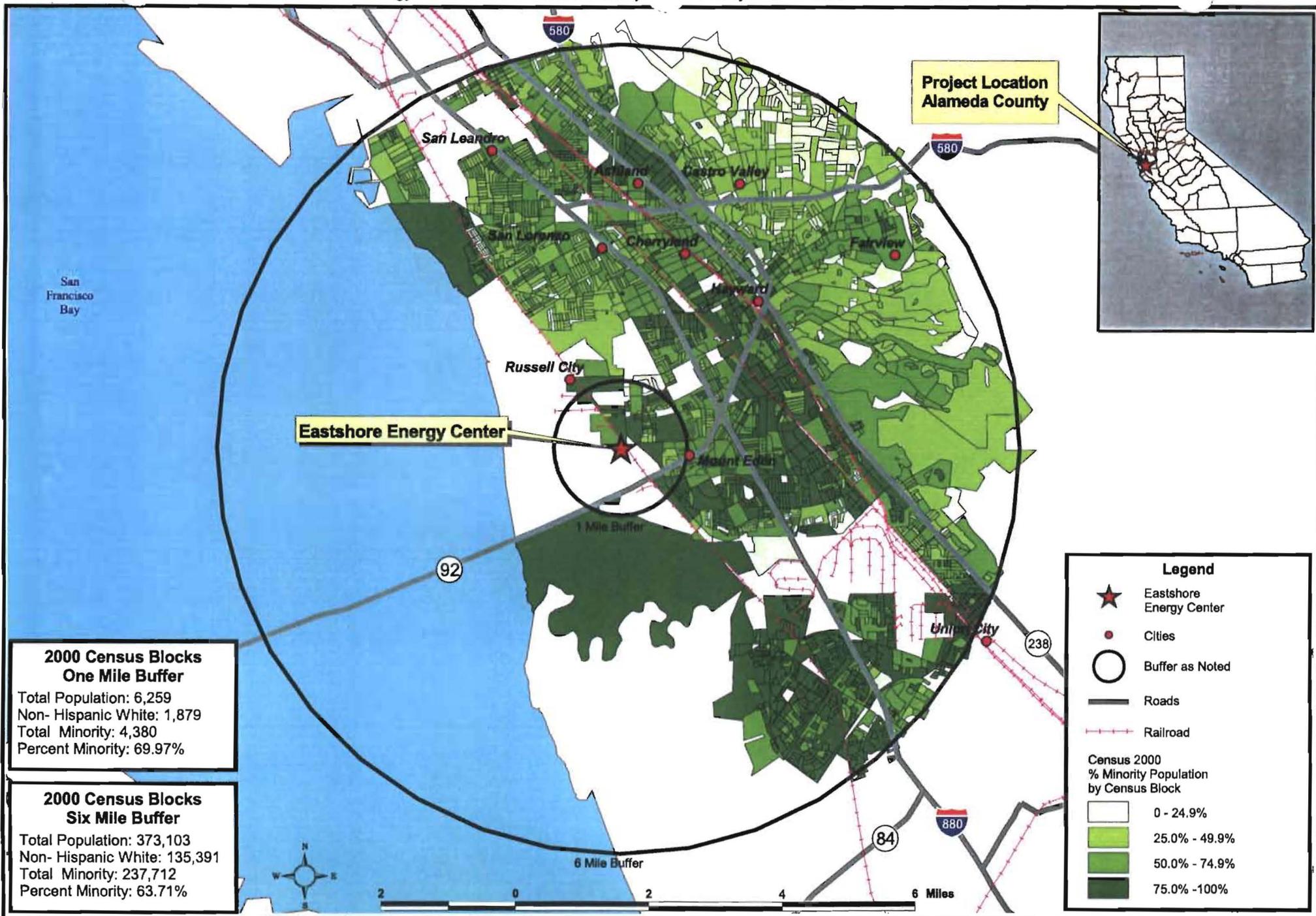
SOCIOECONOMICS - FIGURE 1

Russell City Energy Center Project - Census 2000 Minority Population by Census Block - One and Six Mile Buffer

JANUARY 2007

SOCIOECONOMICS





NOISE AND VIBRATION

Testimony of Steve Baker

SUMMARY OF CONCLUSIONS

The Noise and Vibration findings and conclusions incorporated in the Energy Commission's original decision (Decision) (CEC 2002b) remain valid. The project, as amended, would likely comply with all applicable noise and vibration laws, ordinances, regulations and standards (LORS), and would likely cause no significant adverse noise or vibration impacts. To ensure that such is the case, staff recommends that the conditions of certification embodied in the original Decision be retained, with minor revisions.

INTRODUCTION

This analysis addresses only those aspects of the RCEC that would change as a result of the proposed amendment and that could affect the project's noise and vibration impacts and its compliance with noise and vibration Laws, Ordinances, Regulations and Standards (LORS).

Changes due to the proposed amendment that could affect project noise and vibration include: relocating the project approximately 1,300 feet (1/4 mile) to the northwest of its permitted location; replacing the Advanced Water Treatment plant with a Zero Liquid Discharge facility; deleting the standby generator; installing a new natural gas pipeline in Depot Road; and, constructing a sound wall along the southern edge of the project site (RCEC 2006a). (See original Decision for the project at

.)

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) — COMPLIANCE

Applicable LORS have not changed since the Energy Commission certified the project (CEC 2002b).

SETTING

Two aspects of the proposed amendment could act to change project noise and vibration impacts and compliance with LORS. One is changes to the project equipment list, specifically: the substitution of a Zero Liquid Discharge facility for the Advanced Water Treatment facility; the deletion of the standby generator; the installation of a new natural gas pipeline; and, the construction of a sound wall along the southern edge of the project site. The other is the relocation of the facility 1/4 mile to the northwest, which increases the distance between the facility and nearby sensitive noise receptors. The nearest residential receptor, a residence at 2627 Depot Road, now lies 0.96 miles distant, an increase from its prior distance of 0.82 miles (RCEC 2006a, Table 3.7-1).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

As described in the Decision (CEC 2002b, p. 195), staff examines the proposed project's likely noise and vibration impacts, during project construction and during plant operation, for compliance with applicable LORS, and evaluates these impacts for significance. This same method is employed in analyzing this amendment.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

The project owner explains that relocating the project and the construction parking area will still comply with all applicable noise and vibration LORS, and will cause no new significant impacts (RCEC 2006a, pp. 3-109, 3-110). The new natural gas supply pipeline will be buried in Depot Road. The surroundings of the new site are of the same character as the site certified by the Energy Commission, and likely noise receptors are similar in nature.

Staff agrees with this characterization. Since construction will be governed by the same conditions of certification incorporated in the original Decision, applicable LORS must still be complied with, and no new impacts are likely.

Operation Impacts and Mitigation

The project owner lists changes to the project design that could affect noise emissions (RCEC 2006a, pp. ES-1, 1-1, 2-2, 2-4). These include the substitution of a Zero Liquid Discharge facility for the Advanced Water Treatment facility and the deletion of the standby generator. The City of Hayward has submitted a letter (Hayward 2006) announcing that the project owner has committed to constructing a sound wall along the southern edge of the project site. To ensure that this wall is actually built, staff has proposed a modification to Condition of Certification **NOISE-6** below.

The change in water treatment methods will change the noise generation profile of the power plant. Deletion of the standby generator will decrease periodic noise emissions. The new sound wall will act to reduce noise propagation to the south, toward the Hayward Shoreline Interpretive Center. The project owner has modeled this altered noise regime and compared noise impacts from the amended project to ambient noise levels (RCEC 2006a, Table 3.7-2). This information is presented in **NOISE Table 1**:

NOISE Table 1
Comparison of Ambient Noise and Amended Project Noise Impacts

| Monitoring Location | Average Nighttime L ₉₀ (dBA) | Amended Project Noise (dBA) | Difference (dBA) |
|------------------------------------|---|-----------------------------|------------------|
| Nearest residence – 2627 Depot Rd. | 45.8 | 43 | -2.8 |
| Waterford Apartments | 49.5 | 42 | -7.5 |
| Shoreline Interpretive Center | 51.2 | 45 | -6.2 |
| Cogswell Marsh Bridge | 44.5 | 44 | -0.5 |

Source: RCEC 2006a, Table 3.7-2

In order to evaluate the significance of noise impacts, staff examines the increase in noise levels caused by the project at sensitive receptors. The increases at receptor locations are calculated and displayed in **NOISE Table 2**.

NOISE Table 2
Increase in Noise Levels Caused by Amended Project

| Monitoring Location | Average Nighttime L ₉₀ (dBA) | Amended Project Noise (dBA) | Cumulative Level (dBA) | Increase due to Project (dBA) |
|------------------------------------|---|-----------------------------|------------------------|-------------------------------|
| Northern Project Boundary | N/A | 75* | N/A | — |
| Nearest residence – 2627 Depot Rd. | 45.8 | 43 | 47.8 | +2 |
| Waterford Apartments | 49.5 | 42 | 50.5 | +1 |
| Shoreline Interpretive Center | 51.2 | 45 | 52.2 | +1 |
| Cogswell Marsh Bridge | 44.5 | 44 | 47.5 | +3 |

*RCEC 2006a, Figure 3.7-1

The primary LORS applicable to project operation is the City of Hayward General Plan Noise Element (see above), which limits noise at project boundaries to between 75 dBA and 80 dBA. As seen in **NOISE Table 2** and in the Petition for Amendment (RCEC 2006a, Fig. 3.7-1), project boundary noise levels are not expected to exceed 75 dBA. This constitutes compliance with this LORS.

As explained in the Decision (CEC 2002, p. 197), increases in noise levels of 5 dBA or less, are ordinarily considered insignificant impacts. As shown in **NOISE Table 2** above, predicted increases in noise level due to the project at sensitive receptors range from 1 dBA to 3 dBA. This would constitute an insignificant impact.

The project owner notes (RCEC 2006a, p. 3-113) that Condition of Certification **NOISE-6** required measurement of project noise emissions at the five measurement sites employed in the original Application for Certification. With the relocation of the project, Measurement Site 1 is no longer appropriate. In its place, the project owner requests that this site be changed to a location along the amended project's eastern boundary, the side of the project site that faces the majority of potential noise receptors. Staff

agrees with this change, and proposes this modification in Condition of Certification **NOISE-6** below.

CUMULATIVE IMPACTS AND MITIGATION

Staff knows of no new nearby projects, subsequent to the original Decision, that could combine with the amended project to produce cumulative noise or vibration impacts.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

The only comment received regarding noise is a letter from the City of Hayward (Hayward 2006) that explains how the amended project will comply with all applicable local LORS, and reveals that the project owner has committed to construct a sound wall along the southern edge of the project site. Staff has incorporated this information into the above analysis.

CONCLUSIONS

The Noise and Vibration findings and conclusions incorporated in the original Decision remain valid, with the minor change being that the nearest residential receptors now lie further from the project site (CEC 2002b, p. 203 Finding No. 2). Specifically, the residence at 2627 Depot Road now lies one mile distant. The project, as amended, would likely comply with all applicable noise and vibration LORS, and would likely cause no significant adverse noise or vibration impacts. To ensure that such is the case, staff recommends that the conditions of certification embodied in the original Decision be retained, with minor revisions to Condition of Certification **NOISE-6** as discussed above.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Decision, with the exception that Condition of Certification **NOISE-6** has been modified as a result of the project owner's request, as part of its Petition to Amend submitted to the Energy Commission on November 17, 2006, and as discussed above. Strikeout has been used to indicate deleted language, and underline to indicate new language.

NOISE-1 At least 15 days prior to the start of ground disturbance, the project owner shall notify the City of Hayward, the Hayward Area Recreation District, the East Bay Regional Parks District, and residents within one mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: The project owner shall transmit to the Energy Commission Compliance Project Manager (CPM) in the first Monthly Construction Report following the start of construction, a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner or authorized agent shall:

- Use the Noise Complaint Resolution Form (see Exhibit 1), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
- Attempt to contact the person(s) making the noise complaint within 24 hours;
- Conduct an investigation to determine the source of noise related to the complaint;
- If the noise is project related, take all feasible measures to reduce the noise at its source; and
- Submit a report documenting the complaint and the actions taken. The report shall include a complaint summary, including final results of noise reduction efforts, and, if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the City of Hayward, and with the CPM, documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of ground disturbance, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM the noise control program. The project owner shall make the program available to OSHA upon request.

NOISE-4 The project owner shall employ a low-pressure continuous steam or air blow process. High-pressure steam blows shall be permitted only if the system is equipped with an appropriate silencer that quiets steam blow noise to no greater than 86 dBA, measured at a distance of 50 feet. The project owner

shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM.

Verification: At least 15 days prior to any low-pressure continuous steam or air blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 At least 15 days prior to the first steam or air blow(s), the project owner shall notify the City of Hayward, the Hayward Area Recreation District, the East Bay Regional Parks District, and residents within one mile of the site of the planned activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. The notification shall include a description of the purpose and nature of the steam or air blow(s), the proposed schedule, the expected sound levels, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Within five (5) days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam or air blow activities, including a description of the method(s) of that notification.

NOISE-6 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the project will not cause resultant noise levels to exceed the noise standards of the City of Hayward Municipal Code or Noise Element. Included shall be a sound wall along the southern edge of the project site.

No new pure tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints.

Protocol: Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct short-term survey noise measurements at the eastern boundary of the project site, and at monitoring sites 1, 2, 3, 4, and 5. The short-term noise measurements shall be conducted during both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods. The survey during power plant operation shall also include measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced.

If the results from the survey indicate that the noise level due to the project at monitoring site 2 exceeds 44 dBA L_{eq} , or that the noise standards of the Hayward Noise Element have been exceeded at the eastern boundary of the project site or at monitoring sites 1, 4, or 5, mitigation measures shall be implemented to the project to reduce noise to a level of compliance with these limits.

If the post-construction noise survey indicates that pure tones have been introduced by plant operations, the project owner shall take any necessary corrective actions to eliminate the pure tones.

Verification: Within 30 days after completing the post-construction survey, the project owner shall submit a summary report of the survey to the CPM. Included in the post-construction survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-7 Within 30 days after the facility is in full operation, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

NOISE-8 Heavy equipment operation and noisy construction work shall be restricted to the times of day delineated below:

Monday-Saturday 7:00 a.m. to 7:00 p.m.

Sundays and holidays 10:00 a.m. to 6:00 p.m.

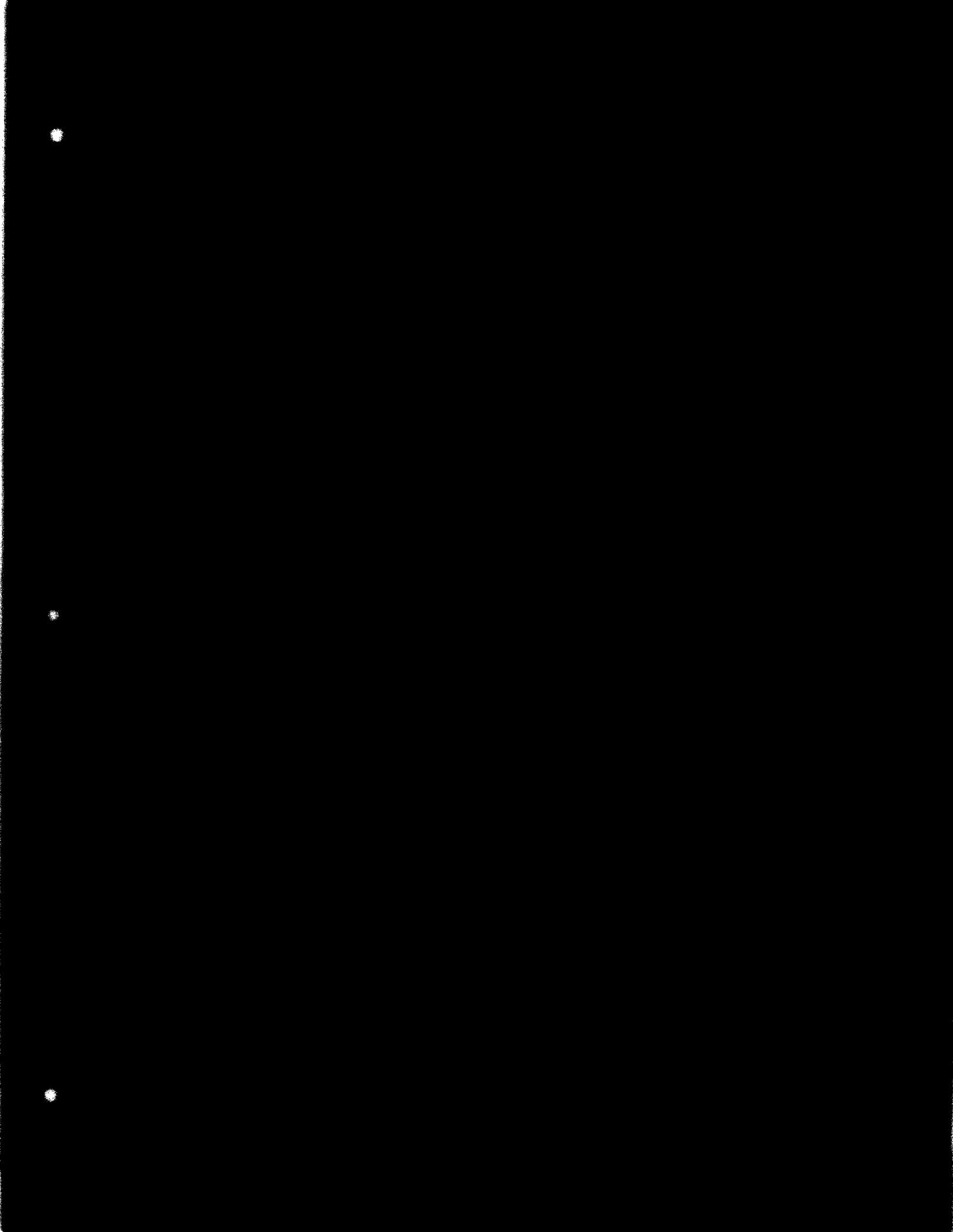
Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

REFERENCES

CEC (California Energy Commission) 2002b — Decision for the Russell City Energy Center AFC, Alameda County, published on September 11, 2002.

Hayward 2006 — City of Hayward letter from Jesús Armas, City Manager, to B. B. Blevins, California Energy Commission, December 5, 2006.

RCEC (Russell City Energy Company, LLC) 2006a — Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.





California Regional Water Quality Control Board

San Francisco Bay Region



Linda S. Adams
Secretary for
Environmental Protection

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
<http://www.waterboards.ca.gov/sanfranciscobay>

Arnold Schwarzenegger
Governor

December 20, 2006
File No. 2198.09 (BKW)

Jeri Zene Scott, Compliance Project Manager
Planning Division
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5515

**Re: Comments on the Request for Agency Participation in the Review of the Russell City Energy Company, LLC, Amendment Petition (01-AFC-7C)
SCH No.: 2005092093**

Dear Ms Scott:

Regional Water Quality Control Board (Water Board) staff have reviewed the Request for Agency Participation in the Review of the Russell City Energy Company, LLC, Amendment Petition (01-AFC-7C). Water Board staff have the following comment on the Amendment Petition.

Comment 1.

Post Construction Stormwater Management.

Neither the original AFC nor the Amended AFC address compliance with the National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharges from new development or significant redevelopment. The documents neglect the requirement to treat stormwater runoff from the developed project, in conformance with the February 2003, Alameda County Clean Water Program, NPDES Municipal Stormwater Permit (Order R2-2003-0021; NPDES Permit No. CAS0029831). Under the NPDES permit, post-construction stormwater best management practices (BMPs) are required to provide treatment that meets the maximum extent practicable (MEP) treatment standard in the Clean Water Act (CWA). To meet the MEP standard, treatment BMPs are to be constructed that incorporate, at a minimum, the following hydraulic sizing design criteria to treat stormwater runoff. As appropriate for each criterion, local rainfall data are to be used or appropriately analyzed for the design of BMPs.

Volume Hydraulic Design Basis: Treatment BMPs whose primary mode of action depends on volume capacity, such as detention/retention units or infiltration structures, shall be designed to treat stormwater runoff equal to:

1. the maximized stormwater quality capture volume for the area, based on historical rainfall records, determined using the formula and volume capture coefficients set forth in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice*

No. 87, (1998), pages 175-178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or

2. the volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology set forth in Appendix D of the *California Stormwater Best Management Practices Handbook*, (1993), using local rainfall data.

Flow Hydraulic Design Basis: Treatment BMPs whose primary mode of action depends on flow capacity, such as swales, sand filters, or wetlands, shall be sized to treat:

1. 10% of the 50-year peak flow rate;
2. or the flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or
3. the flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

Water Board staff strongly encourage the use of landscape-based stormwater treatment measures, such as biofilters and vegetated swales, to manage runoff from project sites. Since landscape-based stormwater treatment measures require that some of the site surface area be set aside for their construction, the proper sizing and placement of these features should be evaluated early in the design process to facilitate incorporation of the features into the site landscaping. Water Board staff discourage the use of inlet filter devices for stormwater management. Filtration systems require a maintenance program that is adequate to maintain the functional integrity of the systems and to ensure that improperly maintained filtration devices do not themselves become sources of stormwater contaminants or fail to function. Water Board staff have observed problems with the use of inlet filter inserts, since these devices require high levels of maintenance and are easily clogged by leaves or other commonly occurring debris, rendering them ineffective. Research conducted by the California Department of Transportation has demonstrated that inlet filters can be clogged by a single storm event. The study found that these devices required maintenance before and after storm events as small as 0.1 inch of rain.¹ In addition, trash, debris, and sediment in the catchment had a significant impact on the frequency of maintenance. Therefore, adequate maintenance of inlet filters to provide MEP water quality treatment would be prohibitively expensive and impractically time consuming.

Water Board staff recommend that the project proponents refer to *Start at the Source*, a design guidance manual for storm water quality protection, for a fuller discussion of the selection of stormwater management practices. This manual provides innovative procedures for designing

¹ Othmer, Friedman, Borroum and Currier, November 2001, *Performance Evaluation of Structural BMPs: Drain Inlet Inserts (Fossil Filter™ and StreamGuard™) and Oil/Water Separator*, Sacramento, Caltrans.



structures, parking lots, drainage systems, and landscaping to mitigate the impacts of stormwater runoff on receiving waters. This manual may be obtained from the Santa Clara Valley Urban Runoff Pollution Prevention Program's website (www.scvurppp.org) or by e-mailing a request to the e-mail address in the last paragraph of this letter. Additional innovative techniques for incorporating structural stormwater best management practices (BMPs) into urban design, such as infiltration planter boxes, can be found in Portland, Oregon's *2002 Stormwater Management Manual*, which can be obtained at www.cleanrivers-pdx.org/tech_resources/2002_swmm.htm.

If you have questions, please contact me at (510) 622- 5680 or by email at bwines@waterboards.ca.gov.

Sincerely,
[Original Signed by Brian Wines 12/20/2006]

Brian Wines
Water Resources Control Engineer
South/East Bay Section

cc: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044



From: "Richard Latteri" <Rlatteri@energy.state.ca.us>
To: <BWines@waterboards.ca.gov>
Date: Fri, Dec 29, 2006 1:02 PM
Subject: Re: Fwd: Russel City Energy LLC (01-AFC-7C)

Brian,

I'm the person assessing the water and soil impacts of the Russell City Energy, LLC, Amendment Petition. Thank you for your comments; Ms. Jeri Scott, the RCEC Compliance Project Manager, forwarded your comment letter to me.

During my review of the amendment, I too noticed that there was no reference to the City of Hayward's MS4 permit (Order No. R2-2003-0021). I have requested additional information from Russell City Energy, LLC, on their plans to comply with City's municipal permit as this will be a requirement, along with their Construction/Industrial SWPPPs, in their amended license from the CEC.

I have suggested to Ms. Scott that an inter-agency meeting with Russell City Energy, LLC, be held in the City of Hayward to address all regional board and DHS requirements for the new plant. To this end, can you please provide me with the names and e-mail addresses of those individuals within the SFBRWQCB responsible for:

Reclamation requirements pursuant to SWC Section 13524 * Russell City Energy, LLC, proposes to use up to 3,600 AFY of tertiary treated recycled water for evaporative cooling. Cleanup and redevelopment of brownfield sites * Russell City Energy, LLC, proposes to construct the RCEC on a new site which is and has been used for commercial and industrial purposes. The board's policy and enforcement of SWC Section 100 for the reasonable use of high quality surface waters for power plant cooling * Russell City Energy, LLC, proposes to use potable water as the plant's backup cooling source. I would like to contact those individuals regarding the boards requirements and/or jurisdiction for the above mentioned policies, and their availability to meet with the City of Hayward, Russell City Energy, LLC, DHS, and the CEC so that all state and local environmental requirements can be identified and addressed.

Please provide me the name and e-mail addresses at your earliest convenience. Thanks again for your comments; I look forward to your response.

Richard Latteri
Water & Soil Resources Unit
California Energy Commission
916.651.8859
rlatteri@energy.state.ca.us

>>> Jeri Scott 9:42:12 AM 12/21/06 >>>

Richard,

I thought you may like to review these comments now so I am forwarding this e-mail to you. When I receive the signed document I will make sure you get a docketed copy of it for your file.

Jeri

>>> "Brian Wines" <BWines@waterboards.ca.gov> 12/20/06 5:36 PM >>>

Hi Jeri

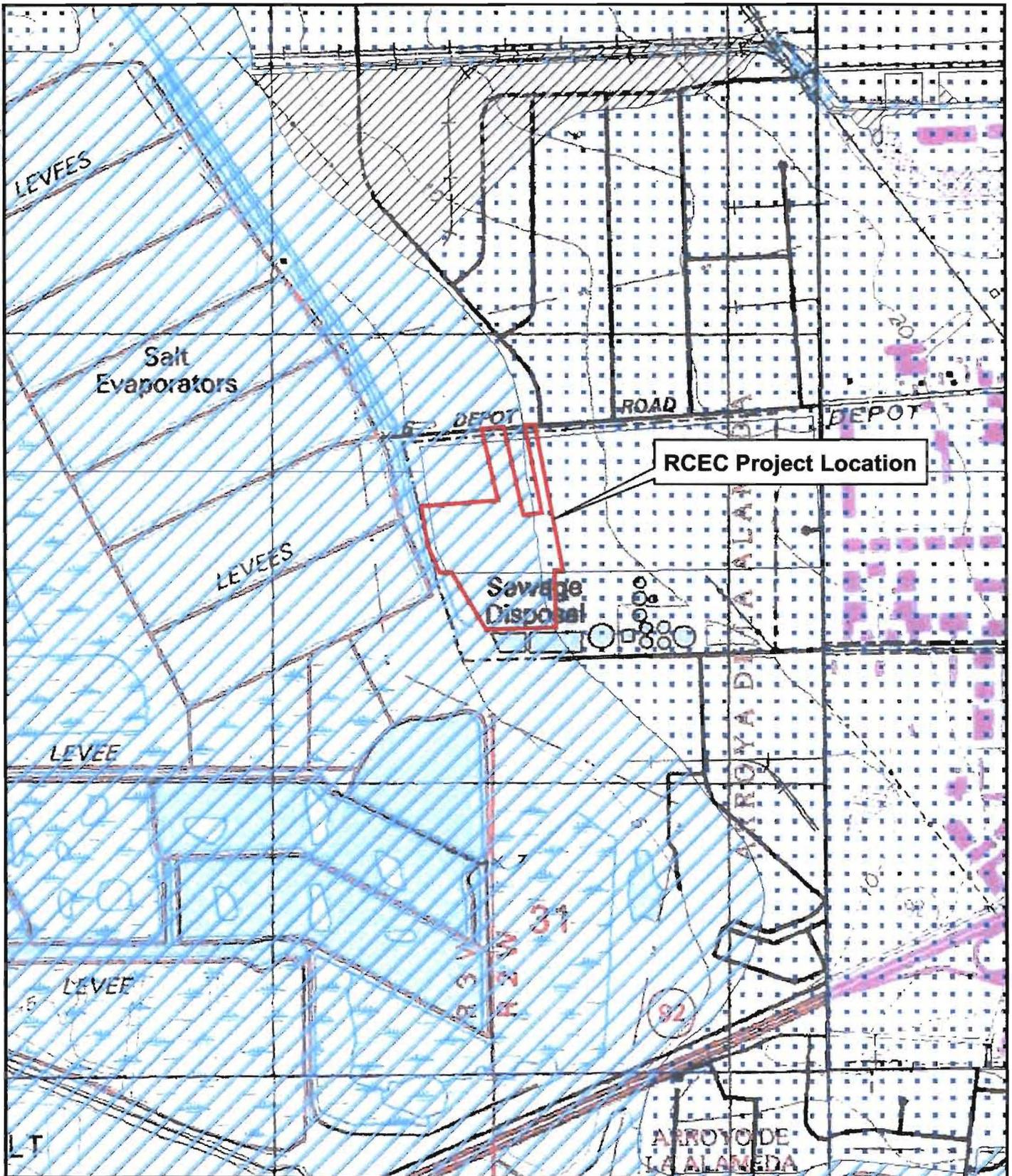
I've attached an efile of my comment letter. Could you send me your fax number so I can fax the signed version over?



Thanks
Brian Wines
Water Resources Control Engineer
San Francisco Bay Regional Water Quality Control Board

CC: "Jeri Scott" <Jscott@energy.state.ca.us>, "Paul Richins"
<Prichins@energy.state.ca.us>, "Roger Johnson" <Rjohnson@energy.state.ca.us>





LEGEND

 RCEC LOCATION

FEMA Zones

 Zone A - Subject to 100-year flood

 Zone X - Areas outside the 500-year flood plain

 Zone X500 - Areas between the limits of the 100-year and 500-year flood plain

0 250 500 1,000

Feet

SCALE IS APPROXIMATE

**FIGURE 3.10-1
FEMA FLOOD ZONES**

RCEC AMENDMENT #1
HAYWARD, CALIFORNIA

SUMMARY OF AIR QUALITY IMPACT ANALYSIS FOR THE RUSSELL CITY ENERGY CENTER

September 24, 2001

BACKGROUND

Calpine Corporation and Bechtel Enterprises Holdings, Inc. has submitted a permit application (# 2896) 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 10-cell cooling tower, a natural gas fueled emergency generator and a diesel fire pump engine. The proposed project will result in an increase in air pollutant emissions of NO₂, CO, PM₁₀ and SO₂ triggering regulatory requirements for an air quality impact analysis.

AIR QUALITY IMPACT ANALYSIS REQUIREMENTS

Requirements for air quality impact analysis are given in the District's New Source Review (NSR) Rule: Regulation 2, Rule 2.

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 E-1
Comparison of proposed project's annual worst case emissions
to significant emission rates for air quality impact analysis

| Pollutant | Proposed Project's Emissions (tons/year) | Significant Emission Rate (tons/year) (Reg-2-2-304 to 2-2-306) | EPA PSD Significant Emission Rates for major stationary sources (tons/year) |
|------------------|--|---|---|
| NO ₂ | 134.6 | 100 | 40 |
| CO | 610.2 | 100 | 100 |
| PM ₁₀ | 86.3 | 100 | 15 |
| SO ₂ | 12.4 | 100 | 40 |

Table I indicates that the proposed project emissions exceed District significant emission levels for nitrogen oxides (NO_x), carbon monoxide (CO), and respirable particulate matter (PM₁₀). 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 EPA PSD significant emission rates (shown in the last column in Table I). Table I shows that the NO₂, CO and PM₁₀ ambient impacts from the project must be modeled. The detailed requirements for an air quality

impact analysis for these pollutants are given in Sections 304, 305 and 306 of the District's NSR Rule and 40 CFR 51.166 of the Code of Federal Regulations.

The District's NSR Rule also contains 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 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 Section 414 of Regulation 2 Rule 2. According to subsection 414.1, 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, no further analysis is required. (Consistent with EPA 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. EPA also requires a Class I increment analysis of any PSD source which increases NO₂ or PM₁₀ concentrations by 1 µg/m³ or more (24-hour average) in a Class I area.

Air Quality Modeling Methodology

Maximum ambient concentrations of NO₂, CO and PM₁₀ 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, the emergency generator will be exhausted from a 10 foot stack, and the fire pump will be exhausted from a 30 foot exhaust stack. Emissions from a 10-cell cooling tower will be released at a height of 64 feet. Table II contains the emission rates used in each of the modeling scenarios: turbine commissioning, turbine startup, maximum 1-hour, maximum 8-hour, maximum 24-hour, and maximum annual average. Commissioning is the original startup of the turbines and only occurs during the initial operation of the equipment after installation. Startup conditions were modeled with one turbine in startup mode, while the other turbine was in normal operation.

The EPA models SCREEN3 and ISCST3 were used in the air quality impacts analysis. A land use analysis showed that the rural dispersion coefficients were required for the analysis. The models were run using five years of meteorological data (1990 through 1994) collected approximately 6.6 km southeast of the project at the BAAQMD's Union City meteorological monitoring station. Because the exhaust stacks are less than Good Engineering Practice (GEP) stack height, ambient impacts due to building downwash were evaluated. Using 1990-1994 San Leandro ozone monitoring data, the Ozone

Appendix E

Limiting Method was employed to convert one-hour NO_x impacts into one-hour NO₂ impacts. (The San Leandro monitoring station is located 8.8 km north of the project) The Ambient Ratio Methodology (with a default NO₂/NO_x ratio of 0.75) was used for determining the annual-averaged NO₂ concentrations. Because complex terrain was located nearby, complex terrain impacts were considered. Inversion breakup fumigation and shoreline fumigation were evaluated using the SCREEN3 model.

TABLE E-2
Averaging period emission rates used in modeling analysis (g/s)

| Pollutant Source | Max. (1-hour) | Commissioning ¹ (1-hour) | Start-up ² (1-hour) | Max. (8-hour) | Max. (24-hour) | Max. Annual Average |
|------------------|------------------------------------|-------------------------------------|--------------------------------|---------------|--------------------|---------------------|
| NO ₂ | Turbine/Duct Burner 1 | 1.591 | 48.132 | 1.591 | — | 1.927 |
| | Turbine/Duct Burner 2 | 1.591 | — | 10.08 | — | 1.927 |
| | Emergency Generator | — | — | — | — | 0.0051 |
| | Fire Pump | 0.491 | — | — | — | 0.00168 |
| | Each Cooling Tower Cell (10 total) | — | — | — | — | — |
| CO | Turbine/Duct Burner 1 | 2.356 | 11.9 | 2.356 | 41.07 ³ | — |
| | Turbine/Duct Burner 2 | 2.356 | — | 113.65 | 41.07 ³ | — |
| | Emergency Generator | 0.380 | — | — | 0.0370 | — |
| | Fire Pump | — | — | — | — | — |
| | Each Cooling Tower Cell (10 total) | — | — | — | — | — |
| PM ₁₀ | Turbine/Duct Burner 1 | — | — | — | 1.134 | 1.20 |
| | Turbine/Duct Burner 2 | — | — | — | 1.134 | 1.20 |
| | Emergency Generator | — | — | — | — | 0.000018 |
| | Fire Pump | — | — | — | 0.000669 | 0.000055 |
| | Each Cooling Tower Cell (10 total) | — | — | — | 0.00863 | 0.00863 |

¹Commissioning is the original startup of a turbine and only occurs during the initial operation of the equipment after installation. Both turbines will not be commissioned at the same time. ²Start-up is the beginning of any of the subsequent duty cycles to bring one turbine from idle status up to power production. ³Maximum 8 hour CO emissions include start-up period emissions.

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.

Also shown in Table III are the corresponding significant ambient impact levels listed in Section 233 of the District's NSR Rule. In accordance with Regulation 2-2-414 further analysis is required only for the

Appendix E

those pollutants for which the modeled impact is above the significant air quality impact level. Table III shows that the only impact requiring further analysis is the 1-hour NO₂ modeled impact.

TABLE E-3

Maximum predicted ambient impacts of proposed project (µg/m³)
[maximums are in bold type]

| Pollutant | Averaging Time | Commissioning Maximum Impact | Start-up (one hour) | Inversion Break-up Furnigation Impact | Shoreline Furnigation Impact | ISCST3 Modeled Impact | Significant Air Quality Impact Level |
|------------------|----------------|------------------------------|---------------------|---------------------------------------|------------------------------|-----------------------|--------------------------------------|
| NO ₂ | 1-hour | 120.7 | 75.0 | 13.2 | 34.6 | 216 | 19 |
| | annual | — | — | — | — | 0.36 | 1.0 |
| CO | 1-hour | 69.8 | 890 | 15.3 | 39.9 | 1231 | 2000 |
| | 8-hour | — | — | 7.8 | 20.1 | 254 | 500 |
| PM ₁₀ | 24-hour | — | — | 1.6 | 4.1 | 4.1 | 5 |
| | annual | — | — | — | — | 0.22 | 1 |

Background Air Quality Levels

Regulation 2-2-111 entitled “Exemption, PSD Monitoring,” exempts an applicant from the requirement of monitoring background concentrations in the impact area (section 414.3) provided the impacts from the proposed project are less than specified levels. Table IV lists the applicable exemption standard and the maximum impact from the proposed facility. As shown, the modeled NO₂ impact is well below the preconstruction monitoring threshold.

TABLE E-4
PSD monitoring exemption level and maximum impact from the proposed project for NO₂ (µg/m³)

| Pollutant | Averaging Time | Exemption Level | Maximum Impact from Proposed Project |
|-----------------|----------------|-----------------|--------------------------------------|
| NO ₂ | annual | 14 | 0.36 |

The District-operated Fremont-Chapel Way Monitoring Station, located 18.3 km southeast of the project, was chosen as representative of background NO₂ concentrations. Table V contains the concentrations measured at the site for the past 5 years (1996 through 2000).

Appendix E

TABLE E-5
Background NO₂ (µg/m³) at Fremont-Chapel Way Monitoring
Station for the past five years (maximum is in bold type)

| | NO ₂ |
|------|------------------------|
| Year | Highest 1-hour average |
| 1996 | 165 |
| 1997 | 162 |
| 1998 | 184 |
| 1999 | 211 |
| 2000 | 152 |

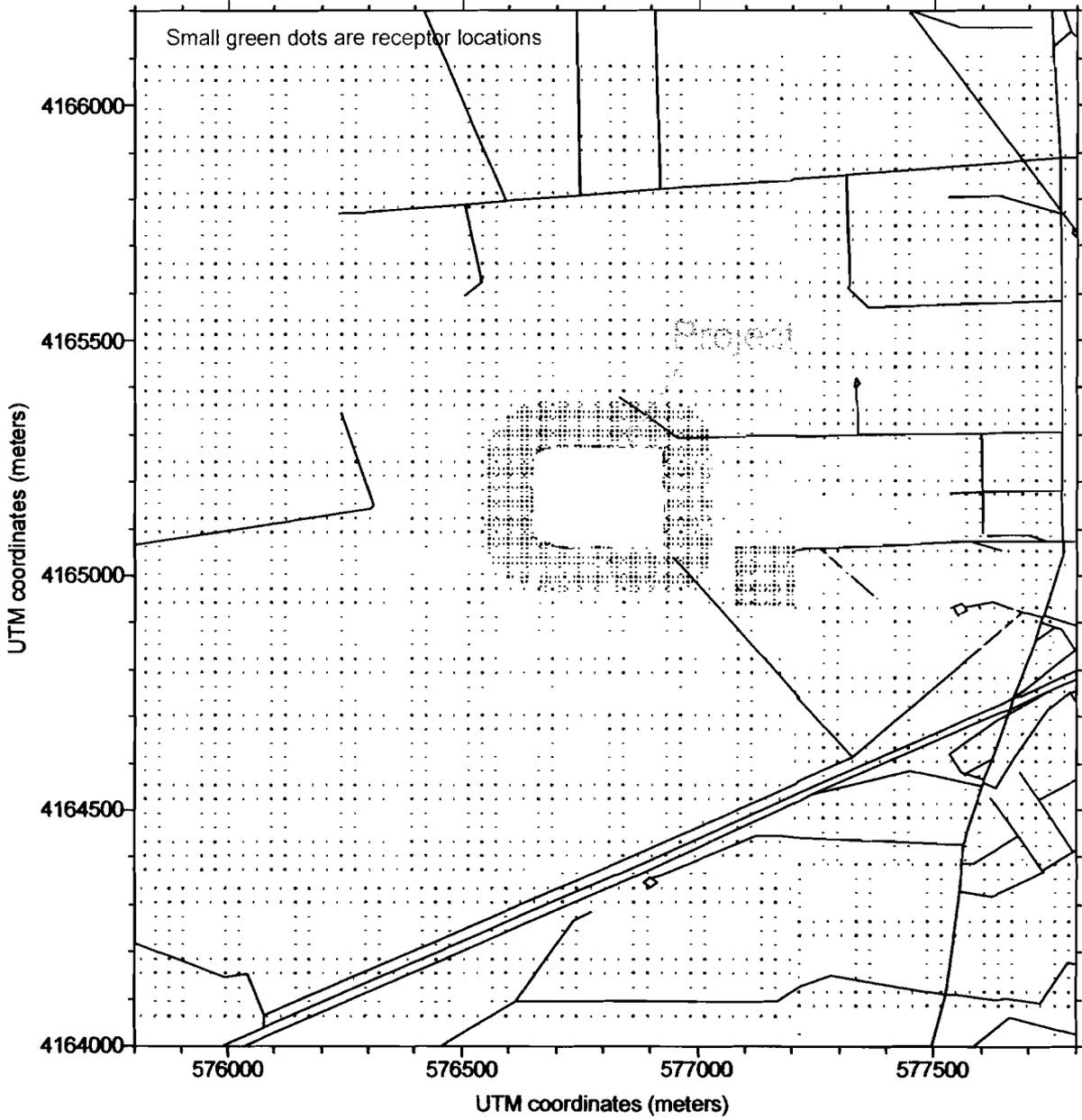


FIGURE 1. Location of project maximum impacts.

Table VI below contains the comparison of the ambient standards with the proposed project impacts added to the maximum background concentrations. The California ambient NO₂ standard is not exceeded from the proposed project.

TABLE E-6
California and national ambient air quality standard and ambient air quality level from the proposed project (µg/m³)

| Pollutant | Averaging Time | Maximum Background | Maximum combined project and existing facility impact | Maximum combined impact plus maximum background | California Standard | National Standard |
|-----------------|----------------|--------------------|---|---|---------------------|-------------------|
| NO ₂ | 1-hour | 211 | 216 | 427 | 470 | --- |

CLASS I PSD INCREMENT ANALYSIS

EPA requires an increment analysis of any PSD source within 100 km of a Class I area which increases NO₂ or PM₁₀ concentrations by 1 µg/m³ 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 VII are the results from an impact analysis using both Calpuff and ISCST3. The table shows that the maximum 24-hour NO₂ and PM₁₀ impacts within the Point Reyes National Seashore are well below the 1 µg/m³ significance level (see Table VII)

TABLE E-7
Class I 24-hour air quality impacts analysis for the Point Reyes National Seashore (µg/m³)

| Pollutant | Calpuff | ISCST3 | Significance level | Significant |
|------------------|---------|--------|--------------------|-------------|
| NO ₂ | 0.30 | 0.28 | 1.0 | no |
| PM ₁₀ | 0.12 | 0.16 | 1.0 | no |

VISIBILITY, SOILS AND VEGETATION IMPACT ANALYSIS

Visibility impacts were assessed using both EPA'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.

The project maximum one-hour average NO₂, including background, is 427 µg/m³. This concentration is below the California one-hour average NO₂ standard of 470 µg/m³. Crop damage from NO₂ requires exposure to concentrations higher than 470 µg/m³ for periods longer than one hour.

Maximum project NO₂, CO, SO₂ and PM₁₀ concentrations would be less than all of the applicable national primary and secondary ambient air quality standards, which are designed to protect the public

Appendix E

welfare from any known or anticipated effects, including plant damage. Therefore, the facility's impact on soils and vegetation would be insignificant.

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 NO₂, CO and PM₁₀. The analysis was based on EPA approved models and calculation procedures and was performed in accordance with Section 414 of the District's NSR Rule.

SUMMARY OF AIR QUALITY IMPACT ANALYSIS FOR THE RUSSELL CITY ENERGY CENTER

February 7, 2007

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 an increase in air pollutant emissions of NO₂, CO, PM₁₀ and SO₂ triggering regulatory requirements for an air quality impact analysis.

AIR QUALITY IMPACT ANALYSIS REQUIREMENTS

Requirements for air quality impact analysis are given in the District's New Source Review (NSR) Rule: Regulation 2, Rule 2.

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 1 | | | |
|---|--|---|---|
| Comparison of proposed project's annual worst case emissions to significant emission rates for air quality impact analysis | | | |
| Pollutant | Proposed Project's Emissions (tons/year) | Significant Emission Rate (tons/year) (Reg-2-2-304 to 2-2-306) | EPA PSD Significant Emission Rates for major stationary sources (tons/year) |
| NO _x | 134.6 | 100 | 40 |
| CO | 584.2 | 100 | 100 |
| PM ₁₀ | 86.8 | 100 | 15 |
| SO ₂ | 12.2 | 100 | 40 |

Table I indicates that the proposed project emissions exceed District significant emission levels for nitrogen oxides (NO_x), carbon monoxide (CO), and respirable particulate matter (PM₁₀). 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 EPA PSD significant emission rates (shown in the last column in Table I). Table I shows that the NO₂, CO and PM₁₀ ambient impacts from the project must be modeled. The detailed requirements for an air quality impact analysis for these pollutants are given in Sections

304, 305 and 306 of the District's NSR Rule and 40 CFR 51.166 of the Code of Federal Regulations.

The District's NSR Rule also contains 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 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 Section 414 of Regulation 2 Rule 2. According to subsection 414.1, 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, no further analysis is required. (Consistent with EPA 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. EPA also requires a Class I increment analysis of any PSD source which increases NO₂ or PM₁₀ concentrations by 1 $\mu\text{g}/\text{m}^3$ or more (24-hour average) in a Class I area.

Air Quality Modeling Methodology

Maximum ambient concentrations of NO₂, CO and PM₁₀ 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: turbine commissioning, turbine startup, maximum 1-hour, maximum 8-hour, maximum 24-hour, and maximum annual average. Commissioning is the original startup of the turbines and only occurs during the initial operation of the equipment after installation. Startup conditions were modeled with one turbine in startup mode, while the other turbine was in normal operation.

The EPA models SCREEN3 and ISCST3 were used in the air quality impacts analysis. A land use analysis showed that the rural dispersion coefficients were required for the analysis. The models were run using five years of meteorological data (1990 through 1994) collected approximately 6.6 km southeast of the project at the BAAQMD's Union City meteorological monitoring station. Because the exhaust stacks are less than Good Engineering Practice (GEP) stack height, ambient impacts due to building downwash were evaluated. Using 1990-1994 San Leandro ozone monitoring data, the Ozone Limiting Method was employed to convert one-hour

NO_x impacts into one-hour NO₂ impacts. (The San Leandro monitoring station is located 8.8 km north of the project) The Ambient Ratio Methodology (with a default NO₂/NO_x ratio of 0.75) was used for determining the annual-averaged NO₂ concentrations. Because complex terrain was located nearby, complex terrain impacts were considered. Inversion breakup fumigation and shoreline fumigation were evaluated using the SCREEN3 model.

TABLE 2
Averaging period emission rates used in modeling analysis (g/s)

| Pollutant Source | Max. (1-hour) | Commissioning ¹ (1-hour) | Start-up ² (1-hour) | Start-up ² (8-hour) | Max. (8-hour) | Max. (24-hour) | Max. Annual Average |
|------------------------------------|---------------|-------------------------------------|--------------------------------|--------------------------------|---------------|----------------|---------------------|
| NO_x | | | | | | | |
| Turbine/Duct Burner 1 | 2.04 | 48.36 | 12.25 | — | — | — | 1.94 |
| Turbine/Duct Burner 2 | 2.04 | 2.04 | 12.25 | — | — | — | 1.94 |
| Fire Pump | 0.36 | — | — | — | — | — | 0.00211 |
| Each Cooling Tower Cell (9 total) | — | — | — | — | — | — | — |
| CO | | | | | | | |
| Turbine/Duct Burner 1 | 2.48 | 627.47 | 169.95 | 80.24 | 1.34 | — | — |
| Turbine/Duct Burner 2 | 2.48 | 2.48 | 169.95 | 80.24 | 1.34 | — | — |
| Fire Pump | 0.0275 | — | — | — | 0.0034 | — | — |
| Each Cooling Tower Cell (9 total) | — | — | — | — | — | — | — |
| PM₁₀ | | | | | | | |
| Turbine/Duct Burner 1 | — | — | — | — | — | 1.134 | 1.07 |
| Turbine/Duct Burner 2 | — | — | — | — | — | 1.134 | 1.07 |
| Fire Pump | — | — | — | — | — | 0.000417 | 0.0000594 |
| Each Cooling Tower Cell (9 total)) | — | — | — | — | — | 0.0396 | 0.0387 |

¹Commissioning is the original startup of a turbine and only occurs during the initial operation of the equipment after installation. Both turbines will not be commissioned at the same time. ²Start-up is the beginning of any of the subsequent duty cycles to bring one turbine from idle status up to power production.

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.

Also shown in Table III are the corresponding significant ambient impact levels listed in Section 233 of the District's NSR Rule. In accordance with 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. Table III shows that the only impact requiring further analysis is the 1-hour NO₂ modeled impact.

| TABLE 3 Maximum predicted ambient impacts of proposed project (µg/m³) [maximums are in bold type] | | | | | | | |
|---|----------------|------------------------------|----------|--------------------------------------|-----------------------------|-----------------------|--------------------------------------|
| Pollutant | Averaging Time | Commissioning Maximum Impact | Start-up | Inversion Break-up Fumigation Impact | Shoreline Fumigation Impact | ISCST3 Modeled Impact | Significant Air Quality Impact Level |
| NO ₂ | 1-hour | 119.2 | 77 | 9.5 | 62.4 | 226.8 | 19 |
| | annual | — | — | — | — | 0.14 | 1.0 |
| CO | 1-hour | 1977 | 1069 | 6.5 | 36.5 | 134.7 | 2000 |
| | 8-hour | 348 | 178 | — | — | 5.7 | 500 |
| PM ₁₀ | 24-hour | — | — | 2.9 | 3.2 | 2.94 | 5 |
| | annual | — | — | — | — | 0.15 | 1 |

Background Air Quality Levels

Regulation 2-2-111 entitled “Exemption, PSD Monitoring,” exempts an applicant from the requirement of monitoring background concentrations in the impact area (section 414.3) provided the impacts from the proposed project are less than specified levels. Table IV lists the applicable exemption standard and the maximum impact from the proposed facility. As shown, the modeled NO₂ impact is well below the preconstruction monitoring threshold.

| TABLE 4 PSD monitoring exemption level and maximum impact from the proposed project for NO₂ (µg/m³) | | | |
|--|----------------|-----------------|--------------------------------------|
| Pollutant | Averaging Time | Exemption Level | Maximum Impact from Proposed Project |
| NO ₂ | annual | 14 | 0.14 |

The District-operated Fremont-Chapel Way Monitoring Station, located 18.3 km southeast of the project, was chosen as representative of background NO₂ concentrations. Table V contains the concentrations measured at the site for the past 5 years (1996 through 2000).

Table VI below contains the comparison of the ambient standards with the proposed project impacts added to the maximum background concentrations. The California ambient NO₂ standard is not exceeded from the proposed project.

| TABLE 6 California and national ambient air quality standard and ambient air quality level from the proposed project (µg/m ³) | | | | | | |
|--|----------------|--------------------|--------------------------------------|---|---------------------|-------------------|
| Pollutant | Averaging Time | Maximum Background | Maximum Impact from Proposed Project | Maximum combined impact plus maximum background | California Standard | National Standard |
| NO ₂ | 1-hour | 143 | 227 | 370 | 470 | --- |

CLASS I PSD INCREMENT ANALYSIS

EPA requires an increment analysis of any PSD source within 100 km of a Class I area which increases NO₂ or PM₁₀ concentrations by 1 µg/m³ 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 VII are the results from an impact analysis using ISCST3. The table shows that the maximum 24-hour NO₂ and PM₁₀ impacts within the Point Reyes National Seashore are well below the 1 µg/m³ significance level (see Table VII)

| TABLE 7 Class I 24-hour air quality impacts analysis for the Point Reyes National Seashore (µg/m ³) | | | |
|--|--------|--------------------|-------------|
| Pollutant | ISCST3 | Significance level | Significant |
| NO ₂ | 0.26 | 1.0 | no |
| PM ₁₀ | 0.21 | 1.0 | no |

VISIBILITY, SOILS AND VEGETATION IMPACT ANALYSIS

Visibility impacts were assessed using both EPA'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.

The project maximum one-hour average NO₂, including background, is 370 µg/m³. This concentration is below the California one-hour average NO₂ standard of 470 µg/m³. Crop

damage from NO₂ requires exposure to concentrations higher than 470 µg/m³ for periods longer than one hour.

Maximum project NO₂, CO, SO₂ and PM₁₀ concentrations would be less than all of the applicable national primary and secondary ambient air quality standards, which are designed to protect the public welfare from any known or anticipated effects, including plant damage. Therefore, the facility's impact on soils and vegetation would be insignificant.

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 NO₂, CO and PM₁₀. The analysis was based on EPA approved models and calculation procedures and was performed in accordance with Section 414 of the District's NSR Rule.

Appendix F

BACT Cost-Effectiveness Data



**Cost Analysis of NO_x Control Alternatives for
Stationary Gas Turbines**

Contract No. DE-FC02-97CHIO877

Prepared for:

**U.S. Department of Energy
Environmental Programs
Chicago Operations Office
9800 South Cass Avenue
Chicago, IL 60439**

Prepared by:

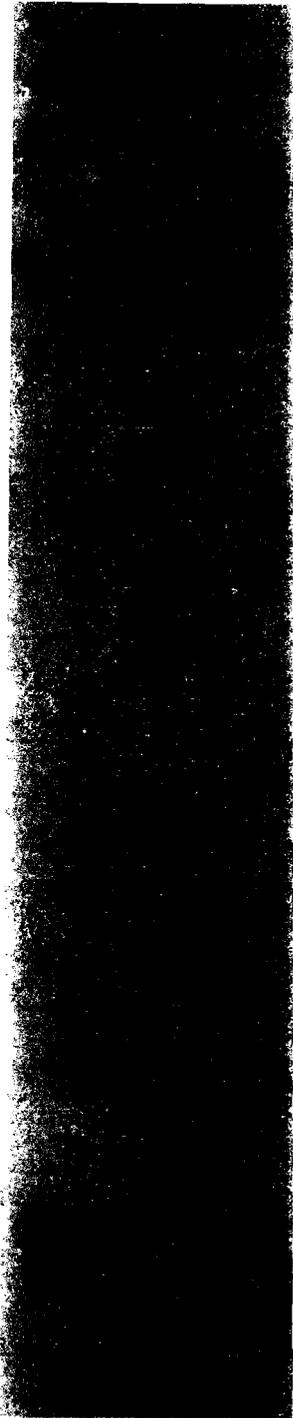
**ONSITE SYCOM Energy
Corporation
701 Palomar Airport Road,
Suite 200
Carlsbad, California 92009**

October 15, 1999

**TABLE A-5
1999 CONVENTIONAL SCR COST COMPARISON**

| | | 5 MW Class | 25 MW Class | 150 MW Class |
|--|---|---|--------------------|------------------------|
| | | Solar Centaur 50 4.2 MW | GE LM2500 23 MW | GE Frame 7FA 161 MW |
| Turbine Model | | | | |
| Turbine Output | | | | |
| Direct Capital Costs (DC): | | | | |
| Purchased Equip. Cost (PE): | Source | | | |
| Basic Equipment (A): | MHIA | | | |
| Ammonia injection skid and storage | 0.00 x A | \$240,000 | \$860,000 | \$2,100,000 |
| Instrumentation | 0.00 x A | included | included | included |
| Taxes and freight | 0.08 A x B | \$19,015 | \$52,748 | \$169,530 |
| PE Total: | | \$256,704 | \$712,066 | \$2,288,649 |
| Direct Installation Costs (DI)* | | | | |
| Foundation & supports: | 0.08 x PE | \$20,538 | \$56,865 | \$183,092 |
| Handling and erection: | 0.14 x PE | \$35,939 | \$99,689 | \$320,411 |
| Electrical: | 0.04 x PE | \$10,268 | \$28,483 | \$91,548 |
| Piping: | 0.02 x PE | \$5,134 | \$14,241 | \$45,773 |
| Insulation: | 0.01 x PE | \$2,567 | \$7,121 | \$22,886 |
| Painting: | 0.01 x PE | \$2,567 | \$7,121 | \$22,886 |
| DI Total: | | \$77,011 | \$213,820 | \$686,595 |
| DC Total: | | \$333,716 | \$925,886 | \$2,975,244 |
| Indirect Costs (IC): | | | | |
| Engineering: | 0.10 x PE | \$25,670 | \$71,207 | \$100,000 |
| Construction and field expenses: | 0.05 x PE | \$12,835 | \$35,603 | \$114,432 |
| Contractor fees: | 0.10 x PE | \$25,670 | \$71,207 | \$228,865 |
| Start-up: | 0.02 x PE | \$5,134 | \$14,241 | \$45,773 |
| Performance testing: | 0.01 x PE | \$2,567 | \$7,121 | \$22,886 |
| Contingencies: | 0.03 x PE | \$7,701 | \$21,362 | \$68,659 |
| IC Total: | | \$79,578 | \$220,741 | \$580,616 |
| Total Capital Investment (TCI = DC + IC): | | \$413,294 | \$1,146,427 | \$3,555,861 |
| Direct Annual Costs (DAC): | | | | |
| Operating Costs (O): | | | | |
| Operator: | 24 hrs/day, 7 days/week, 50 weeks/yr 1.5 hr/shift | 25 \$/hr for operator pay | | |
| Supervisor: | 15% of operator | | | |
| OAQPS | | \$13,125 | \$13,125 | \$13,125 |
| OAQPS | | \$1,969 | \$1,969 | \$1,969 |
| Maintenance Costs (M): | | | | |
| Labor: | 0.5 hr/shift | 25 \$/hr for labor pay | | |
| Material: | 100% of labor cost: | | | |
| OAQPS | | \$13,125 | \$13,125 | \$13,125 |
| OAQPS | | \$13,125 | \$13,125 | \$13,125 |
| Utility Costs: | | | | |
| Gas usage | 0% thermal eff | 600 (F) operating temp | | |
| Gas cost | 0.0 (MMcf/yr) | 1,000 (Btu/ft ³) heat value | | |
| Perf. loss: | 3,000 (\$/MMcf) | | | |
| Electricity cost | 0.5% | | | |
| variable | 0.06 (\$/kwh) performance loss cost penalty | | | |
| OAQPS | | \$10,584 | \$57,960 | \$405,720 |
| Catalyst replace: | assume 30 ft ³ catalyst per MW, \$400/ft ³ , 7 yr. life | | | |
| OAQPS | | \$388 | \$2,128 | \$14,881 |
| Catalyst dispose: | \$15/ft ³ 30 ft ³ /MW * MW * 2054 (7 yr amortized) | | | |
| OAQPS | | \$388 | \$2,128 | \$14,881 |
| Ammonia: | 360 (\$/ton) [(tons NH ₃ = tons NO _x * (17/46)] | | | |
| variable | | \$3,510 | \$14,820 | \$108,257 |
| NH ₃ inject skid: | 5 (kW) blower | 5 kw (NH ₃ /H ₂ O pump) | | |
| MHIA | | \$5,040 | \$7,560 | \$27,720 |
| Total DAC: | | \$71,219 | \$180,500 | \$994,755 |
| Indirect Annual Costs (IAC): | | | | |
| Overhead: | 80% of O&M | | | |
| OAQPS | | \$24,806 | \$24,806 | \$24,806 |
| Administrative: | 0.02 x TCI | | | |
| OAQPS | | \$8,266 | \$22,929 | \$71,117 |
| Insurance: | 0.01 x TCI | | | |
| OAQPS | | \$4,133 | \$11,464 | \$35,559 |
| Property tax: | 0.01 x TCI | | | |
| OAQPS | | \$4,133 | \$11,464 | \$35,559 |
| Capital recovery: | 10% interest rate, 15 yrs - period | | | |
| OAQPS | 0.13 x TCI | \$52,976 | \$143,272 | \$415,329 |
| Total IAC: | | \$94,314 | \$213,935 | \$582,370 |
| Total Annual Cost (DAC + IAC): | | \$165,533 | \$394,435 | \$1,577,125 |
| NO _x Emission Rate (tons/yr) at 42 ppm: | | 33.4 | 141.0 | 1030.0 |
| NO _x Removed (tons/yr) at 9 ppm, 79% removal efficiency | | 26.4 | 111.4 | 813.7 |
| Cost Effectiveness (\$/ton): | | \$6,274 | \$3,841 | \$1,938 |
| Electricity Cost Impact (\$/kwh): | | 0.489 | 0.204 | 0.117 |

*Assume modular SCR is inserted into existing HRSG spool piece



THE
RUSSELL CITY ENERGY CENTER
COMMUNITY DEVELOPMENT

COMMUNITY DEVELOPMENT

7 BROADWAY



REVISED BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

1998). This value is derived by a formula specified by CTDEP. The Project's maximum emission rate will be 10 ppm, or 43 percent of the allowable MASC limit.

The use of an SCR for NO_x control in combination with an oxidation catalyst for control of CO may increase particulate emissions in the form of ammonium bi-sulfates. Due to the insignificant amount of sulfur in natural gas fuel this impact will be extremely small. During oil-fired operation (the Project will be limited to 720 hours per year of oil-fired operation) the estimated amount of ammonium bi-sulfate emissions will increase particulate emissions by approximately 60 pounds per hour. This increase has only a minor effect on the maximum predicted air quality impacts from the Project, which are well within National Ambient Air Quality Standards.

An environmental benefit of SCR, when combined with a CO Oxidation Catalyst (Section 1.3), is a decrease in emissions of VOCs. Although the Project is not required to include VOCs in the PSD review as discussed in Section 1.1, the use of an SCR and CO Oxidation Catalyst will ensure that VOC emissions are minimal. The reduction in VOC emissions from SCR/CO Oxidation Catalyst is comparable to that from SCONO_xTM.

ENERGY ANALYSIS

Use of SCR for NO_x control has an energy penalty due to the energy required to force combustion gases through the SCR reactor. There are other energy requirements associated with chemical transport and operation of equipment, pumps and motors but these are relatively small. Operation of the SCR for the Towantic Project is estimated to reduce electrical output by 1.46 MW or 11,510 MWh of electricity per year¹. Not only is the electrical output reduced but the fuel use is increased by 135,800 MCF of gas per year.

1.2.4.1.3 ECONOMIC ANALYSIS

Table 3 presents the capital and annualized cost for the SCR control option downstream of a DLN combustor. The costs are itemized to include capital cost of equipment and operation costs for personnel, maintenance, replacement parts (primarily catalyst), energy penalties and ammonia. All costs are for two GE Frame 7FA gas turbine units, each including one HRSG, which includes the SCR unit.

¹ Based on annual capacity factor of 90%.

TOWANTIC ENERGY PROJECT

issues, poses a serious concern as to whether the Project could secure final construction approval from the Council.

As with the SCR/CO Oxidation Catalyst, SCONO_xTM will reduce VOC emissions along with NO_x and CO. The Project is not required to include VOCs in the PSD review, as discussed in Section 1.1, however, SCONO_xTM does have the added benefit of decreasing VOC emissions. The reduction in VOC emissions from SCONO_xTM is comparable to that from SCR/CO Oxidation Catalyst.

1.2.4.2.2 ENERGY ANALYSIS

Use of SCONO_xTM for NO_x control has an energy penalty due to the energy required to force combustion gases through the SCONO_xTM reactor (pressure drop). Pressure drop through the SCONO_xTM unit is estimated at 5.25 inches by the manufacturer. This is compared to approximately 3.5 inches of pressure drop for a combined SCR and CO catalyst installed in a HRSG. The pressure drop of 5.25 inches reduces the total plant output by approximately 2.19 MW or 17,266 MWh per year. Not only is the electrical output reduced but the fuel use is increased by 202,200 MCF of gas per year.

Production of the steam used in the regeneration process also imposes a penalty in that the steam is not available to generate electricity. Based on the manufacturer's estimate of low-pressure steam requirements of 15,000 pounds per hour at 600°F and 20 psig, the steam turbine capability of the Project will be reduced by approximately 2.5 MW or 19,710 MWh per year.

The additional energy requirements of the SCONO_xTM system (relative to other NO_x control technology) means that the incremental amount of energy will not be supplied by the Project to meet energy needs in the service area. Other power plants will make-up the difference (approximately 4.2 MW) and this will result in a proportional increase in air pollution emissions. These other power plants may emit at levels equal to or greater than the Project.

As with any mechanical system, there are energy requirements associated with the operation of equipment, pumps and motors but these are relatively small. Finally, the SCONO_xTM system consumes 200 pounds per hour of natural gas total for regeneration of the catalyst plus leakage. This results in an annual natural gas consumption of 41,800 MCF.

1.2.4.2.3 ECONOMIC ANALYSIS

Table 4 presents the capital and annualized cost for the SCONO_xTM control option downstream of a DLN combustor. The costs are itemized to include capital cost of equipment and operation costs for personnel, maintenance, replacement parts (primarily catalyst) and energy costs. These costs are based on general information provided during a meeting with representatives from ABB Environmental. ABB Environmental was not able to provide a specific cost quote for a SCONO_xTM system for a GE 7FA combustion turbine with a HRSG. The projected capital costs are based on a SCONO_xTM system designed for an ABB GT-24 unit adjusted for the GE 7FA. The SCONO_xTM system also reduces

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 08-01
)
)

DECLARATION OF ROB SIMPSON

I Rob Simpson do hereby declare as follows:

I reside in the city of Hayward where I am raising 3 children, 2 that I sired and 1 who was adopted in Africa as a baby. I serve on the Hayward Area Planning Association. I serve on the City of Hayward's Clean and Green Task Force. I have given nearly 30,000 trees away to the community largely to fight Global Warming. I held my mother as she died from cancer and my father as he died from respiratory failure. I have respiratory difficulty I have seen a map of Co impact from the Air District that marks the vicinity of my home being the maximum impact. I have tried to get information from the Air District and they have not been forthcoming with regards to Dates and permitting actions. I have a recording from the Attorney for the district on my voicemail Dated November 29, 2007 that states the following.

"uh Hi Rob Sandy Crocket at the Bay Area Air Quality Management District. Um Brian Bungler said he got a message from you ah He forwarded it to me, and asked me to get back to you since I'm the ah person handling it here, Um and on the issue of ah the time that you have to file an appeal to the Authority to construct. Um you know I'm not really in a good position to give you legal advice on what your rights are ah to appeal and when you need to do things by. Um I think that if you want a definitive answer on you know what your legal requirements are for filing an appeal here ah I think you need to get your own legal counsel uh I can tell you, you the the ah statutory reference some of them that apply here you could probably look it up for yourself and uh I think you want to be looking in Health and safety code section uh 42302.1 uh and around there you can find some legal authorities uh that may help you out. But as far as giving you definitive legal advice um I just can't do that um in the position that I am in. uh so I hope this clears things up some. I understand that it's not a definitive answer but

you have to understand that I am just not in a position to give you one uh if you have any questions give me a call back at 415-749-4732

I have attached a Community Greenhouse Gas Emissions in 2005 summary report with handwritten notes demonstrating Calpine's plan can emit over 2 times the cities greenhouse gas emissions.

I have spent close to 400 hours involved with these power plant plans.

I apologize to the EAB if my attached "OPPOSITION TO REQUEST FOR SUMMARY DISMISSAL" does not demonstrate the caliber of presentation that it is accustomed to but I believe that the points are clear.

I Hereby declare under the penalty of perjury under the laws of California that the forgoing is true and correct, and that this declaration was executed on February 9, 2008



Rob Simpson

Hayward

Community Greenhouse Gas Emissions in 2005 Summary Report

| | Equiv CO ₂ (tons) | Equiv CO ₂ (%) | Energy (MBtu) |
|----------------|---------------------------------|------------------------------|-----------------------|
| Residential | 184,158 | 24.1 | 2,777,925,461 |
| Commercial | 278,079 | 36.4 | 3,933,435,755 |
| Transportation | 342,581 | 44.8 | 3,993,250,979 |
| Waste | -40,288 | -5.3 | |
| Total | 764,529 | 100.0 | 10,704,612,195 |

Russell City¹

1,681,920 tons/year • 2.19 x H. total emissions

Catshone²

230,000 tons/year • 30% of H. total emissions

¹ run at 80% capacity &
@ 800 lbs of emissions
per Mega Watt

² 4,000 hours/year
@ 1,000 lbs of emissions
per Mega Watt



BOARD OF SUPERVISORS

GAIL STEELE

SUPERVISOR, SECOND DISTRICT

BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In the matter of)
Russell City Energy Center) Appeal No. 08-01
)
)
)

DECLARATION OF GAIL STEELE

I, Gail Steele, hereby declare as follows:

I serve on the Alameda County Board of Supervisors, District 2. My jurisdiction includes the City of Hayward.

If I had received notice of the Bay Area Air Quality Management District's process, with regard to the Russell City Energy Center and the Eastshore Energy Center, I would have participated in the actions.

I would like proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public hearing.

I declare, under penalty of perjury, under the laws of the State of California, that the foregoing is true and correct, and this declaration was executed on February 6, 2008.

Gail Steele





HAYWARD AREA PLANNING ASSOCIATION

September 25, 2007

California Energy Commission

Ms. Jackalyne Pfannestiel, Chair

by fax to Executive Office at 916-654-4420 and Paul Kramer, Hearing Office, 916-654-3897

by email pdf attachment to Jackalyne Pfannestiel <cgraber @ energy.state.ca.us>

Subject: Russell City Energy, Docket 01-AFC-7C for Sept. 26, 2007

Dear Energy Commission:

The Hayward Area Planning Association has serious concerns about the Russell City (Calpine) and East Shore (Tierra) power plants proposed for the Hayward shorelands. These are huge plants in their size and electrical capacity.

While natural gas peaker plants like East Shore are preferable to oil, coal, or new hydro, we believe there are alternatives preferable to natural gas and the severe peaking of electrical demand on hot summer afternoons and on cold winter evenings.

We support not building these two plants. We support, at a minimum, delaying action until substantive and procedural problems are adequately considered by the public, environmental groups, the City of Hayward, Alameda County, the California Energy Commission, and the Bay Area Air Quality Management District. There has not yet been a chance for public consideration of the details of these plants as currently proposed.

The problems are air pollution, misplaced mitigation, hazards to aviation, visual blight, urban heat island effects, use of fossil fuels, and the exclusion of Alameda County from the planning process.

- These plants will cause severe increases in air pollution--particulates, NOx, CO, ROG, SOx, ammonia, other toxic air contaminants. Hayward has no air quality monitoring stations. The Bay trail and the recently purchased salt ponds are nearby. Air pollution will affect recreational users and the Clapper Rail, Snowy Plover, Salt Marsh Harvest Mouse, Least Tern, and other wildlife found within a few miles of the power plants. If the pollution exists, the impacts exist, and should not be superficially dismissed as insignificant by people who don't care about air quality.
- Mitigation measures are inadequate and misplaced, allowing air in and around Hayward to be degraded while pollution credits are used to benefit other areas.

- A plume of hot gases and exhaust rising up to 1,000 feet from proposed exhaust smokestacks 70 feet (Tierra) to 145 feet (Russell) high will pose a hazard to aviation using the Hayward Municipal Airport and, thus, to the public below.
- These proposed exhaust smokestacks, large industrial buildings with cooling towers, and new transmission towers and lines will cause visual blight close to a natural area.
- These plants are not out in some rural area; they are part of the densely populated East Bay plain. Burning natural gas increases local area heat from generating the power and then using it for air conditioning, both of which increase urban heat island temperatures and lead to demand for even more air conditioning--by those who can afford it.
- Burning natural gas produces more greenhouse gases. California and the nation need to decrease use of all fossil fuels and increase the use of alternatives more consistent with sustainability. Air circulation may sometimes reduce the local heat island effect, but the impact on global warming remains the same.
- So far there has been no application to Alameda County for a plant to be built in part in the county.

These plants, if needed at all, should be built where power demand is increasing the most, in Santa Clara and San Mateo counties. They should not be built in places with less increase in demand. Let those most in need bear the external costs. In fact, if the external costs were internalized, these plants would not be proposed in the first place.

There is, however, a better alternative. Electrical needs can be better met with time-of-day pricing, insulation of buildings, fluorescent light bulbs, solar thermal, solar photovoltaic panels, wind energy, energy-efficient industrial motors and household appliances, transit-oriented development, waste cooking oil, and a multitude of additional cost-effective energy conservation strategies. These alternatives reduce fossil fuel use, peak demand, and the need for electricity in general.

Circumstances have changed substantially since these plants were proposed in the midst of an artificial energy crisis. AB 32 is now law. Also, on October 21, 2006, the Governor signed a bill for "a million solar roofs," increasing the effectiveness of PUC policies already in place. Solar roofs alone can supply 3,000 megawatts in California, far more than the 600 megawatts from the Russell City Plant. The Bay Area will get a substantial part of the 3,000 megawatts, and, combined with pricing incentives, sustainable sources, and conservation, alternatives can meet the need for electricity.

The problem is timing. The energy is not really needed now or we would be having brownouts. In the long run alternatives will work. So the problem is how soon the alternatives can be effective relative to the power plants. We know the power plants can be built in a predictable time frame, while opinions vary about alternatives. We believe that stopping the power plants is essential to develop the political will and prices needed to develop the alternative.

We believe there are no technological problems whatsoever with making the alternatives work. There is, similarly, no excuse for building coal or diesel plants.

The shorelands need more protection, not more development. We support conservation, reclamation and preservation of the shorelands in a natural state for habitat, wildlife diversity, and recreational use. HASPA should be strengthened to do its job. Land use designations and zoning should prohibit destructive uses like these power plants.

We need to get off the fossil energy path; we need to get on a sustainable energy path.

Sincerely

Sherman Lewis

Sherman Lewis, President
HAPA
2787 Hillcrest Ave.
Hayward CA 94542
510-538-3692
sherman@csu Hayward.us

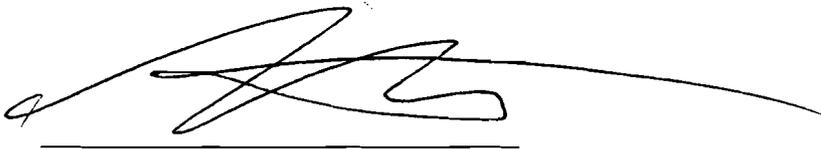
the U.S. Environmental Protection Agency and CARB (California Air Resources Board).

As the RCEC is intended to be run in a **"load following"** profile, which represents a significant change from the "baseload" profile originally permitted in 2001, **it is permitted to start and stop twice per day, with a warm start duration of 3 hours and a cold start duration of 6 hours.**

The Toxic Air Contaminant emissions during these starts and stops were not factored into the public health risk analysis. Instead, this analysis used emission factors associated with normal "baseload" operation when the plant is running at peak efficiency. However, as a "load following" plant, the RCEC may spend a significant number of its daily operating hours either starting up or shutting down. In these inefficient states, where conditions are not optimal for emission controls to function efficiently, **the RCEC will potentially emit Toxic Air Contaminants (Hazardous Air Pollutants) at a rate orders of magnitude higher than under a "normal" operating scenario.**

By omitting the frequent startup and shutdown periods from the public health risk analysis, the BAAQMD **failed to estimate the plant's maximum potential to emit**, and have thus failed to conduct an adequate analysis of the risk to public health of this plant as required by the applicable regulations. Furthermore, by the BAAQMD's own admission during the RCEC evidentiary hearing, **the BAAQMD does not source test for toxic air contaminant emissions during startup and shutdown**, leaving potential health hazards both unpredicted, unmonitored, and thus insufficiently regulated.

I hereby certify under the penalty of perjury under the Laws of California that the forgoing is true and correct, and that this Declaration was executed on February 8, 2008



Michael Toth

BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In the matter of
Russell City Energy Center

Appeal No. 08-01

DECLARATION OF SHANA LAZEROW

I, SHANA LAZEROW, hereby declare:

1. I am an attorney admitted to practice before the courts of the State of California. I am a staff attorney for, serve as counsel for Petitioner Communities for a Better Environment (“CBE”). I have been a CBE staff attorney since November 2005. I am a member of the bar of the State of California, admitted to practice in the Federal Court of Appeals for the Ninth Circuit, and the United States District Court for the Northern, Eastern and Central Districts of California. I have personal knowledge of the matters hereinafter set forth, and if called as a witness would be competent to testify thereto.

2. CBE works in low income communities of color to help those communities self-empower by addressing environmental injustice. Environmental injustice includes the siting of new sources of pollution in already-impacted communities. It often comes about as a result of administrative decisions that are made without adequate notice to the affected community, or without opportunities for the affected community to give testimony concerns the new source’s impacts.

3. CBE has attempted to follow the Bay Area Air Quality Management District (“BAAQMD”) approval process for the Russell City Energy Project in Hayward (“Project”). In September 2001, the Senior Attorney Anne Simon requested notification

of the Preliminary Determination of Compliance for the Project, which alerted BAAQMD that CBE was interested in the Project. A true and correct copy of the e-mail from Anne Simon to BAAQMD staff is attached hereto.

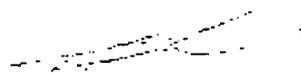
4. It is my understanding that BAAQMD recently issued draft and final Approvals to Construct for the Project. To the best of my knowledge, CBE never received notification of the draft or final approval.

5. Had CBE received such notification, I believe that CBE would have participated in the administrative process. Since we were not notified the process was occurring, CBE did not participate.

6. CBE supports the reopening of the BAAQMD proceedings so that the public has an opportunity to participate.

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

Executed at Oakland, California, on February 7, 2008.



Shana Lazerow

Author: <asimon@cbeval.org> c INTERNET
Date: 9/14/01 9:42 AM
Priority: Normal
TO: Weyman Lee at cc_fs3
Subject: Russell City Energy Center PDOC
Hello,

I am hoping that I will be able to obtain a copy of the Preliminary Determination Of Compliance for the Russell City Energy Project in Hayward as soon as it is released. Please let me know whether I need to make a more formal request, and to whom it should be directed.

Thank you.

Anne Simon

Anne E. Simon
Senior Attorney
Communities for a Better Environment
1611 Telegraph Ave. Suite 450
Oakland, CA 94618
(510) 302-0430
fax: (510) 302-0438

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 09-01
)
)

Declaration of James Forsyth

I hereby declare as follows:

I did not receive notice of the Bay Area Air Quality Management Districts permitting action in regard to Russell City Energy Center AKA Calpine

If I had received notice I would have participated in the public comment action pursuant to my rights within 40cfr124.10 et al.

I would like the proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public Hearing.

I declare, under the penalty of perjury, under the laws of the state of California, that the forgoing is true and correct, and this declaration was executed on

Date 2-07-08

James Forsyth

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 09-01
)
)

Declaration of Ernest A. Pacheco

I hereby declare as follows:

I did not receive notice of the Bay Area Air Quality Management Districts permitting action in regard to Russell City Energy Center AKA Calpine

If I had received notice I would have participated in in the public comment action pursuant to my rights within 40cfr124.10 et al.

I would like the proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public Hearing.

I declare, under the penalty of perjury, under the laws of the state of California, that the forgoing is true and correct, and this declaration was executed on

Date 2/7/8

Ernest A. Pacheco

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 09-01
)
)

Declaration of Audrey A LePell

I hereby declare as follows:

I did not receive notice of the Bay Area Air Quality Management Districts permitting action In regard to Russell City Energy Center AKA Calpine

If I had received notice I would have participated in in the public comment action pursuant to my rights within 40cfr124.10 et al.

I would like the proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public Hearing.

I declare, under the penalty of perjury, under the laws of the state of California, that the forgoing is true and correct, and this declaration was executed on

Date February 8, 2008

Audrey A. LePell

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 09-01
)
)

Declaration of SUSAN M. SILVA

I hereby declare as follows:

I did not receive notice of the Bay Area Air Quality Management Districts permitting action in regard to Russell City Energy Center AKA Calpine

If I had received notice I would have participated in in the public comment action pursuant to my rights within 40cfr124.10 et al.

I would like the proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public Hearing.

I declare, under the penalty of perjury, under the laws of the state of California, that the forgoing is true and correct, and this declaration was executed on

Date 7 FEBRUARY 2008

Susan M. Silva

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 09-01
)
)

Declaration of CYNTHIA PADILLA CHAVEZ

I hereby declare as follows:

I did not receive notice of the Bay Area Air Quality Management Districts permitting action in regard to Russell City Energy Center AKA Calpine

If I had received notice I would have participated in the public comment action pursuant to my rights within 40cfr124.10 et al.

I would like the proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public Hearing.

I declare, under the penalty of perjury, under the laws of the state of California, that the foregoing is true and correct, and this declaration was executed on

Date 2-7-08

Cynthia Padilla Chavez

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 09-01
)
)

Declaration of Clara Watters

I hereby declare as follows:

I provided public comments to the Bay Area Air Quality Management District BAAQMD regarding Russell City Energy Center and Eastshore Energy Center. I received a response from BAAQMD months later dated October 24, 2007 in the form of a letter from Brian Bateman Director of Engineering.

I did not receive notice of the Bay Area Air Quality Management Districts permitting action Dated November 1, 2007 In regard to Russell City Energy Center AKA Calpine despite my above participation in both proceedings.

If I had received notice I would have participated in in the appeal action pursuant to my rights.

I would like the proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public Hearing.

I declare, under the penalty of perjury, under the laws of the state of California, that the forgoing is true and correct, and this declaration was executed on

Date 2-2-2008

Clara Watters

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 09-01
)
)

Declaration of Kimberley FINN

I hereby declare as follows:

I provided public comments to the Bay Area Air Quality Management District BAAQMD regarding Russell City Energy Center and Eastshore Energy Center. I received a response from BAAQMD months later dated October 24, 2007 in the form of a letter from Brian Bateman Director of Engineering.

I did not receive notice of the Bay Area Air Quality Management Districts permitting action Dated November 1, 2007 In regard to Russell City Energy Center AKA Calpine despite my above participation in both proceedings.

If I had received notice I would have participated in in the appeal action pursuant to my rights.

I would like the proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public Hearing.

I declare, under the penalty of perjury, under the laws of the state of California, that the forgoing is true and correct, and this declaration was executed on

Date 2/9/08

Kimberley Finn

**BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON DC**

In the matter of)
Russell City Energy Center) Appeal No. 09-01
)
)

Declaration of Karen Kramer, 2215 Thayer Ave,
Hayward, CA 94545

I hereby declare as follows:

I did not receive notice of the Bay Area Air Quality Management Districts permitting action in regard to Russell City Energy Center AKA Calpine

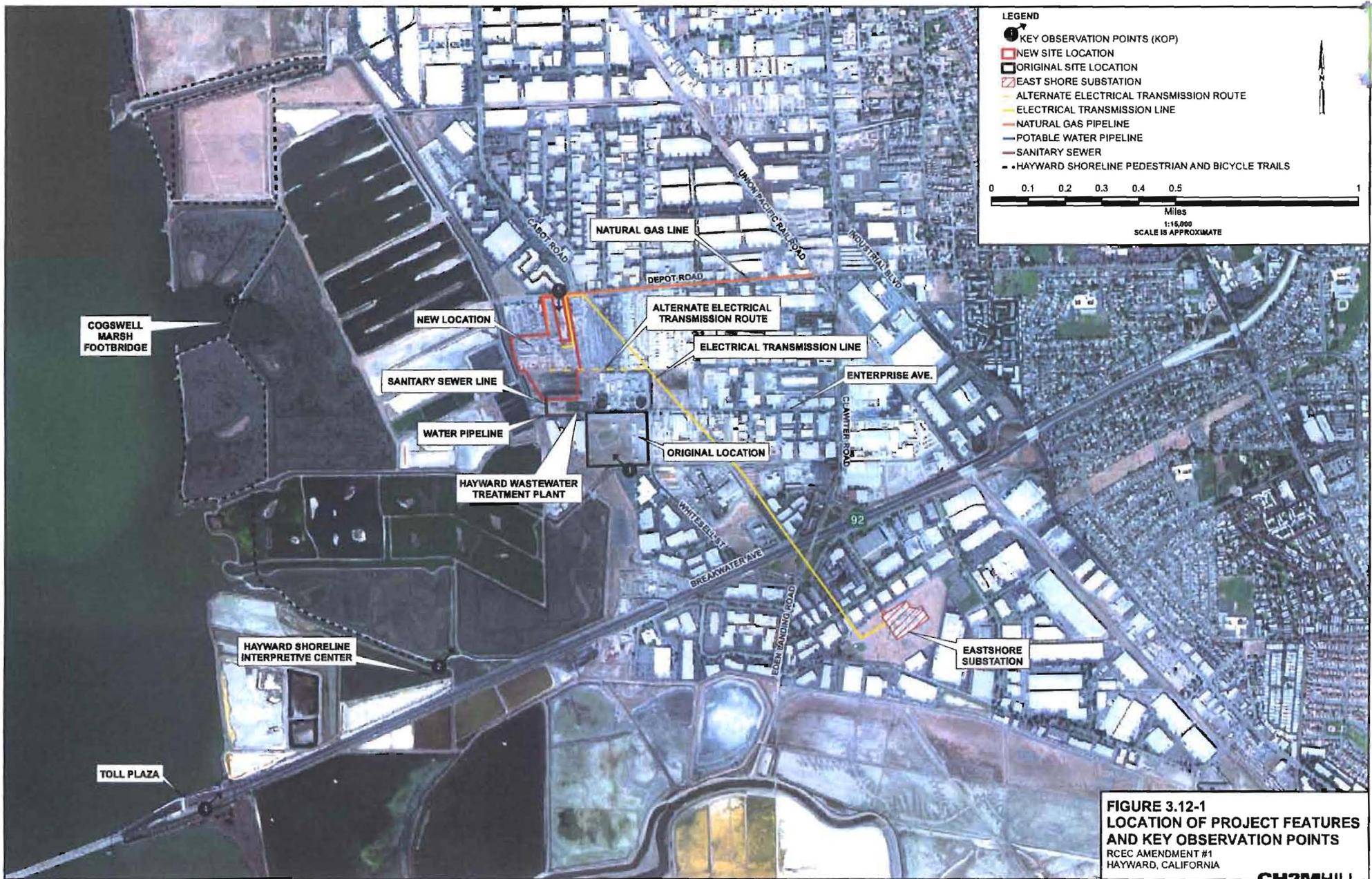
If I had received notice I would have participated in the public comment action pursuant to my rights within 40cfr124.10 et al.

I would like the proceedings to be reopened to provide required notice to the public and affected agencies, consider comments and conduct a public Hearing.

I declare, under the penalty of perjury, under the laws of the state of California, that the forgoing is true and correct, and this declaration was executed on

Date 2/7/08

Karen Kramer



LEGEND

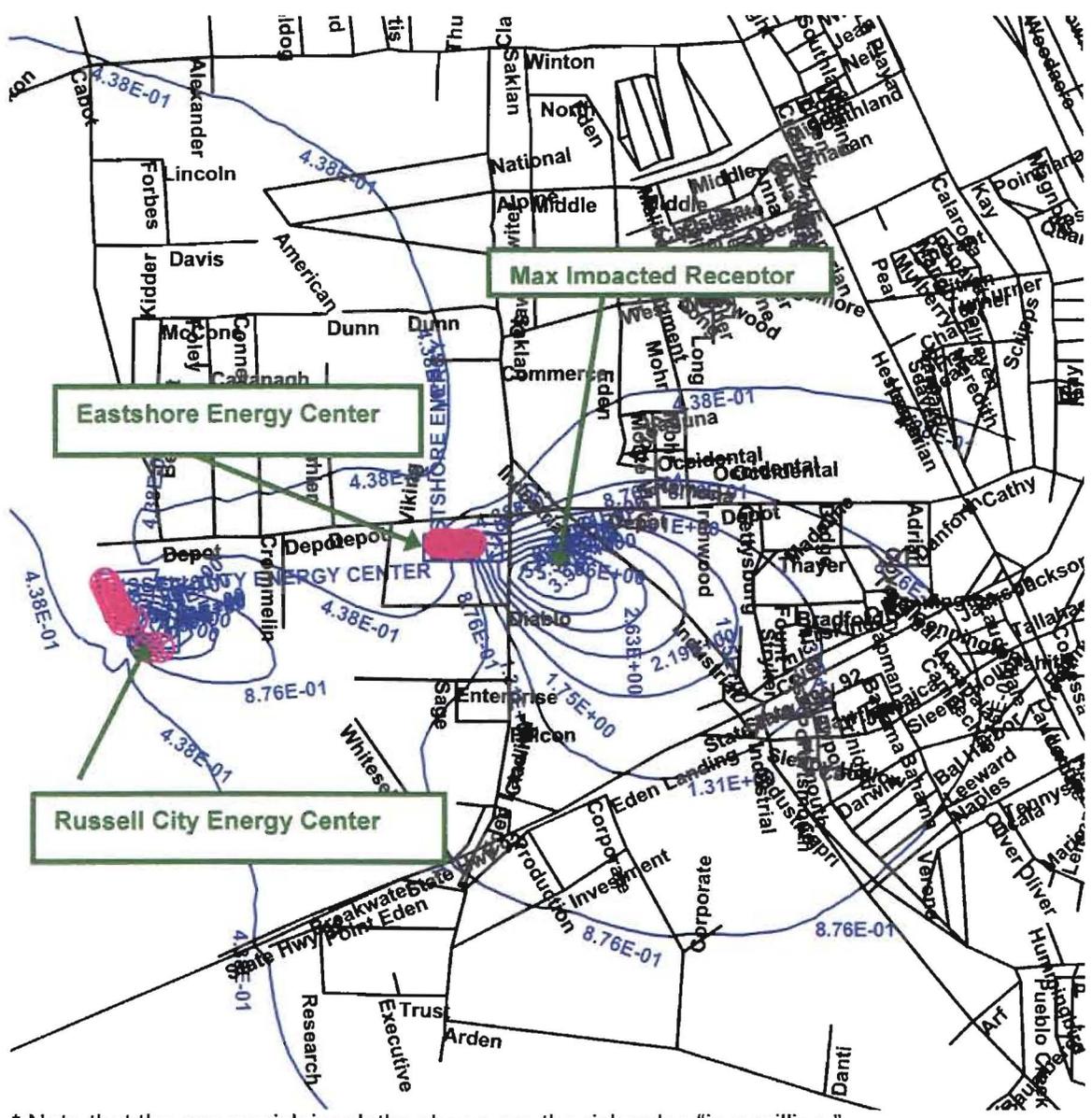
- KEY OBSERVATION POINTS (KOP)
- NEW SITE LOCATION
- ORIGINAL SITE LOCATION
- ▨ EAST SHORE SUBSTATION
- ALTERNATE ELECTRICAL TRANSMISSION ROUTE
- ELECTRICAL TRANSMISSION LINE
- NATURAL GAS PIPELINE
- POTABLE WATER PIPELINE
- SANITARY SEWER
- HAYWARD SHORELINE PEDESTRIAN AND BICYCLE TRAILS

0 0.1 0.2 0.3 0.4 0.5 1

Miles
1:15,000
SCALE IS APPROXIMATE

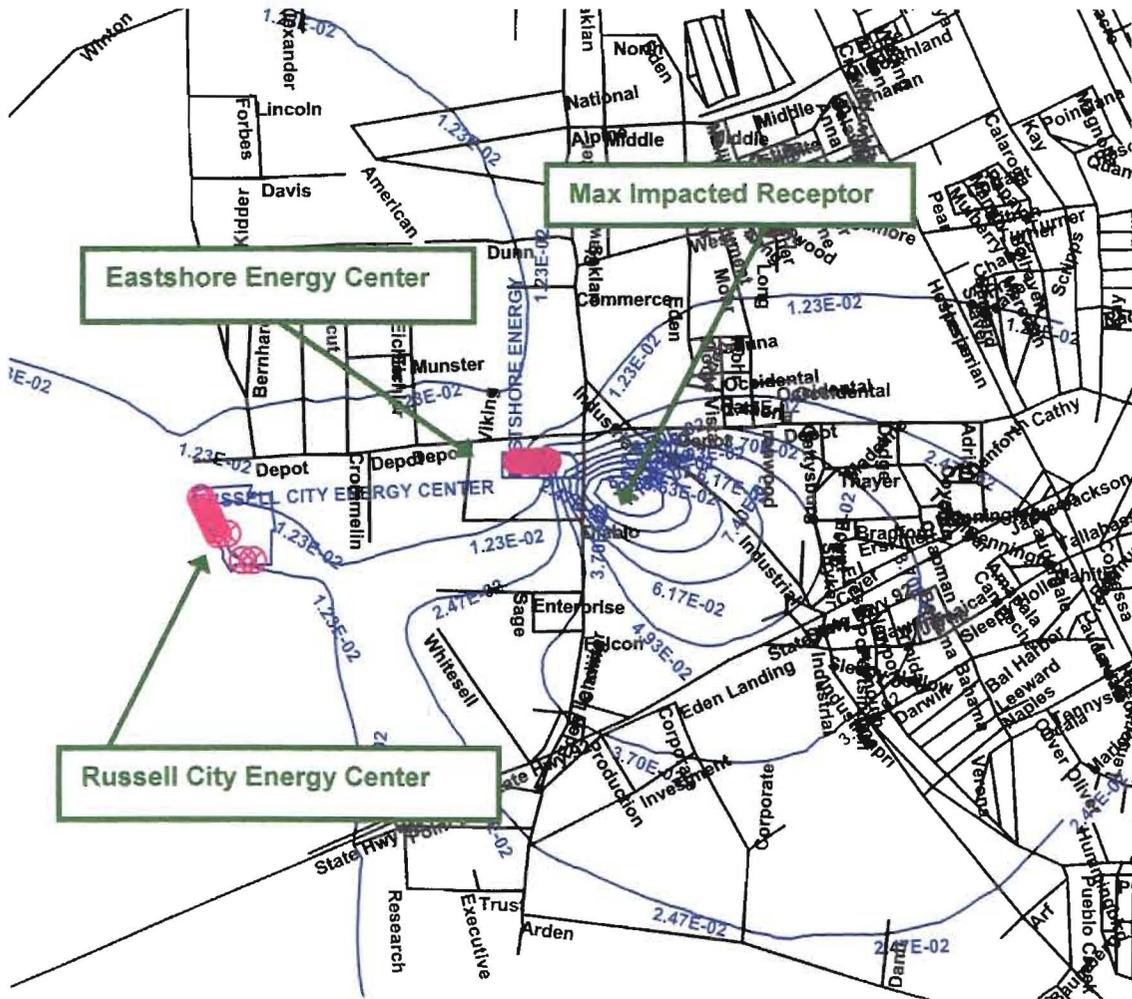
FIGURE 3.12-1
LOCATION OF PROJECT FEATURES
AND KEY OBSERVATION POINTS
 RCEC AMENDMENT #1
 HAYWARD, CALIFORNIA

**PUBLIC HEALTH Figure 6
Cumulative cancer risk isopleths***



* Note that the cancer risk isopleths shown are the risk value "in a million."

PUBLIC HEALTH Figure 7
Cumulative chronic hazard isopleths



PUBLIC HEALTH Figure 8 Cumulative acute hazard isopleths

