Staff Assessment - Part 1 and Part 2
Combined

RUSSELL CITY ENERGY CENTER

Amendment No. 1 (01-AFC-7C)
Alameda County

CALIFORNIA
ENERGY
COMMISSION

STAFF REPORT

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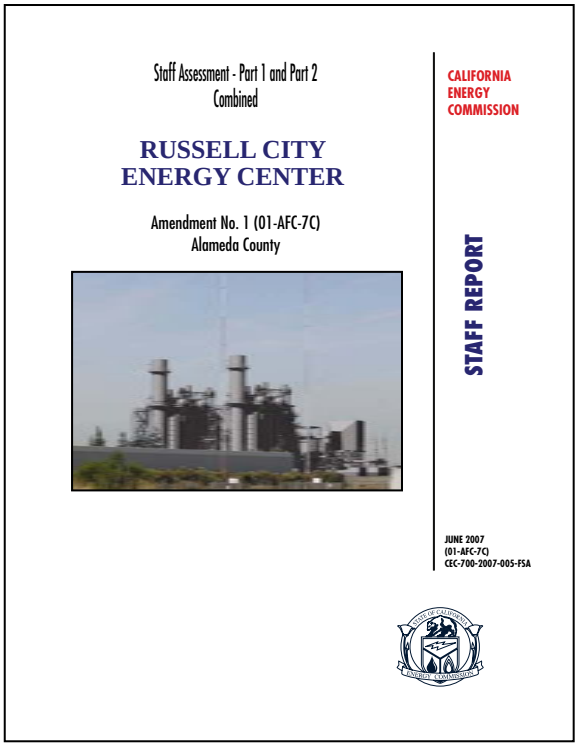

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RUSSELL CITY ENERGY CENTER AMENDMENT #1 (01-AFC-7C)
STAFF ASSESSMENT – PART 1 and 2 (Combined)
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EXECUTIVE SUMMARY

Lance Shaw, Project Manager

INTRODUCTION

On November 17, 2006, the project owner filed a petition with the California Energy Commission to amend the Commission Decision to change the location of the Russell City Energy Center (RCEC). The 600 megawatt project was certified by the Energy Commission on September 11, 2002, to be constructed at a site at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street. The project never received a power purchase agreement, and project construction was never initiated.

The project owner now has a power purchase agreement with Pacific Gas and Electric and is requesting a number of project changes including the approval to move the project to the new site between Depot Road and Enterprise Avenue, approximately 1,300 feet from the original site. The project owner expects to begin construction in the second quarter of 2008. The project would still be located in the City of Hayward**,** in Alameda County.

The purpose of the Energy Commission's amendment review process in this Staff Assessment (SA) is to assess the direct, indirect and cumulative impacts of the amendment on the environment, public health and safety, and the electric transmission system. The SA presents the conclusions, recommendations, and proposed conditions of certification that staff believes are necessary to mitigate or avoid potential significant adverse environmental impacts and to satisfy laws, ordinances, regulations and standards (LORS) that have changed since the original project was certified.

The review process includes an evaluation of the consistency of the proposed changes with the Energy Commission's Decision and with current applicable LORS (Title 20, Calif. Code of Regulations, section 1769).

Staff issued Part 1 of the SA on April 3, 2007. Part 1 contained most of the non-controversial technical sections, including: biological resources; hazardous materials management; noise and vibration; socioeconomic resources; soil and water resources; transmission line safety and nuisance; worker safety and fire protection; facility design; geology and paleontology; power plant efficiency; power plant reliability; and transmission system engineering. This Part 2 SA contains revised Part 1 sections and the following technical area sections which are being released for the first time: air quality; cultural resources; land use; public health; traffic and transportation; visual resources; and waste management. Please see the Executive Summary table below that shows the technical areas included in Part 2 and whether the conditions of certification for that technical area have proposed changes due to the Petition to Amend.

As a result of the Second Revised Committee Scheduling Order, the SA for the Russell City Energy Center (RCEC) amendment is being filed as a complete document.

PROJECT LOCATION AND DESCRIPTION

The Energy Commission certified the construction and operation of the RCEC in September 2002, on 14.7 acres in the City of Hayward (the City) Industrial Corridor at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City's Water Pollution Control Facility (WPCF). The location is approximately two miles from the east entrance to the San Mateo-Hayward Bridge (State Route 92).

Through the Petition to Amend, the project owner is now proposing to locate the facility west of the City's WPCF between Depot Road and Enterprise Avenue, approximately 1,300 feet northwest of the original location (300 feet boundary to boundary). The new location will total approximately 18.8 acres with all parcels located within the City of Hayward.

The proposed amendment includes numerous adjustments to the site layout such as equipment additions, subtractions, and new equipment locations.

A more complete description of the project, including a description and maps of the proposed upgrades to the transmission, water, and natural gas pipeline systems, is contained in the **PROJECT DESCRIPTION** section of this SA. **(See Project Description Figure 1 & 2).**

NECESSITY FOR THE PROPOSED MODIFICATIONS

The project owner requested the proposed modifications because, following the certification of RCEC, portions of the original project location were no longer feasible to acquire. Additionally, property became available that was not previously available in a location that would reduce environmental impacts.

Specifically, with the new location there would be no need to move the KFAX radio towers, thus eliminating the impact on a seasonal wetland and the endangered salt marsh harvest mouse located on that parcel. Further, the proposed relocation eliminates the impact that would have occurred from relocating the KFAX radio towers adjacent to East Bay Municipal Regional Park District facilities and a Hayward Shoreline Regional Park trailhead. Visually, the new location reduces visual impacts from State Route 92 and the Hayward Shoreline Interpretive Center, and eliminates the need for an architectural screen.

PROJECT FUNDING AND OWNERSHIP

Russell City Energy Company, LLC, is jointly owned by Calpine Russell City, LLC (a wholly owned indirect subsidiary of Calpine Corporation) (65%) and Aircraft Services Corporation (a wholly owned indirect subsidiary of General Electric Company) (35%).

SUMMARY OF TECHNICAL AREAS

The Executive Summary table below shows all the technical areas contained in the SA and indicates where staff has recommended changes to the existing RCEC Decision and conditions of certifications. The details of the proposed condition changes can be found under their appropriate headings in this SA.

Executive Summary Table
Summary of Technical Sections Conditions of Certification

Technical Area	Changes to Conditions of Certification	Technical Area	Changes to Conditions of Certification
Biological Resources	Yes	Worker Safety/Fire Protection	Yes
Hazardous Materials Mgmt.	Yes	Facility Design	Yes
Noise and Vibration	Yes	Geology and Paleontology	Yes
Socioeconomic Resources	Yes	Power Plant Efficiency	No
Soil and Water Resources	Yes	Power Plant Reliability	No
Transmission Line Safety and Nuisance	Yes	Transmission System Engineering	Yes
Cultural Resources	Yes	Public Health	Yes
Air Quality	Yes	Visual Resources	Yes
Waste Management	Yes	Traffic and transportation	Yes

STAFF RECOMMENDATIONS AND CONCLUSIONS

Staff believes that approving the proposed changes to the existing conditions will reduce the potential impacts of the proposed project changes in this petition to amend to less than significant levels, with the possible exception of a potential aviation safety hazard affecting land use and traffic and transportation.

Staff is soliciting input from several agencies with aviation expertise and/or jurisdictional responsibilities regarding the potential aviation safety hazard that could result from thermal plumes rising from the heat recovery steam generator (HRSG) stacks and from the cooling tower. These emissions come from project structures which are located in the Hayward Airport approach zone. As a result, commission staff is not prepared at this time to recommend project approval.

Staff will produce supplements to the land use and traffic and transportation sections that incorporate revisions based on the comments received. Staff anticipates filing this supplement on July 18, consistent with the Second Revised Committee Scheduling Order.

INTRODUCTION

Lance Shaw

PURPOSE OF THIS REPORT

The Staff Assessment (SA) presents the California Energy Commission (Energy Commission) staff's independent analysis of the Russell City Energy Center, LLC's (RCEC) Amendment No.1. This SA is a staff document. It is neither a Committee document, nor a draft decision. This complete SA contains both SA Parts 1 and 2.

The SA describes the following:

- the existing environmental setting;
- the proposed project changes;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);
- the environmental consequences of the project including potential public health and safety impacts;
- cumulative analysis of the potential impacts of the project, along with potential impacts from other existing and known planned developments;
- mitigation measures proposed by the project owner, staff, and interested agencies that may lessen or eliminate potential impacts; and
- the proposed conditions of certification under which staff recommends the project be constructed and operated.

The technical area analyses contained in this SA are based upon information from: 1) the Energy Commission Decision (Decision); 2) Petition to Amend; 3) responses to data requests; 4) supplementary information from local and state agencies and interested individuals; 5) existing documents and publications; and 6) independent field studies and research. The analyses for most technical areas include discussions of proposed changes and additions to the conditions of certification. Each proposed condition of certification is followed by a proposed means of "verification." The verification is not part of the proposed condition. It is the Energy Commission staff's method of ensuring post-certification compliance with adopted requirements.

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code section 25500 et seq. and Title 20, California Code of Regulation section 1701 et seq.(specifically section 1769 pertaining to amendments), and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

Section 1769(a)(3) authorizes the Commission's approval of the amendment petition if it can make the following findings:

(A) The findings specified in section 1755 (c) [whether all significant environmental impacts can be mitigated or avoided], and (d) [if all significant impacts cannot

be avoided, overriding considerations justify approving the amendment], if applicable;

(B) That the project would remain in compliance with all applicable laws, ordinances, regulations, and standards, subject to the provisions of Public Resources Code section 25525;

(C) The change will be beneficial to the public, project owner, or intervenors; and

(D) There has been a substantial change in circumstances since the Commission certification justifying the change or that the change is based on information that was not available to the parties prior to Commission certification.

The SA contains an Executive Summary, Introduction, Project Description, and the environmental, engineering, and public health and safety analysis of the proposed amendment. The technical areas included in this SA are as follows: air quality; biological resources; cultural resources; hazardous material management; land use; noise and vibration; public health; socioeconomic resources; soil and water resources; traffic and transportation; transmission line safety and nuisance; visual resources; waste management; worker safety and fire protection; facility design; geology and paleontology; power plant efficiency; power plant reliability; reconductoring and transmission system engineering.

Each of the technical area assessments includes a discussion of:

- LORS;
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- conclusions and recommendations; and
- conditions of certification for both construction and operation (if applicable).

Staff has added new conditions of certification and in some cases modified or deleted some of the existing conditions of certification contained in the Decision for the RCEC. With one exception, implementing the modified and existing conditions along with the mitigation measures proposed by the project owner will ensure that the proposed relocation and other site changes would result in no significant environmental impacts. That exception is in the area of traffic and transportation. Where conditions of certification have changed from the original Decision staff displays the revised information in <u>underline</u> (new text) and ~~strikeout~~ (deleted text).

ENERGY COMMISSION AMENDMENT PROCESS

The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, §25500). The Energy Commission must review Petitions to Amend

the Decision to assess potential environmental and public health and safety impacts, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws and standards (Pub. Resources Code, §25523 (d)).

The Energy Commission's siting regulations require staff to independently review the Petition to Amend and assess whether the list of environmental impacts it contains is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, §§ 1742 and 1742.5(a)). Staff's independent review is presented in this report (Cal. Code Regs., tit. 20, §1742.5).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, § 1743(b)). Staff is required to coordinate with other agencies to ensure that applicable LORS are met (Cal. Code Regs., tit. 20, § 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of CEQA. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification and amendment program has been certified by the Resources Agency (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other applicable portions of CEQA.

Staff uses the SA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the SA and errata, staff will conduct one or more workshops to discuss the findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshops and written comments, staff will refine its analyses, correct errors, and finalize conditions of certification to reflect areas where staff has reached agreement with the parties. These refined analyses, along with responses to written comments on the SA, will be published in an errata.

The Siting Committee has oversight over compliance issues for the Energy Commission and has elected to oversee the RCEC amendment petition. All parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties at one or more Committee hearings, thereby creating a hearing record on which a decision on the amendment can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed amendment may be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is circulated to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. If there is a revised PMPD, it will be circulated for a comment period to be determined by the Committee. At the close of that comment period, the PMPD would be submitted to the full Energy Commission for a decision.

The Energy Commission staff has made a substantial effort to notify interested parties, encourage public participation and notify property owners within 1000 feet of the RCEC project and 500 feet of the linear facilities (electrical and gas transmission and water inflow lines). The Energy Commission staff has:

- Mailed Notices of Receipt on December 1, 2006, to interested parties, local libraries, responsible and trustee agencies and to property owners within 1000 feet of the RCEC project and 500 feet of the transmission line, and,
- Mailed a Notice of Public Hearing and Site Visit, which was conducted on December 15, 2006, to responsible and trustee agencies, Hayward Unified School District (Superintendent) and its 30 schools, PTA organizations in Hayward, local government and officials, property owners within 1000 feet of the RCEC project and 500 feet of the transmission line, the Hayward Public Library, as well as environmental, community-based and labor organizations.

Agency Coordination

As noted above, the Energy Commission approval is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). However, the Commission typically seeks comments from, and works closely with, other regulatory agencies that administer LORS that may be applicable to proposed projects or would have had permitting authority except for the Energy Commission's exclusive jurisdiction to permit thermal power plant 50 megawatts or larger. These agencies include the City of Hayward, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Department of Fish and Game, California Air Resources Board, Department of Toxic Substances Control, the Regional Water Quality Control Board, and the Bay Area Air Quality Management District.

PROJECT DESCRIPTION

Testimony of Lance Shaw

INTRODUCTION

On November 17, 2006, the Russell City Energy Company, LLC (project owner) filed a petition with the California Energy Commission to modify the Russell City Energy Center Project (RCEC). The 600 megawatt project was certified by the Energy Commission on September 11, 2002, and is expected to begin construction in the second quarter of 2008. The facility will be located in the City of Hayward**,** in Alameda County.

The petition contains several modifications, the most notable being the relocation of the project facilities approximately 1300 feet northwest of the original location. Proposed modifications are described below.

PROJECT LOCATION

Following the completion of the certification process in September 2002, the project owner was granted permission by the Energy Commission to construct the RCEC in the City of Hayward's (the City) Industrial Corridor at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City's Water Pollution Control Facility (WPCF), approximately two miles from the east entrance to the San Mateo-Hayward Bridge (State Route 92). This location consisted of 14.7 acres and would have accommodated generation facilities, an advanced water treatment facility, control and administration building, emission control equipment, storage tanks, parking area, and storm water detention basins. One of the parcels at the original location includes four radio towers currently used for radio transmission by the KFAX-AM radio station which would have been relocated.

The facility will be located west of the City's WPCF, adjacent to and south of Depot Road in the east Hayward industrial area. Cabot Road has its southern terminus at Depot Road across from the northeast corner of the project's new location. Enterprise Avenue lies to the south of the new site boundary. The proposed new location is approximately 1,300 feet northwest of the original location (300 feet boundary to boundary). The new location is approximately 1.0 mile east of the eastern shoreline of South San Francisco Bay and will total approximately 18.8 acres; consisting of four parcels. As of March, 5, 2007, all four properties that make up the proposed project site are now within the City of Hayward. See **PROJECT DESCRIPTION Figures 1 and 2** for the local setting of this proposed location.

PROJECT FACILITIES

The proposed RCEC would include two Siemens Westinghouse "F-class" combustion turbine generators (CTGs) equipped with dry, low oxides of nitrogen (NOx) combustors and steam injection capability; two heat recovery steam generators (HRSG); a single condensing steam turbine-generator (STG); a dearerating surface condenser; a mechanical draft hybrid (wet/dry); plume-abated cooling tower; and, support equipment.

Each HRSG unit would have a 145-foot exhaust stack and would be equipped with duct burners for additional steam production when increased electric power generation is necessary. The proposed project will be designed to operate in a load following mode; whereas the project as licensed was designed to operate as a base load facility. See **PROJECT DESCRIPTION Figure 1 (**2.1-2 in the Petition to Amend) for the facility and equipment configuration of the proposed project.

To control emissions of air pollutants, RCEC would have gas turbines with dry, low nitrogen oxide (NOx) burners. The units would use the best available control technology (BACT) including selective catalytic reduction (SCR) for control of NOx. The SCR system consists of a reduction catalyst and an aqueous ammonia injection system.

AIR QUALITY EMISSIONS

The amendment proposes increases in emissions and emissions limits due to changes in turbine rated fuel capacities, fuel specifications, start-up and shutdown frequencies and durations, cooling tower water quality, and lessons learned from commissioning other combined cycle power plants. Short-term emission limits for nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs also referred to as POC), sulfur oxides (SOx), ammonia (NH_3), and particulate matter less than 10 and 2.5 microns (PM10 and PM2.5) are affected by the amendment request.

However, annual emissions limits and District-required emission reduction credit quantities (offsets) are unchanged in the amendment request. The amendment proposes to modify the PM10 Mitigation Plan (Energy Commission required mitigation) to include emission reduction credits as an option. The project will use BACT to control NOx, VOCs, sulfur dioxide (SO_2), and PM10)/2.5 emissions.

TRANSMISSION LINE AND NATURAL GAS FACILITIES

The natural gas pipeline route and a small portion (approximately 500 to 1,000 feet) of the transmission line route would be re-located. Natural gas would be delivered to the new location via a new gas line from Pacific Gas and Electric Company's (PG&E) line 153 located along the Union Pacific Railroad easement to the east of the project. The natural gas pipeline would run entirely under Depot Road to the easement for a distance of approximately 3,800 feet (0.7 mile). Gas compressors and a metering station are located at the north end of the project site.

The proposed new 230 kV transmission line would run in the existing 115 kV Grant-Eastshore transmission corridor between the RCEC and the PG&E Eastshore substation. (The use of the existing PG&E corridor remains unchanged.) There are two alternatives for the new route, Alternative 1 and Alternative 2 which are shown on **PROJECT DESCRIPTION Figure 2.**

Alternative 1 would extend from the RCEC switchyard east to the eastern edge of the RCEC property and then north towards Depot Road. It would then turn east and run approximately 230 feet to the existing Grant-Eastshore 115 kV corridor. The remaining portion of the generation tie-line would run parallel to the existing 115 kV line for approximately 6,780 feet to the Eastshore substation. The entire Alternative 1 generation

tie-line route from the RCEC property to the Eastshore substation would be approximately 7,010 feet (1.3 miles) long.

Alternative 2 would run from the RCEC switchyard east to the eastern edge of the RCEC property and then south to the southern edge of the RCEC property. It would then turn east and run approximately 950 feet along the southern boundary of several parcels that face Depot Road (also the northern boundary of the City of Hayward WPCF), to the Grant-Eastshore 115 kV transmission corridor. The segment from the existing Grant-Eastshore 115 kV transmission corridor to the Eastshore substation will be approximately 5,460 feet. This entire route would be approximately 6,410 feet (1.2 miles) long.

TRANSMISSION SYSTEMS IMPROVEMENTS

The original System Impact Study (SIS) for the RCEC identified impacts to the Eastshore-San Mateo 230 kV transmission line with the addition of the RCEC, and indicated that it would be necessary to reconductor this line. The updated SIS has, in addition, identified a need for reconductoring seven miles of the Eastshore to Dumbarton 115 kV transmission line. Permitting of these actions falls under the jurisdiction of the California Public Utilities Commission because they will take place beyond the first point of the RCEC's interconnection with the electric grid.

WATER SUPPLY AND WASTE WATER TREATMENT

The City's WPCF would provide secondary effluent for the process water supply. A Zero Liquid Discharge (ZLD) system, which would be placed to the west of the switchyard, and a Title 22 Recycled Water Facility (RWF), which would be located east of the power block, would be added to the new location to replace the proposed Advanced Water Treatment facility (AWT).

Water required for domestic uses and fire fighting would also be provided by the City through a new connection from the southern boundary of the project site to the existing 12-inch potable water line that runs along Enterprise Avenue. The quantities of water used would remain nearly the same as under the original design. The quantities of wastewater produced would decrease significantly with the addition of the ZLD system.

SITE LAYOUT

There would be numerous minor adjustments made to the site layout at the new location that can be grouped into either (1) equipment additions or subtractions and (2) new equipment locations.

Equipment additions or subtractions, compared with the project as licensed, are as follows:

- The standby generator has been removed from the project.
- The architectural treatment has been removed from the project.
- A cooling tower chemical feed pavilion has been placed south of the ZLD area, to the east of the cooling tower.

- The stormwater retention basin has been removed from the project.
- A single recycled water storage tank replaces the two final product water storage tanks.
- One of the two demineralized water storage tanks has been removed from the project.
- The cooling tower now has nine cells instead of ten cells.

The following are changes in equipment locations, compared with the project as licensed:

- The facility has been moved approximately 1,300 feet to the northwest (less than 300 feet boundary to boundary).
- The cooling tower has been realigned from a north-south orientation to a northwest-southeast orientation.
- The administration/control building area has been moved to the southwestern corner of the project site.
- The aqueous ammonia tank has moved to the southeastern corner of the project in between the eastern combustion turbine and the RWF.
- A recycled water storage tank has been placed adjacent to the northeast corner of the power block, southeast of the proposed switchyard.
- A reclaimed water storage tank has been placed adjacent to the northeast corner of the power block, south of the proposed switchyard.
- The demineralized water storage tank has been placed to the northwest of the power block, adjacent to the cooling tower.
- The fire water storage tank has been placed in the northwest corner of the power block.
- The fire pumps have been moved to the northwest corner of the power block adjacent to the fire water storage tank.
- The warehouse has been placed at the northern end of the project site.
- The fuel gas yard and compressor area have been moved to the north end of the project location, just north of the switchyard, and adjacent to the warehouse (a separate PG&E gas metering yard will be located adjacent to Depot Road).
- The gas compressors are now located outdoors instead of inside a building.
- The steam turbine has been moved north slightly so that it is parallel to the combustion turbines.
- The laboratory and sample panel has been separated from the administration building and is now located in an enclosure under the east-west pipe rack.
- The water treatment equipment has been separated from the administration building with water treatment equipment now located in a pavilion north of the ZLD area and cycle chemical feed systems located in a pavilion east of the administration building.

- The unit auxiliary transformers and power distribution center are now located at the east end of the east-west pipe rack, whereas previously they were located just south of the CTG generator step-up transformers.

- The combustion turbine inlet air filters are now located above the generators instead of east of the respective combustion turbines.

CONSTRUCTION AND OPERATION

RCEC, LLC, proposes construction to begin on the project in the second quarter of 2008 and take approximately 25 months. Commercial operation of RCEC is expected to begin by the summer of 2010. The construction work force necessary for RCEC is expected to peak at 650 workers in month 14. Once the new units are on line, the operational staff required is expected to be about 25 employees. The capital cost of the RCEC project is expected to be approximately $600 million.

FACILITY CLOSURE

The planned life of the RCEC facility is 30 years or longer. Whenever the facility is closed, either temporally or permanently, the closure procedures would follow the described plan provided in the Commission Decision and any additional LORS in effect at that time.

REFERENCES

Calpine/Bechtel, Application for Certification (AFC), Volumes 1 and 2 (Appendices), submitted to the California Energy Commission on May 22, 2001.

California Energy Commission Final Staff Assessment (FSA) and Addendum, Comments on the FSA, published on June 10, 2002.

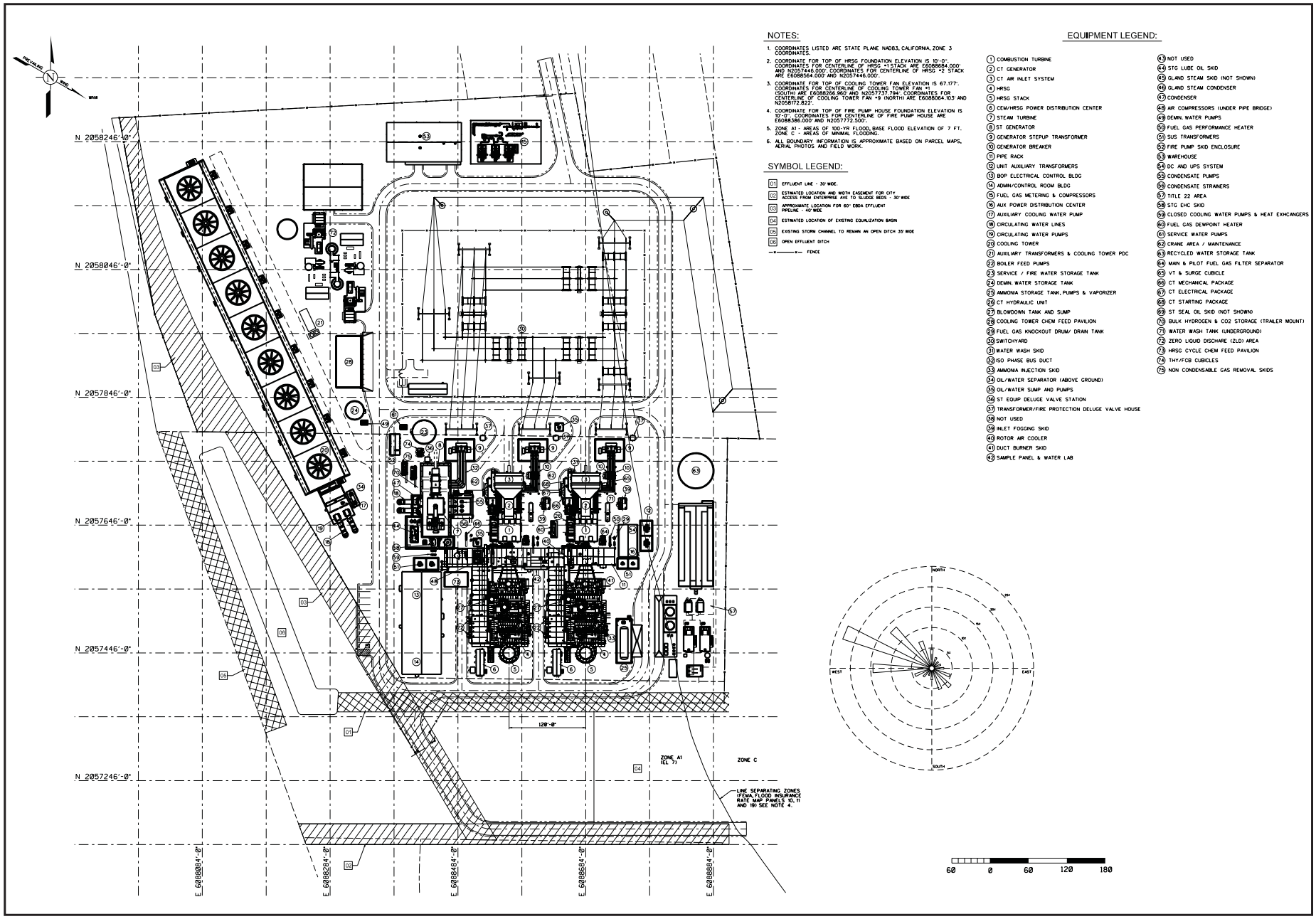
California Energy Commission Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002.

Russell City Energy Company, LLC, Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.

California Energy Commission Staff Assessment Part 1, filed by staff April 3, 2007.

PROJECT DESCRIPTION - FIGURE 1

Russell City Energy Center Amendment #1

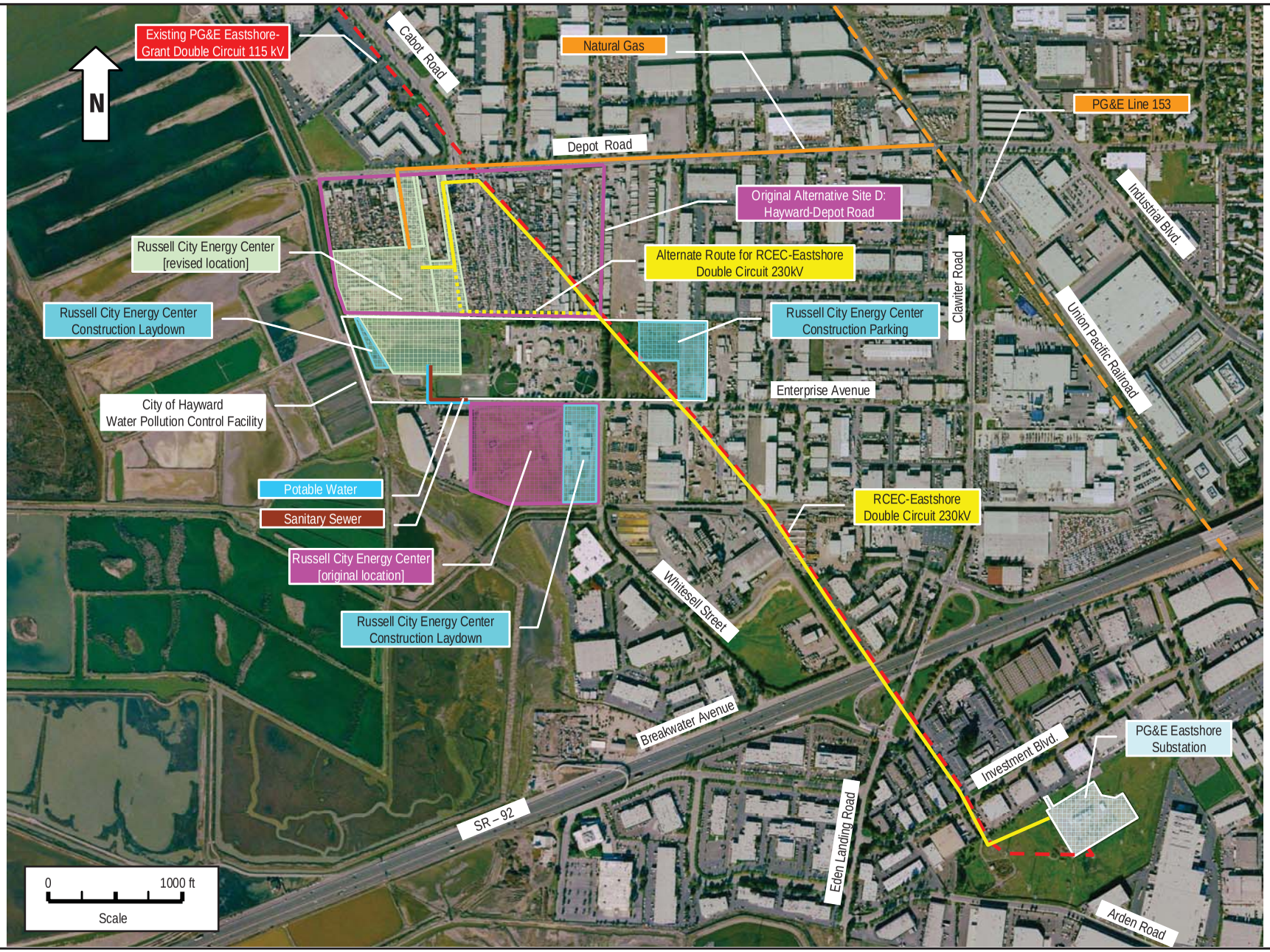


CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2007

SOURCE: RCEC Amendment #1

PROJECT DESCRIPTION - FIGURE 2

Russell City Energy Center Amendment #1



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2007

SOURCE: RCEC Amendment #1

ENVIRONMENTAL ASSESSMENT

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 (NOx) 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 (NO_2), sulfur dioxide (SO_2), 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/PM2.5) emissions contribution would be mitigated to a level that is less than significant by the surrender of sulfur oxides and PM10/PM2.5 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' NOx 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 NOx, POC, CO, sulfur dioxide (SOx), and PM10 and PM2.5 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 (NOx)	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 (NOx, POC and SOx) 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 ($\mu g/m^3$). 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 % O_2) 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 slighty 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 secondary[1] 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, and15355.)

[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 NOx, CO, POC, SOx and PM10/PM2.5 (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 NOx, POC, PM10, SOx 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 Emissions [6]					
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 NO_2, CO or SO_2 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 ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impacts ($\mu g/m^3$)	Standard ($\mu g/m^3$)	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 855[2]). 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).

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 percent[3] 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 proposed[4]. 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 start[5]. 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 emissions[6]. 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 daily[7] 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 lbs[8], 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 NO_2, such start-up scenarios should be allowed (CH2MHILL 2007a).

Even though the modeling shows that the NO_2 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 analysis[10] 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 year[11]. 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 SO_2, 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 SO_2 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 SO_2 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 (N_20, not NO or NO_2, which are commonly know as NOx or oxides of nitrogen), and methane (unburned natural gas). Also included are sulfur hexafluoride (SF_6) 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 ***OR***	86.8	---	43.3	**43.4** "**wintertime" tons** (if woodstove and fireplace replacement program is successfully implemented)
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 SO_2 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 (SB1368[12]) 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 0.5metric tons) CO_2 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 http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm

[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 NOx, POC, SOx and PM10/PM2.5 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 NO_2, SO_2, or CO ambient air quality standards, and therefore, the project direct NOx, SOx and CO emission impacts are not significant.

- Without proper mitigation, the project NOx 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 SOx 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 SOx 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 AQCMM 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 NOx per day and 157 lbs of POC during the June 1 to September 30 periods. In addition, NOx 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 NOx 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 SOx or SOx-equivalent emission reduction credits (ERCs) from certificate 989, 28.5 tons per year of POC ERCs, and 154.8 tons per year of NOx, or an equivalent combination of NOx 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 CO_2 and CH_4 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 CO_2 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 CO_2, CH_4 and N_2O emissions using the appropriate fuel-based carbon content coefficient (for CO_2) and the appropriate fuel-based emission factors (for CH_4 and N_2O).

The project owner shall convert the N_2O and CH_4 emissions into CO_2 equivalent emissions using the current IPCC Global Warming Potentials (GWP). The project owner shall maintain a record of all SF_6 that is used for replenishing on-site transformers. At the end of each reporting period, the project owner shall total the mass of SF_6 used and convert that to a CO_2 equivalent emission using the IPCC GWP for SF_6. 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 CO_2 equivalent emission using the IPCC GWP.

On an annual basis, the project owner shall report the CO_2 and CO_2 equivalent emissions from the described emissions of CO_2, N_2O, CH_4, SF_6, PFCs, and HFCs.

Verification: The project annual GHG emissions shall be reported, as a CO_2 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.

Permit Conditions

(A) Definitions:

Clock Hour:	Any continuous 60-minute period beginning on the hour
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf
Rolling 3-hour period:	Any consecutive three-hour period, not including start-up or shutdown periods
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in minutes
MM BTU:	million British thermal units
Gas Turbine Warm and Hot Start-up Mode:	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)**
Gas Turbine Cold Start-up Mode:	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)**
Gas Turbine Shutdown Mode:	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
Gas Turbine Combustor: Tuning Mode	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.
Gas Turbine Cold Start-up:	A gas turbine start-up that occurs more than 72 hours after a gas turbine shutdown

Gas Turbine Hot Start-up:	A gas turbine start-up that occurs within 8 hours of a gas turbine shutdown
Gas Turbine Warm Start-up:	A gas turbine start-up that occurs between 8 hours and 72 hours of a gas turbine shutdown
Specified PAHs:	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 Benzo[a]anthracene Benzo[b]fluoranthene Benzo[k]fluoranthene Benzo[a]pyrene Dibenzo[a,h]anthracene Indeno[1,2,3-cd]pyrene
Corrected Concentration:	The concentration of any pollutant (generally NO_x, CO, or NH_3) 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% O_2 by volume on a dry basis
Commissioning Activities:	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
Commissioning Period:	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.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CPM:	California Energy Commission Compliance Program Manager
RCEC:	Russell City Energy Center

(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).

NO_x (as NO_2)	4,805 pounds per calendar day	400 pounds per hour
CO	20,000 pounds per calendar day	5,000 pounds per hour
POC (as CH_4)	495 pounds per calendar day	
PM10	432 pounds per calendar day	
SO_2	298 pounds per calendar day	

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 SO_2 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 NO_2) 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 NO_2) 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% O_2, 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% O_2, averaged over any rolling 3-hour period. (BACT for CO)

(e) Ammonia (NH_3) emission concentrations at P-1 and P-2 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O_2, 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 CH_4) 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 (SO_2) 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 proceeding 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	**Cold Start-Up Combustor Tuning**	**Hot Start-Up**	**Warm Start-Up**	**Shutdown**
	lb/start-up	**lb/start-up**	**lb/start-up**	**lb/shutdown**
NO_x (as NO_2)	480.0	125	125	40
CO	5,028	2514	2514	902
POC (as CH_4)	83	35.3	79	16

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 NO_2) 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 CH_4) per day	(Cumulative Emissions)
(e)	626 pounds of PM10 per day	(PSD)
(f)	74 pounds of SO_2 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 NO_2) per year	(Offsets, PSD)
(b)	389.3 tons of CO per year	(Cumulative Increase, PSD)
(c)	28.5 tons of POC (as CH_4) per year	(Offsets)
(d)	86.8 tons of PM10 per year	(Cumulative Increase, PSD)
(e)	12.2 tons of SO_2 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:

formaldehyde	10,912 pounds per year
benzene	226 pounds per year
Specified polycyclic aromatic hydrocarbons (PAHs)	1.8 pounds per year

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 (O_2) 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 NO_2), 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 NO_2), 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 NO_2) 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 NO_2), 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 NO_2) 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 (SO_2) 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 SO_2 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 SO_2 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 NO_2); 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 $\leq$ 6.4 pounds/year and 2.9 pounds/hour
Formaldehyde $<$ 30 pounds/year and 0.21 pounds/hour
Specified PAHs $\leq$ 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 $\mu g/m^3$) 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)(I), 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) where 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) where 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 RCEC 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 RCEC 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 DECEMP 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 NOx 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-NOx combustors, the installation and operation of the SCR systems and oxidation catalysts, the installation, calibration, and testing of the CO and NOx 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, NOx mass emission rates, carbon monoxide mass emission rates, and NOx 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 NOx 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).~~

~~NOx (as NO_2)~~	~~7,880 pounds per calendar day~~	~~400 pounds per hour~~
~~CO~~	~~17,716 pounds per calendar day~~	~~584 pounds per hour~~
~~POC (as CH_4)~~	~~230 pounds per calendar day~~	
~~PM_{10}~~	~~456 pounds per calendar day~~	
~~SO_2~~	~~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 NOx, 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 2,179.4 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). (PSD[15] for NOx)~~

~~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 NOx)~~

~~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 NOx)~~

~~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 NOx)~~

~~**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 NOx)~~

~~(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 NOx)~~

~~(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	18
Carbon Monoxide (CO)	2,514	902	43.8
Precursor Organic Compounds (as CH_4)	48	16	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 NOx (as NO_2) per day~~	~~(CEQA)~~
~~(b)~~	~~**7,882 POUNDS OF CO PER DAY**~~	~~(PSD)~~
~~(c)~~	~~230 pounds of POC (as CH_4) per day~~	~~(CEQA)~~
~~(d)~~	~~456 pounds of PM_{10} per day~~	~~(PSD)~~
~~(e)~~	~~78 pounds of SO_2 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 NOx (as NO_2) per year~~	~~(Offsets, PSD)~~
~~(b)~~	~~584.2 tons of CO per year~~	~~(Cumulative Increase, PSD)~~
~~(c)~~	~~27.8 tons of POC (as CH_4) per year~~	~~(Offsets)~~
~~(d)~~	~~86.4 tons of PM_{10} per year~~	~~(Cumulative Increase, PSD)~~
~~(e)~~	~~12.2 tons of SO_2 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 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 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 (CO_2) or Oxygen (O_2) concentrations, Nitrogen Oxides (NOx) 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 NOx concentrations, NOx mass emissions (as NO_2), 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 NOx mass emissions (as NO_2), CO mass emissions, and corrected NOx and CO emission concentrations for every clock hour and for every rolling 3-hour period.~~

~~(j) On an hourly basis, the cumulative total NOx mass emissions (as NO_2) 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 NOx emission concentrations, NOx mass emissions (as NO_2), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined.~~

~~(l) On a daily basis, the cumulative total Nox 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 (PM_{10}) mass emissions (including condensable particulate matter), Sulfur Dioxide (SO_2) 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, PM_{10}, SO_2, 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, PM_{10}, SO_2, 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 (NH_3) 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 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, 70%, 85%, and 100% load) to establish the range of ammonia injection rates necessary to achieve NOx 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 (PM_{10}) 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) SO_2, SO_3, 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 PM_{10} 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 summarizing 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 PM_{10} 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 PM_{10} Mitigation Plan in cooperation with the Bay Area Air Quality Management District as outlined in the Amended PM_{10} 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 PM_{10} 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 PM_{10} 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. Darvin (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. Darvin. 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(6hr) + 260(3hr) + 312(0.5hr) = 1,248 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

NOx = 2 turbines [1 cold(480) + 1 hot(240) + 2 SD(80) + 14 hr(16.17)]
= 2,213 lbs/day

VOC = 2 [1(96) + 1(48) + 2(16) +14(2.82)] = 431 lbs/day

CO = 2 [1(5,028) + 1(2,514) + 2(902) +14(19.69)] = 19,603 lbs/day

PM10 = 24hrs[2(9 lbs/hr) + 2.83[a] lbs/hr) = 500 lbs/day

SOx = 24hrs[(4.38EE6 scf (1gr[b]./100scf)/7000gr/lbs) (64/32)] = 300 lbs/day

Notes:

a. Cooling tower PM10 emissions.
b. Staff estimates the facility's potential daily SOx 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

NOx = 2 turbines [52cold(480) + 260hot(240) +312SD(80) + 7116hrs(16.17)]
= 454,771 lbs/yr or 227.4 TPY

VOC = 2[52(96) + 260(48) + 312(16) + 7116(2.82)] = 85,062 lbs or 42.5 TPY

CO = 2[52(5,208) + 260(2,514) + 312(902) + 7116(19.69)] =2,691,988 lbs or 1,346 TPY

PM10/PM2.5 = 8364hrs[2(9) + 2.83] = 174,222 lbs or 87.1 TPY

SOx = 8364hrs[4.38EE6(0.25gr/100)/7000](64/32) = 26,167 lbs or 13.08 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:

NOx = 2 turbines [1 hot(240) + 1 SD(80) + 14 hr(16.17)]
= 1,093 lbs/day

VOC = 2 [1(48) + 1(16) +14(2.82)] = 207 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:

NOx = 2 turbines [1 cold(96) + 1 hot(40) + 2 SD(57) + 14 hr(16.17)]
= 950 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:

NOx = 2 turbines [1 cold(21.6) + 1 hot(28) + 2 SD(22) + 14 hr(16.17)]
= 640 lbs/day

VOC = 2 turbines [1 cold(20.5) + 1 hot(32) + 2 SD(10) + 14 hr(2.82)]
= 223 lbs/day

Most probable case

NOx = 2 turbines [1 hot(32) + 1 SD(10) + 14 hr(2.82)]
= 163 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
SO_2:PM10 Emissions Trade-Off Ratios Using Data Measured on 12-7-06

Site	Total SO_x ug/m^3 as SO_2	$(NH_4)_2SO_4$ ug/m^3	$(NH_4)_2SO_4$ $2H_2O$ 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.

BIOLOGICAL RESOURCES

Testimony of Marc Sazaki

SUMMARY OF CONCLUSIONS

There would be no unmitigated impacts to biological resources because of the project changes proposed in Amendment No. 1 for the Russell City Energy Center (RCEC). The project would conform to all applicable laws, ordinances, regulations, and standards (LORS) for biological resources. The new project location, as proposed, would have considerably less potential for impacts to biological resources than the project location approved in the original Commission Decision (Decision), requiring fewer mitigation measures to be implemented. Staff recommends eliminating six Biological Resources Conditions of Certification and significant changes to two other conditions.

INTRODUCTION

This analysis addresses project changes that would potentially impact biological resources in the project area. Only those aspects of the RCEC project that have changed because of the proposed amendment and that affect staff's testimony for Biological Resources as contained in the Decision, dated September 11, 2002 (CEC 2002) are examined. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.) The significant project changes that would affect biological resource impact potential are: 1) the new project would not encroach on wetlands; 2) a visual barrier would not be constructed, thus eliminating potential perch sites for raptors that could prey on sensitive species near the project; 3) the project would not directly impact potential sensitive species habitat, therefore no habitat compensation will be required, and 4) construction and operational noise levels would be somewhat attenuated because of increased distance from sensitive biological resources.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS) - COMPLIANCE

There are no new or changed biological resource LORS that would be applicable to the amended project as proposed. Because the new project location would not impact wetlands, a federal Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers and subsequent Section 401 certification from the San Francisco Bay Regional Water Quality Control Board would not be necessary. Due to the project location change, the earlier concern that the project could impact federal protected species and their habitat has been eliminated, so the project owner would not need to acquire a federal Biological Opinion from the U. S. Fish and Wildlife Service to comply with the federal Endangered Species Act. On June 11, 2007, U. S. Environmental Protection Agency Region 9 requested informal consultation with the U. S. Fish and Wildlife Service (USFWS) under Section 7 of the federal Endangered Species Act (EPA 2007) for the proposed RCEC project. In 2002, the Energy Commission licensed the Russell City project; however, formal consultation between EPA and USFWS was not

completed when Calpine withdrew plans to construct the project. Based upon a review of the project and the proposed new location, EPA believes that the project is not likely to adversely affect any federally protected species in the project area, and requested written concurrence, if USFWS agrees. Although a Section 401 certification related to a Section 404 permit would not be necessary, there would likely be a Section 401 certification required for the off-site stormwater discharge.

SETTING

REGIONAL

The regional setting for the new project has not changed because the new project site is approximately 1,300 feet to the north-northwest of the original project site.

LOCAL

From a local perspective, the new site is different from the original location in that the new project site includes commercial/light industrial development and a sludge drying area at the Hayward Water Pollution Control Facility (WPCF). Wildlife habitat is nonexistent to marginal at best, with only limited ruderal vegetation in a spotty distribution. Various shore birds and other avian species congregate in and around available surface waters such as abandoned salt ponds and WPCF ponds. Although the Final Staff Assessment for the original project identified significant biological resources areas to the west and southwest, the new site is further away resulting in less potential for impacts on these resources. The linear facilities will initially pass through more highly developed areas than originally planned, but for the most part, the transmission line will follow an existing corridor to the nearby Eastshore Substation.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Energy Commission staff considers the methods and/or thresholds for significance unchanged since the 2002 Decision was released.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)

The BRMIMP needs to be in place prior to the beginning of any project related surface disturbance and throughout construction to ensure that the project owner has the informational details necessary to comply with Biological Resources conditions of certification and applicable LORS. This is accomplished through the selection of a competent Designated Biologist who will coordinate with the project owner during construction. For the proposed amendment, specific items related to Biological Resources Conditions of Certification are modified or deleted to be consistent with the changes that will result from adoption of the proposed amendment.

Special-Status Species

Based on the results of 2006 field surveys conducted by the project owner (RCEC 2006), and a site visit by Energy Commission staff, new potential construction related impacts on biological resources are not expected to occur. Any construction related impacts not addressed when the original project was certified will be minimal and where they develop, can be dealt with effectively through guidance measures provided in the BRMIMP. This includes the unlikely event of encountering special-status species on the project site and ancillary facilities.

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 new project site does not represent sensitive species habitat, and therefore the project owner would not be required to get a Biological Opinion from the U. S. Fish and Wildlife Service and would not have to provide any habitat compensation. Biological Resources Conditions of Certification **BIO-6** (Biological Opinion) and **BIO-10** (Habitat Compensation) are no longer necessary.

Predator Perching

The new project does not include the original project's elaborate visual screening that would have given raptors new perching opportunities, thus increasing potential predation on sensitive species (RCEC 2006). Mitigation previously required in Biological Resources Condition of Certification **BIO-14** for this potential impact is no longer necessary.

Construction Noise

The project owner suggests that the increased distance from the most biologically sensitive area to the south and west (the wetlands) of the original project site, in conjunction with warehouses between the new project site and the sensitive species habitat, would reduce the potential for construction noise impacts to sensitive species. These loud construction noises would emanate from pile driving and steam blow activities during construction. Energy Commission staff agrees that the increased distance between the sensitive species habitat near the original project location and the new project site would diminish the noise levels there, but the arrangement of the warehouses that could act as a buffer are actually not well suited to accomplish this buffering effect. The existing buildings are long, narrow, and oriented in a north-south direction with a sizable gap between them (see **PROJECT DESCRIPTION Figure 2**). This gap will not block all construction noise to these sensitive areas. Furthermore, the analysis supporting the original decision, described a one mile zone of influence where

sensitive nesting species could be affected by construction noises described above. The construction noise mitigation plan requirement (**BIO-12**) adopted in the original Decision (CEC 2002) should be retained. This plan must be incorporated into the BRMIMP and implemented to provide the required lessening of the noise impacts to nearby sensitive species.

Operation Impacts and Mitigation

Biological Resources Mitigation Implementation and Monitoring Plan

This plan needs to be created by the project owner and in place during project operation to ensure that the project owner has the informational details necessary to comply with Biological Resources conditions of certification and applicable LORS. This is accomplished through the services of a competent Designated Biologist, approved by the Energy Commission Compliance Project Manager (CPM), who would coordinate with the project Construction/Operation Manager (see Biological Resources Condition of Certification **BIO-3**) during project operation. For the proposed amendment, specific items related to Biological Resources conditions of certification are modified or deleted to be consistent with the changes that would result from adoption of the proposed amendment.

Operational Noise

The operational noise issue is addressed in the Decision for the original project and would generally remain unchanged for the new project location, except that no operational noise mitigation plan is necessary for inclusion in **BIO-12** because the anticipated noise levels at the new plant boundary adjacent to sensitive wildlife habitat are not relatively excessive (RCEC 2006).

Bird Electrocution or Collisions with Transmission Lines

The operation issue related to bird electrocutions and collisions with transmission lines is addressed in the Decision for the original project and remain unchanged for the new project location.

Stormwater Runoff

This operational issue was addressed in the Decision on the original project and primarily dealt with potential negative effects on nearby sensitive species habitats and wetlands. A Drainage, Erosion, and Sedimentation Control Plan (DESCP) developed for compliance with Soil and Water Resources Condition of Certification **SOIL & WATER-1** should be identified in the BRMIMP (**BIO-4)** in case unforeseen circumstances potentially affecting sensitive biological resources, related to storm water run-off, arise in the future. Also, the Storm Water Pollution Protection Plan (SWPP) required under the National Pollution Discharge Elimination System (NPDES) permit should be identified in the BRMIMP.

San Francisco Bay Water Quality

Because the project owner now proposes to use a zero liquid discharge process, there would be no impacts from process effluent discharges. Biological Resources Condition of Certification **BIO-8** in the Decision required the project owner obtain a Section 401 Clean Water Act certification from the San Francisco Bay Regional Water Quality

Control Board. Because of this project change, this certification would not be necessary.

Cumulative Impacts and Mitigation

Cumulative loss of wetland habitat, identified in the original Decision, would now not occur because of the proposed project changes. This issue pertaining to biological resources is no longer a concern, and Energy Commission staff has no changes to the cumulative impacts discussion that was contained in the 2002 Decision.

RESPONSE TO AGENCY COMMENTS

Staff consulted the California Department of Fish and Game regarding whether the new project should retain the bird flight diverter requirement specified in the original Decision. J. Krause (2007) recommended that the new project continue to be required to install bird flight diverters on the new transmission line overhead ground wire since the project is still in the region of the bay shoreline. Large flocks of shore birds are still found in the area, and the transmission line overhead ground wire may pose a collision threat to the local birds. The Energy Commission staff agrees with this recommendation and retains Biological Resources Condition of Certification **BIO-13** requiring verification be provided to demonstrate the bird flight diverters are installed on the new transmission line overhead ground wire prior to energizing the transmission line.

CONCLUSIONS

The project changes as proposed in the Petition to Amend would conform to applicable LORS and would not have a significant affect on sensitive species or their habitat near the project and ancillary facilities, if the proposed Biological Resources conditions of certification below are adopted. Due to the project changes, staff have eliminated six conditions of certification originally contained in the Decision and have made changes to two additional conditions.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The following Biological Resources conditions of certification are the original conditions of certification contained in the Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of the Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout is used to indicate deleted language and underline for new language.

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall submit the resume, including contact information, of the proposed Designated Biologist to the CPM for approval.

Verification: The project owner shall submit the specified information at least 60 days prior to the start of any site (or related facilities) mobilization. Site and related

facility activities shall not commence until an approved Designated Biologist is available to be on site.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Three years of experience in field biology or current certification of a of a nationally recognized biological society, such as The Ecological society of America or The Wildlife Society; and
3. At least one year of field experience with biological resources found in or the project area.

If a Designated Biologist needs to be replaced, then the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The Designated Biologist shall perform the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities:

1. Advise the project owner's Construction/Operation Manager, supervising construction and operations engineer on the implementation of the biological resources conditions of certification;
2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
4. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (parking lots) for animals in harms way;
5. Notify the project owner and the CPM of any non-compliance with any biological resources condition of certification; and
6. Respond directly to inquiries of the CPM regarding biological resource issues.

Verification: The Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted in the Monthly Compliance Reports.

During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

DESIGNATED BIOLOGIST AUTHORITY

BIO-3 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist to ensure conformance with the biological resources conditions of certification.

If required by the Designated Biologist, the project owner's Construction/ Operation Manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the halt.

Verification: The Designated Biologist must notify the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN

BIO-4 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and, once approved, shall implement the measures identified in the plan.

The BRMIMP shall identify:

1. All Biological Resource conditions included in the Energy Commission's Final Decision;
2. ~~A copy of the final, approved Perch Deterrent and Management Plan. The final, approved plan will include detailed information regarding how nesting, perching/roosting of raptors and corvids (crows and ravens) will be discouraged. Also to be included are the final plans for monitoring the success of perch deterrents and the final adaptive management plan;~~

3. A listing, including approval dates, of plans addressing storm water treatment at the project site including the Drainage, Erosion, and Sedimentation control Plan (DESCP) and the Storm Water Pollution Protection Plan (SWPP);
4. A list of all measures which will be implemented to mitigate the construction ~~and operational noise~~ impacts caused by the proposed RCEC;
5. A list and a map of locations of all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;
6. A list of all terms and conditions set forth by ~~the~~ USACE Section 404 permits and state SFRWQCB 401 certifications, should these become necessary throughout the life of the project;
7. Detailed descriptions of all measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;
8. All locations, on a map of suitable scale, of areas requiring temporary protection and avoidance during construction;
9. Aerial photographs (scale 1:200) of all areas to be disturbed during construction activities-one set prior to site disturbance and one set after project construction. Include planned timing of aerial photography and a description of why times were chosen;
10. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
11. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
12. All performance standards and remedial measures to be implemented if performance standards are not met;
13. A discussion of biological resource-related facility closure measures;
14. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval;
15. A copy of ~~the~~ any State or USFWS Biological Opinion, and incorporation of all terms and conditions into the final BRMIMP, should a biological opinion become necessary any time throughout the life of the project;
16. A discussion of bird flight diverters and how they will be installed, replaced and maintained during the life of the project; and
17. ~~Written verification that the required habitat compensation has been purchased and a suitable endowment has been provided to manage the habitat compensation acreage in perpetuity;~~
18. A copy of the final construction noise mitigation plan~~;~~.
19. ~~A copy of the final Wetland Mitigation Plan including results of the hydrological modeling analysis and final plans for dredging and levee removal and reduction; and~~

~~20. A letter from EBRPD verifying that the endowment provided by the project owner is sufficiently large to fund, for the life of the project, a predator management program.~~

Verification: At least 30 days prior to start of any site mobilization activities, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-5 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during construction and operation, are informed about sensitive biological resources associated with the project.

The Worker Environmental Awareness Program must:

1. Be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and permanent habitat protection measures; and
5. Identify whom to contact if there are further comments and questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: No less than 30 days prior to the start of any site mobilization activities, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number

of persons who have completed the training in the prior month and keep record of all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

~~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 CPM with a copy of the USFWS Biological Opinion. All terms and conditions of the Biological 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 for stormwater discharges.~~

~~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.~~

~~HABITAT COMPENSATION~~

~~BIO-10~~ ~~The project owner shall provide 26.19 acres of habitat to compensate for the loss of upland, freshwater seasonal wetlands and salt marsh habitats. 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 EBRPD;~~
3. ~~Assist in arranging a long-term lease for 30 acres of salt marsh habitat owned by the City of Hayward;~~
4. ~~Provide a suitable endowment fund 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.~~

FACILITY CLOSURE

BIO-11 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the project Biological Resources Mitigation Implementation and Monitoring Plan.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

CONSTRUCTION NOISE LEVELS

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 Energy Commission CPM in consultation with the USFWS, CDFG, and 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~~.

BIRD FLIGHT DIVERTERS

BIO-13 Bird flight diverters will be placed on all overhead ground wires associated with the RCEC power plant.

During construction of the RCEC transmission line, bird flight diverters will be installed to manufacturer's specification. ~~CEC~~ Energy Commission staff, in consultation with the USFWS and CDFG, will provide final approval of the bird flight diverter to be installed. Staff recommends that the Swan Flight Diverter be given careful consideration when making a decision about which diverter is to be installed.

Verification: No less than 7 days prior to energizing the new RCEC transmission line, the project owner will provide photographic verification to the Energy Commission CPM that bird flight diverters have been installed to manufacturer's specifications. A discussion of how the bird flight diverters will be maintained during the life of the project will be included in the project's BRMIMP.

~~**PERCH DETERRENT MANAGEMENT PLAN**~~

~~**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 corvids;~~

~~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.~~

~~**WETLAND MITIGATION PLAN**~~

~~**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.~~

REFERENCES

CEC (California Energy Commission). 2002. Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002.

EPA (U. S. Environmental Protection Agency). 2007. Letter requesting informal consultation, under Section 7 of the federal Endangered Species Act, from Gerardo Rios (Chief Permits Office) to Brian Olah (Chief of Endangered Species Division) U. S. Fish and Wildlife Service. June 11, 2007.

Krause, J. 2006. California Department of Fish and Game. E-mail Correspondence with Marc Sazaki. Eden Landing Ecological Preserve. January 23, 2007.

RCEC (Russell City Energy Company, LLC). 2006. Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.

RCEC (Russell City Energy Company, LLC). 2007. Russell City Energy Company, LLC, Response to Data Requests 1-52, submitted to the California Energy Commission on January 17, 2007. Data Response 17-20

CULTURAL RESOURCES

Testimony of Dorothy Torres

SUMMARY OF CONCLUSIONS

Staff has determined that there would be no impact to known archaeological or ethnographic resources. The project owner's architectural historian has recommended that the three buildings located on the project site are not eligible for the California Register of Historical Resources (CRHR) and staff has agreed with that recommendation. Since the buildings are not eligible for the CRHR (significant), no mitigation is necessary.

There is a potential for discovering archaeological sites during ground disturbance for Amendment No. 1. Implementation of Conditions of Certification **CUL-1** through **CUL-7** would mitigate any impacts to newly discovered archaeological sites to below a level of significance. Staff's proposed conditions of certification would ensure that the proposed project's incremental effect is not cumulatively significant.

INTRODUCTION

This analysis covers only those aspects of the original Russell City Energy Center (RCEC) project that have changed as a result of the proposed amendment and that affect staff's testimony for Cultural Resources as contained in the Decision dated September 11, 2002. Staff has considered the change of the project site location that includes the addition of four parcels that would be permanently altered by the project and one parcel that would be temporarily altered. The natural gas pipeline route would be relocated. Transmission line routes Alternative 1 and Alternative 2 would be added to the previously permitted transmission line route.

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

There are no new or changed LORS applicable to Amendment No. 1.

SETTING

Amendment No. 1 would move the project location to four new parcels of land that would remain permanently in use. An additional parcel would be used as a temporary parking/laydown area. Portions of those parcels have not previously been surveyed for cultural resources. The project region remains the same as the original RCEC project. The new project site for Amendment No. 1, would be adjacent to, and south of, Depot Road approximately 300 feet from the northern boundary of the previously permitted project. The new natural gas pipeline route would run entirely under Depot Road. Amendment No. 1 adds Transmission Alternative 1, that extends from the proposed new switchyard east to the eastern edge of the property and then north towards Depot Road. At Depot Road, Alternative 1 would turn east and run approximately 230 feet to the existing Grant-Eastshore 115-kV corridor (RC 2006a, p. 2-13). The remaining

portion of the line would run parallel to the existing 115-kV line continuing to the Eastshore Substation. The portion of the transmission line route from Enterprise Avenue to Eastshore Substation was previously permitted under the Decision for the original RCEC.

Transmission line Alternative 2 would extend from the Amendment No. 1 switchyard to the eastern edge of the property. It would then extend south to the southern edge of the property and turn east to run approximately 950 feet along the northern boundary of the City of Hayward Water Pollution Control Facility property to connect with the Grant-Eastshore 115-kV transmission corridor. The transmission corridor then extends to the Eastshore Substation (RC 2006a, p. 2-13). At the project site, the geotechnical investigation revealed there is up to seven feet of fill over the fairly level project terrain (CH2MHILL 2007c, p. 5).

RESOURCES INVENTORY

Literature/Records Search and Native American Contacts

The literature/records search conducted for the original RCEC Application for Certification (AFC) (2001) did not identify any previously recorded cultural resources, either archaeological or historic buildings or structures (CEC 2002b), and an additional records search was not conducted for the amendment. Native American groups and individuals were also contacted regarding ethnographic concerns in the vicinity of the original project. On January 16, 2007, the project owner sent letters describing the Amendment No. 1 project changes to eight Native American groups or individuals who may have concerns with construction related impacts in the project vicinity. The project owner followed up the mailings with additional e-mails and phone calls. One person responded that she needed additional cultural resources information before she could comment. Another person referred the project's representative to another Native American who had already been contacted and the third person responded that she was not aware of anything in the area (CH2MHILL 2007d).

Field Surveys

The proposed project would be relocated for the Amendment No. 1. Areas previously surveyed for the original RCEC were not resurveyed for Amendment No. 1 (RC 2006a, p. 3-77).

The power block for Amendment No. 1 would be located on the portion of the City of Hayward parcel that is currently used for sewage sludge drying. This portion of the project site was previously surveyed for cultural resources for the original RCEC project (RC 2006a, p. 3-77).

The western portion of the project site would be located on the 8.23-acre Eash parcel. This portion was surveyed for archaeological resources by Dr. Doug Davy on October 5, 2006. Several businesses exist on this parcel. Ground visibility within the existing pallet storage yard was about 70 percent, however, about 50 percent of the ground was visible in the areas of the metals fabrication business, lumberyard, pallet storage and distribution area, and miscellaneous storage area (RC 2006a, p. 3-77).

A portion of the natural gas pipeline that runs along Depot Road was surveyed as part of the original RCEC AFC (2001). The natural gas pipeline route proposed for Amendment No. 1 would run from PG&E line 153 at the Union Pacific Railroad tracks to the proposed project site. Ground that was not covered with pavement, landscaping, or concrete was examined for cultural resources. The portion of the route surveyed for Amendment No. 1 extends from Viking Street to the new project site (RC 2006a, p. 3-78).

The western side of the transmission line corridor, from the interconnection of the transmission line corridor of Alternative 2 with the 115-kV line corridor to Enterprise Avenue, was surveyed for cultural resources for the original RCEC project (CH2MHILL 2007a). Dr. Davy surveyed the eastern portion of the transmission line corridor on April 2, 2007. Construction workers working on another project on the site he was surveying told him that they had encountered fill at a depth of approximately one to four feet (CH2MHILL 2007d, p. 18). Two additional alternative transmission line routes are proposed for Amendment No. 1. A portion of the transmission line Alternative 1 along Depot Road was surveyed for cultural resources on October 5, 2006 (RC 2006a, p. 3-78). On April 2, 2007, Dr. Davy surveyed a portion of Alternative 1 in the area adjacent to an existing transmission tower because that location is the most likely location to place a tower for the RCEC transmission line (CH2MHILL 2007d, p. 18).

The Aladdin Parcel was not surveyed for cultural resources because it currently includes an automobile salvage and equipment storage yard. The northern part of the parcel is covered with automobiles, automobile parts, and gravel. The southern part is covered with buildings, sheds, and storage containers. Spaces between the salvaged automobiles, buildings, sheds and storage containers have a dense cover and gravel (CH2MHILL 2007d, p. 18). This location will be surveyed when material is cleared and ground surface is visible.

The Alternative 2 transmission line route would extend east from the RCEC parcel immediately north of the wastewater treatment plant to the Grant-Eastshore transmission corridor. The route would cross six parcels that are paved, graveled, filled and used for automobile salvage or equipment storage. Surveys on this route are not reasonable until ground surface can be observed (CH2MHILL 2007d, p. 18).

The laydown and parking areas were surveyed for cultural resources. No cultural resources were identified (RC 2006a, p. 3-78; CH2MHILL 2007a; CH2MHILL 2007d, Figure DR58-1).

An architectural reconnaissance was conducted for the new proposed project. The project owner identified buildings and structures on the Eash parcel and in the project vicinity that appear to be more than 45 years old. Aerial photographs were also examined to identify buildings or structures that might be more than 45 years old. Three buildings, still present on the Eash parcel, appear to have been part of a cluster of buildings identified on an aerial photo from 1939. The three buildings appear to be part of an agricultural operation or farmstead, but no farmhouse can be identified in the photograph. All three buildings were also identified on maps dated from 1946 to 1965 (RC 2006a, p. 3-81).

On January 23, 2007, staff drove the proposed gas line route along Depot Road to determine whether there were any buildings or structures along the route that could be older than 45 years of age and that might be affected by vibration associated with construction activities. Staff did not identify any buildings or structures that appeared to be old enough and that might be affected.

Identified Prehistoric and Historic Archaeological Resources

No archaeological resources were identified from the records search or during archaeological surveys conducted for Amendment No. 1. However, the project region is the same as the area reviewed for the original project, and the Decision determined that the project area has been subject to high rates of deposition that would bury archaeological resources. The Decision also stressed that the project's location near the shoreline is highly sensitive for prehistoric archaeological resources (CEC 2002b). Since the new project site is also near the original shoreline, the new project site would be considered sensitive for prehistoric archaeological resources.

Identified Historic Standing Structures

The project owner identified three buildings more than 45 years old located on the project site. The buildings are located on a parcel formerly owned by Mary Clawiter as indicated by 1897 and 1898 Assessor Maps. At the turn of the century, the east side of the property was deeded to E.H. Clawiter, Mary Clawiter's son. Prior to incorporation by the County of Alameda, the project area was part of Eden Township. In 1902, records show that there was no improvement on the property indicating the buildings had not yet been constructed (CH2MHILL 2007d, DPR form).

It is likely the buildings were constructed between 1902 and 1938 and it is not clear whether they may have been used for agriculture or salt production. Buildings have been removed and added at this location for over 60 years. At one time a fertilizer plant was located on the property and at various times in the past, it has been the location of a lumber storage yard, a metal fabrication business, and a pallet recycling facility. In 1938, the American Salt Company was located at the end of Depot Road near the project site. The Salt Company was owned by the Marsicano family who owned most of the land between the Clawiter parcel and the bay. The buildings may have been associated with salt production.

The first building is described by the project owner's architectural historian, Jessica Feldman, as a barn or barn-like structure and appears as part of a cluster of buildings on a 1939 aerial photograph (CH2MHILL 2007a). It is composed of two buildings joined together, the larger building is two stories, and the smaller is one story. Measured together the buildings are 115 feet long and both are 30 feet in width. Both buildings have board-and-batten siding and corrugated metal roofing. A hopper apparatus faces the south wall of the larger building and appears to be a device for handling agricultural products. The east side of the building has an awning that extends approximately 15 feet outward. The foundation of the building is elevated approximately six inches higher than the surrounding ground level (RC 2006a, p. 3-81). The architectural style of the barn could be considered to be vernacular, and according to the owner's architectural historian, the style, method of construction and material used to construct the barn are

all common in the United States. There are several smaller barns along nearby Winton Road with similar construction (CH2MHILL 2007d, DPR form).

It is not possible to determine the barn's date of construction, and therefore not possible to develop a period of significance. Since 1938, the character of the area has changed. Farms in the area have moved, and construction of the equalization ponds for the City of Hayward Water Pollution Control Facility was completed by the late 1950s. By the early 1970s, both north and south Depot Road had been converted to commercial and industrial uses. These factors have contributed to the barn property's loss of integrity of setting, feeling, and association. The barn does not appear to be associated with an important person and does not appear to be the work of a master. In addition, it does not appear to be associated with any one person and there is no person of significance associated with the structures. There is no evidence that any events important in history have occurred there.

A shed is located to the east of the barn-like structure. The shed also has corrugated metal roofing, board-and-batten siding and a simple gable roof. It has a small lean-to shed on the south side, two entry doors, and one window. It is 30 feet X 30 feet and the lean-to is 20 feet X 10 feet (RC 2006a, p. 3-81).

A garage or shop building is also on the Eash parcel and appears on the1939 aerial photos. It is situated at the end of a long access road and east of the barn-like structure. It has a gable roof and board-and-batten siding, with corrugated metal added in some places. The roof is also corrugated metal, and there is a small lean-to shed at the building's south side. A sliding door opens the entire front of the building. The garage or shop measures 45 feet X 30 feet, and the lean-to measures 15 feet X 10 feet. There is a large window on the northwest side of the garage or shop (RC 2006a, p. 3-81).

On later aerial photos and maps, these three buildings can be observed until 1965, while other buildings no longer remain. Information provided by the project owner and information gathered during staff's site visit on January 23, 2007, did not yield sufficient information to enable staff to determine whether the buildings are eligible to the CRHR (CH2MHILL 2007a). However, at a later date, the eligibility of the three buildings was assessed by an architectural historian, consultant to the owner. Like the barn, the garage and shed do not appear to be associated with a person of significance and they do not appear to be the work of a master. There is also no evidence and any events important in history have occurred there. The three buildings do not appear to retain integrity of setting, feeling and association (CH2MHILL 2007d, DPR form). The owner's consultant recommended that the three buildings are not eligible for the CRHR and staff agrees with that recommendation.

Ethnographic Concerns

Eight Native American groups or individuals were contacted by the project owner. No ethnographic concerns were identified in the vicinity of the project (CH2MHILL 2007d).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff's method for determining significance has not changed since the original RCEC Decision.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

No archaeological resources were identified during surveys for the original RCEC project. Surveys of all the locations where the ground is visible have been conducted. Additional surveys of the Aladdin Parcel, Alternate Transmission Route 2, and locations of ground disturbance along Alternate Route 1, will be conducted after automobile salvage areas, storage containers, and gravel are removed and the ground is visible (CH2MHILL 2007d, p. 18). Additional ground investigation will be governed by Condition of Certification **CUL-7**. There will be no impacts to known archaeological resources.

Three buildings more than 45 years old would be demolished by the project. Jessica Feldman, architectural historian and consultant to the owner, has provided evidence that supports her recommendation that the buildings are not eligible for the CRHR. She asserts that these buildings do not meet the criteria for eligibility to the CRHR because they are standard agricultural buildings dating to the early twentieth century and the integrity of association of the three buildings has been damaged because they are the only survivors of what previously was a group of buildings (RC 2006a, p. 3-78). Staff agrees that the buildings are not eligible for the CRHR and that impacts from the project do not require mitigation.

There are no identified ethnographic sites that would be impacted by the RCEC.

CUMULATIVE IMPACTS AND MITIGATION

A cumulative impact refers to a proposed project's incremental effect together with that of 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.). The Eastshore Energy Center is proposed for a location within one mile of the Amendment No. 1 project site and reconductoring of the existing transmission line from the Eastshore Substation to the Dunbarton Substation is proposed to facilitate movement of additional electricity supply. Proponents for the Eastshore Energy Center, the Eastshore to Dunbarton reconductoring, and other future projects in the Amendment No. 1 area can mitigate impacts to as yet undiscovered subsurface archaeological deposits to less than significant by implementing mitigation measures requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for resources evaluated as significant (eligible for the CRHR or National Register of Historical Places). Staff's proposed conditions of certification will ensure that the proposed project's incremental effect is not cumulatively considerable.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments were received from agencies or the public regarding cultural resources.

CONCLUSIONS

Staff has determined that Amendment No. 1 would have an impact on the three structures (barn, garage and shed) located on the proposed project site. The structures are more than 45 years old, but are not historically significant; therefore, no mitigation is necessary. The Aladdin Parcel, portions of the transmission line route and Alternative 2 would be surveyed for archaeological resources when debris and ground cover have been removed. Likewise, portions of transmission line route Alternative 1 that are subject to ground disturbance would be surveyed when debris have been removed and ground surface is visible. Activities undertaken in locations where ground surface was not visible would be governed by Condition of Certification **CUL-7**.

No known significant historic standing structures or known ethnographic resources would be impacted by the project. With the adoption and implementation of Conditions of Certification **CUL-1** through **CUL-7,** ground disturbance and construction would result in a less than significant impact on newly found archaeological resources or those known resources that might be impacted in a previously unanticipated manner. The project would therefore be in compliance with applicable state laws, ordinances, regulations, and standards.

Staff recommends the adoption of the following Cultural Resources conditions of certification, which include and expand upon the project owner's proposed mitigation measures. When properly implemented, these conditions of certification would mitigate to less than significant any impacts to unknown cultural resources if they are discovered during ground disturbance and any impacts to known cultural resources that might be impacted in an unanticipated manner for the proposed project.

PROPOSED AMENDED CONDITIONS OF CERTIFICATION

The following Cultural Resources conditions of certification are the original conditions of certification contained in the RCEC Energy Commission Decision (2002), however there are also proposed modifications or deletions that staff has identified as a result of project changes proposed by the project owner. The original Condition of Certification **CUL-7** allows for surveys of laydown areas to be conducted after permitting, but this condition was project-specific to the original RCEC site and laydown locations and the original **CUL-7** has been deleted.

A new Condition **CUL-7** provides guidance and oversight during debris removal in locations where cultural resources surveys could not be conducted because very little ground was visible. The Amendment No. 1 project location is an area that the Decision for the RCEC identified as sensitive for cultural resources. Other conditions have been modified to reflect current conditions of certification placed on projects and to allow the project owner and staff more flexibility to mitigate impacts to known and newly

discovered cultural resources. Strikeout is used to indicate deleted language and new language is underlined.

CUL-1 Prior to the start of pre-construction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and resume of its Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, who will be responsible for implementation of all cultural resources conditions of certification. Approval of a CRS may be denied or revoked for non-compliance on this or previous Energy Commission projects.

Protocol:

a. The resume for the CRS and alternate, if an alternate is proposed, shall include information that demonstrates that the CRS meets the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published in the Code of Federal Regulations, 36 CFR Part 61. The technical specialty of the CRS shall be appropriate to the needs of this project and shall include a background in anthropology, archaeology, history, architectural history or a related field. The background of the CRS shall include at least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California; The resume shall include the names and phone numbers of contacts familiar with the CRS's work on referenced projects.

b. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during project ground disturbance, construction and operation.

c. The CRS may obtain qualified cultural resource monitors to monitor as necessary on the project. Cultural resource monitors shall meet the following qualifications:

- A BS or BA degree in anthropology, archaeology, historic archaeology or a related field and one year experience monitoring in California; or
- An AS or AA in anthropology, archaeology, historic archaeology or a related field and four years experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historic archaeology or a related field and two years of monitoring experience in California.

d. The project owner shall ensure that the CRS completes any monitoring, mitigation and curation activities necessary to this project and fulfills all the requirements of these conditions of certification. The project owner shall also ensure that the CRS obtains additional technical specialists, or additional monitors, if needed, for this project. The project owner shall also ensure that the CRS evaluates any cultural resources that are newly discovered or that may be affected in an unanticipated manner for eligibility to the California

Register of Historic Resources (CRHR). No ground disturbance shall occur prior to CPM approval of the CRS, unless specifically approved by the CPM.

Verification: At least 45 days prior to the start of pre-construction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall submit the name and statement of qualifications of its CRS and alternate CRS, if an alternate is proposed, to the CPM for review and approval.

(1) If the CPM determines the proposed CRS to be unacceptable, the project owner shall submit another individual's name and resume for consideration. If the CPM determines the proposed alternate to be unacceptable, the project owner may submit another individual's name and resume for consideration.

(2) At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for cultural resource monitoring required by this condition. If additional monitors are obtained during the project, the CRS shall provide additional letters to the CPM, identifying the monitor and attesting to the monitor's qualifications. The letter shall be provided one week prior to the monitor beginning on-site duties.

(3) At least 10 days, prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions of certification.

(4) At least 10 days prior to ~~the~~ a termination or release of the CRS, or within 3 days after resignation of the CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. If there is no alternate CRS in place to conduct the duties of the CRS, a previously approved monitor may serve in place of a CRS so that construction may continue up to a maximum of 3 days without a CRS. If cultural resources are discovered, then construction will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

CUL-2 Prior to the start of pre-construction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps will include the appropriate USGS quadrangle(s) and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide them, with copies to the CPM. If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes to the CRS and the CPM. Maps shall identify all areas of the project where ground disturbance is anticipated. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless specifically approved by the CPM.

(1) If construction of this project will proceed in phases, maps and drawings may be submitted in phases. A letter identifying the proposed schedule of each project phase shall be provided to the CPM.

(2) Prior to implementation of additional phases of the project, current maps and drawings shall be submitted to the CPM.

(3) At a minimum, the CRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed. A current schedule of anticipated project activity shall be provided to the CRS on a weekly basis during ground disturbance and provided to the CPM in each Monthly Compliance Report (MCR).

Verification: At least 40 days prior to the start of pre-construction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall provide the designated cultural resources specialist and the CPM with the maps and drawings.

(1) If this is to be a phased project, a letter identifying the proposed schedule of the ground disturbance or construction phases of the project shall also be submitted.

(2) At least 30 days prior to the start of ground disturbance on each phase of the project, following initial ground disturbance, copies of maps and drawings reflecting additional phases of the project, shall be provided to the CPM for review and approval.

(3) If there are changes to the scheduling of the construction phases of the project, a letter shall be submitted to the CPM within 5 days of identifying the changes. A copy of the current schedule of anticipated project activity shall be submitted in each MCR.

CUL-3 Prior to the start of pre-construction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and approval, a Cultural Resources Monitoring and Mitigation Plan (CRMMP), identifying general and specific measures to minimize potential impacts to sensitive cultural resources. Approval of the CRMMP, by the CPM, shall occur prior to any ground disturbance. No pre-construction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, shall occur prior to CPM approval of the CRMMP, unless specifically approved by the CPM.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

a. A proposed general research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the post-construction analysis of recovered data and materials. A prescriptive treatment plan may be included in the CRMMP for limited resource types. A refined research design will be prepared for any resource where data recovery is required.

b. The following statement must be included in the Introduction: “Any discussion, summary, or paraphrasing of the conditions in the CRMMP is intended as general guidance and as an aid to the user in understanding the

conditions and their implementation. The conditions, as written in the Decision, shall supersede any summarization, description, or interpretation or the conditions in the CRMMP. The Cultural Resources conditions of certification from the Decision are contained in Appendix A."

~~b~~c. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.

~~c~~d. Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.

~~d~~e. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.

~~e~~f. A discussion of all avoidance measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

~~f~~g. A discussion of the location(s) where monitoring of project construction activities is deemed necessary. Monitoring shall be conducted full time, during ground disturbance on the project site, linear alignments, and staging areas.

~~g~~h. A discussion of the requirement that all cultural resources encountered will be recorded on a DPR form 523 and mapped (may include photos). In addition, a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design and that all archaeological materials collected as a result of the archaeological investigations shall be curated in accordance with The State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum. ~~The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth in Title 36 of the Federal Code of Regulations, Part 79.~~ Discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how requirements, specifications and funding will be met. In addition, the name and phone number of the contact person at the institution shall be included. In addition, include information indicating that the project owner will pay all curation fees and that any agreements concerning curation will be retained and available for audit for the life of the project.

~~h~~i. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.

~~i~~j. A discussion of the proposed Cultural Resource Report that shall be prepared according to Archaeological Resource Management Report (ARMR) Guidelines. The CRR shall include all cultural resource information (survey, testing, monitoring, data recovery, and analysis) obtained as a result of this project. All survey reports and additional research reports, not previously submitted to the CHRIS, shall be included as an appendix to the CRR. Maps delineating the location of all archaeological work shall be included in the CRR. Tables, charts or graphs shall be included as necessary. Descriptions of soils shall be included wherever subsurface excavations are undertaken for archaeological testing or data recovery or where monitoring of excavations occurs. This report shall be submitted to the CPM after the conclusion of ground disturbance (including landscaping). This report shall be considered final upon approval by the CPM.

Verification: At least 30 days prior to the start of pre-construction site mobilization; construction ground disturbance; construction grading, boring, and trenching; and construction, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resource specialist, to the CPM for review and written approval. At least 30 days prior to ground disturbance the project owner shall submit a letter to the CPM indicating that they will pay any curation fees for curation of any collected archaeological artifacts. The CRR shall be submitted to the CPM within 90 days after completion of ground disturbance (including landscaping) for review and approval. Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the curating institution (if archaeological materials were collected), the SHPO and the CHRIS.

CUL-4 The project owner shall ensure that a Worker Environmental Awareness Training for all new employees shall be conducted ~~on a weekly basis,~~ prior to beginning and during periods of pre-construction site mobilization, construction ground disturbance, construction grading, boring, and trenching, and construction. The training may be presented in the form of a video. The training shall include a discussion of applicable laws and penalties under the law. Training shall also include samples or visuals of artifacts that might be found in the project vicinity and the information that the CRS, alternate CRS or monitor has the authority to halt construction in the event of a discovery or unanticipated impact to a cultural resource. The training shall also instruct employees to halt or redirect work in the vicinity of a find and to contact their supervisor and the CRS or monitor. An informational brochure shall be provided that identifies reporting procedures in the event of a discovery. Workers shall sign an acknowledgement form that they have received training and a sticker shall be placed on hard hats provided indicating that environmental training has been completed.

Verification: At a minimum, training for new employees shall be conducted on a weekly basis. Copies of acknowledgement forms signed by trainees shall be provided in the MCR.

CUL-5 The project owner shall ensure that the CRS, alternate CRS and the Cultural Resources Monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered or if

known resources may be impacted in a previously unanticipated manner. If such resources are found, the halting or redirection of construction shall remain in effect until all of the following have occurred:

(1) The CRS has notified the CPM and the project owner of the find and the work stoppage;

(2) The CRS, the project owner, and the CPM have conferred and ~~determined what, if any, data recovery or other mitigation is needed;~~ the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation and any necessary data recovery and mitigation have been completed; and

(3) ~~Any necessary data recovery and mitigation has been completed.~~ If data recovery or other mitigation measures are required, the CRS and/or the alternate CRS and cultural resource monitor(s), including Native American monitor(s), shall monitor these data recovery and mitigation measures, as needed. For any cultural resource encountered, the project owner shall notify the CPM within 24 hours after the find.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS, alternate CRS and cultural resources monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find and stating that the CRS will notify the CPM and project owner within 24 hours after a find.

CUL-6 The project owner shall ensure that the CRS, alternate CRS, or monitors shall monitor ground disturbance full-time in the vicinity of the project site, linears and ground disturbance at laydown areas to ensure there are no impacts to undiscovered resources. In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter or e-mail providing a detailed justification for that decision to reduce the level of monitoring shall be provided to the CPM for review and approval prior to any reduction in monitoring.

(1) Monitors shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical taff.

(2) The CRS shall notify the project owner and the CPM, by telephone or email, of a~~ny~~ll incidents of non-compliance with any cultural resources conditions of certification within 24 hours of becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification.

(3) Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions of certification.

(4) A Native American monitor shall be obtained, at a minimum on an on call basis, to monitor ground disturbance in areas where Native American artifacts may be discovered as identified by the CRS. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that will be monitored.

Verification: During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval.

(1) During the ground disturbance phases of the project, the project owner shall include in the MCR to the CPM copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained and made available for audit by the CPM as needed.

(2) Within 24 hours of recognition of a non-compliance issue, the CRS shall notify the CPM by telephone of the problem and of ~~steps being taken~~ actions underway to resolve the problem. The telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance with conditions of certification. In the event of a non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness or the resolution measures, shall be provided in the next MCR.

(3) One week prior to ground disturbance in areas where there is a potential to discover Native American artifacts, the project owner shall send notification to the CPM identifying the person(s) retained at a minimum, an on-call basis to conduct Native American monitoring. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

~~**CUL-7** If the construction and laydown areas are to be located anywhere but in an area defined as 1) a 10-acre parcel at 3548/3600 Depot Road, 2) a 5-acre parcel at 3600 Enterprise Avenue, 3) approximately 10 acres of open and unused land surrounding PG&E's Eastshore Substation, or 4) 3500 Enterprise Avenue, 3458 Enterprise Avenue, 3440 Enterprise Avenue or 3643 and 3639 Depot Road, then a cultural resources assessment shall be conducted. The cultural resource assessment shall consist of a records search and a pedestrian survey that gives equal emphasis to prehistoric and historic resources and an evaluation of significance for any resources that are within or adjacent to the parking area or laydown boundaries. All cultural resources identified within or adjacent to the~~

~~project shall be recorded on a DPR form 523A. If Native American artifacts may be encountered, a monitor with historic ties to the affected area shall be retained as part of the cultural resources team during any surveys or subsurface investigation.~~

~~Verification:~~ ~~At least 30 days prior to the start of ground disturbance at the newly identified location(s) of the parking or laydown areas, the project owner shall submit the results of the records search and the results of the survey for approval by the CPM. An evaluation, including site records, of all cultural resources within or adjacent to the parking and laydown area boundaries shall also be submitted. The information shall also include the name and tribal affiliation of the Native American monitor, if a Native American monitor has been retained.~~

CUL-7 Prior to any form of debris removal, ground clearing, or grading at the Aladdin Parcel, Transmission Line Route Alternative 2, and portions of Alternative 1 subject to ground disturbance, the CPM shall be informed via e-mail or other method acceptable to the CPM, that debris removal, ground clearing, or grading is about to occur. The project owner shall ensure that the CRS, alternate CRS, or CRM(s) monitors full time (one person monitoring each large piece of machinery) during the removal of old vehicles, storage containers, gravel, debris, and overburden and during grading at the Aladdin Parcel, at Transmission Line Route Alternative 1 locations where ground disturbance is likely, and along Transmission Line Route Alternative 2. If there is a discovery during the removal process, then the Cultural Resources conditions of certification shall apply.

After removal of the various kinds of debris obscuring the ground surface, the CRS shall examine cleared ground as it is revealed, or conduct or oversee an archaeological pedestrian survey of the project site and linear locations not previously surveyed. If there is a discovery during the examination or survey, then the Cultural Resources conditions of certification shall apply. After completion of each examination or pedestrian archaeological survey, and prior to any grading or ground disturbance, a letter report from the CRS identifying monitoring and survey personnel and detailing the examination or survey methods, procedures, location, and results shall be provided to the CPM for review and approval.

Verification: One week prior to any form of debris removal, ground clearing or grading at the Aladdin Parcel, Alternative 2 transmission line route, and Alternative 1 Transmission Line Route where there may be ground disturbance, the project owner shall inform the CPM via e-mail, or another method acceptable to the CPM, that the debris removal, ground clearing, or grading will begin within one week and that the CRS, alternate CRS or CRM(s) are available to monitor. No later than one week after completion of each cleared earth examination or survey, and prior to any additional grading or ground disturbance, a letter report identifying survey personnel and detailing the methods, procedures, location, and results of the examinations or surveys shall be provided to the CPM for review and approval.

REFERENCES

CEC 2001a-Calpine Corp./Hildebrand (tn: 20373). Application for Certification.

CEC 2002b-California Energy Commission/Commissioners (tn: 26635). Commission Decision for Russell City–POS.

CH2MHILL 2007a-CH2MHILL/D.M. Davy (tn: 38948). Owner's Responses to Staff Data Requests 1-52. Cover letter docketed, transmittal letter, and attached POS. 01/17/2007. Received 1/17/07.

CH2MHILL 2007c-CH2MHILL/D.M. Davy. Owner's Response to CEC Staff Data Request #28, Final Geotechnical Report for the Russell City Energy Center Amendment No. 1(0-AFC-07 C).

CH2MHILL 2007d-CH2MHILL/D.M. Davy. Owner's Response to CEC Staff Data Requests 57 and 62. Response to Data Requests 73 through 96 and Workshop Queries 1 through 3. Includes Cultural Resources (57S-62S). Received April 2007.

RC 2006a-Russell City/M. Hartfield (tn: 38410). Petition for Amendment NO.1, Russell City Energy Center. 11/17/2006. Received 11/17/2006.

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Alvin J. Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

Staff concludes that the proposed Amendment to the Russell City Energy Center (RCEC) does not significantly change the analysis conducted for the original construction project in the area of hazardous materials management, but does change the analysis for the operations phase in the area of hazardous materials management. Staff, therefore, proposes the amendment of five conditions of certification, the deletion of one condition, and the acceptance of three new conditions.

INTRODUCTION

This analysis focused only on changes to the original RCEC that may affect hazardous materials management. (See original Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF) The changes evaluated in this assessment include the relocation of the project site, the change of cooling technology to a Zero Liquid Discharge (ZLD) system, the addition of a Title 22 recycling water facility, the removal of the Advanced Water Treatment (AWT) facility, the relocation of the aqueous ammonia tank, and the new natural gas pipeline route. The original analysis for hazardous materials management can be found in the Final Staff Assessment (FSA) dated June 2002 (CEC 2002a).

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

There is one new Federal LORS affecting this project in the area of hazardous materials management. On April 9, 2007, the U.S Department of Homeland Security (DHS) published in the Federal Register (6 CFR Part 27) an Interim Final Rule requiring that facilities that use or store certain hazardous materials conduct Vulnerability Assessments and implement certain specified security measures. This rule applies to aqueous ammonia solutions of 20 percent or greater and this proposed facility plans to utilize 29 percent aqueous ammonia.

SETTING

The RCEC Amendment proposes to relocate the project site about 1,300 feet north and west, as well as rearrange the site plan and change portions of the transmission line and gas pipeline routes. Please refer to the **Project Description** section for more details.

The locations of sensitive receptors and residences relative to the project site have changed slightly as a result of the new location. The nearest residence is now 0.96 miles from the proposed site (as opposed to 0.82 miles previously) and other receptors are located within plus or minus 500 feet of the distances quoted in the original

Application for Certification (AFC). The amendment states that there are no sensitive receptors immediately adjacent to the project site (RCEC Amendment Section 3.6.1 and Figure 3.1D-1).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Please refer to the FSA dated June 2002 (CEC 2002a).

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

Staff concludes that the proposed Amendment to the RCEC does not significantly change the analysis conducted for the original project in the area of hazardous materials management during the construction phase.

Operation Impacts and Mitigation

The use of a ZLD system, the removal of the AWT facility, and the addition of a Title 22 recycled water facility will result in changes to the RCEC chemical inventory. The project owner provided a revised list of chemicals and their storage locations (see Tables 3.5-1 through -3, RCEC Amendment). Staff finds that the changes to types and quantities of hazardous materials used and stored at the RCEC are minor and do not represent added risks beyond those evaluated in the original FSA.

The relocation and apparent redesign of the 29 percent aqueous ammonia tank and the ammonia facility as a whole will result in changes in impacts to off-site receptors in the event of an accidental spill of ammonia. The project owner prepared a new Off-Site Consequence Analysis (OCA) to evaluate the potential impacts of an ammonia spill with the new configuration. Staff reviewed the results of the OCA and found that the modeling was not consistent with previous modeling using the model SLAB. Staff cannot explain the discrepancies in the OCA modeling and thus conducted its own independent modeling using the U.S. EPA's SCREEN3 model. The results of this model show significant impacts off-site if an accidental release were to occur and fill the secondary containment area of 1,463 square feet with aqueous ammonia. Staff notes that the original AFC described the secondary containment structure differently with a greatly reduced surface area of any spilled ammonia, approximately the size of the originally-proposed vent (one foot diameter; AFC page 8.5-13). Therefore, staff is proposing amending Condition of Certification **HAZ-4** requiring the project owner to design and build the secondary ammonia containment structure and the ammonia tanker transfer pad as per the original AFC (AFC page 8.5-17) or the equivalent. In this case, the secondary containment structure around the aqueous ammonia storage tank would be covered and a spill on the transfer pad would drain into the covered containment structure. Furthermore, staff proposes an additional Condition of Certification **HAZ-11,** to ensure that ammonia sensors are installed as per the original AFC (AFC page 8.5-17).

Staff recommends amending the following Conditions of Certification:

HAZ-1: to reflect a change in reference to a table of hazardous materials allowed for use at the facility.

HAZ-4: to reflect a change in the aqueous ammonia secondary containment structure.

HAZ-5: to reflect a change in the distance (100 feet to 50 feet) between flammable materials and the sulfuric acid tank (as described above).

HAZ-8 and **9**: to reflect that the project owner is responsible for inspecting only that portion of the natural gas pipeline owned by the project.

Staff recommends the deletion of **HAZ-10** because this requirement pertains mostly to the pipeline segment to be built, owned, and operated by PG&E and that portion owned by the project must follow these design criteria in any event (the criteria are LORS), thus making this condition redundant.

Site Security

This facility proposes to use hazardous materials that have been identified by the US EPA as materials where special site security measures should be developed and implemented to ensure that unauthorized access is prevented. The EPA published a Chemical Accident Prevention Alert regarding Site Security (EPA 2000), the U.S. Department of Justice published a special report on Chemical Facility Vulnerability Assessment Methodology (US DOJ 2002), the North American Electric Reliability Council published Security Guidelines for the Electricity Sector in 2002 (NERC 2002), and the U.S. Department of Energy published a draft Vulnerability Assessment methodology for Electric Power Infrastructure in 2002 (DOE 2002). The energy generation sector is one of the 14 areas of Critical Infrastructure listed by the DHS. On April 9, 2007, the DHS published in the Federal Register (6 CFR Part 27) an Interim Final Rule requiring that facilities that use or store certain hazardous materials conduct Vulnerability Assessments and implement certain specified security measures. This rule applies to aqueous ammonia solutions of 20 percent or greater and this proposed facility plans to utilize 29 percent aqueous ammonia. Therefore, in order to ensure that this facility or that a shipment of hazardous material is not the target of unauthorized access, staff's newly proposed Conditions of Certification **HAZ-12 and 13** address both a Construction Security Plan and an Operations Security Plan. These plans would require the implementation of Site Security measures consistent with the above-referenced documents and Energy Commission guidelines.

The goal of these conditions of certification is to provide for the minimum level of security for power plants to protect California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for this power plant is dependent upon the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. The results of the off-site consequence analysis prepared as part of the Risk Management Plan will be used, in part, to

determine the severity of consequences of a catastrophic event. In order to determine the level of security, Energy Commission staff will provide guidance in the form of a vulnerability assessment (VA) decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the NERC 2002 guidelines, the U.S. Department of Energy VAM-CF model, and the DHS regulations published in the Federal Register (Interim Final Rule 6 CFR Part 27). Basic site security measures shall be required at all locations in order to protect the infrastructure and electrical power generation within the state.

These measures will include perimeter fencing and detectors, possibly guards, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of security breach. Site access for vendors shall be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors will have to maintain their transport vehicle fleet and employ only drivers properly licensed and trained. The project owner will be required, through the use of contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. Department of Transportation requirements for Hazardous Materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 1572, Subparts A and B. The Compliance Project Manager (CPM) may authorize modifications to these measures, or may require additional measures in response to additional guidance provided by DHS, the U.S. Department of Energy, or the North American Electric Reliability Council, after consultation with appropriate law enforcement agencies and the project owner.

CUMULATIVE IMPACTS AND MITIGATION

The project owner identified several facilities in the vicinity of the proposed RCEC site that use and store ammonia (see RCEC Amendment Table 3.5-5), which is the only chemical stored at RCEC with a potential to cause a cumulative impact. The Amendment states that due to the results of the OCA and the nearest facility being 0.47 miles away there is no significant potential for cumulative impacts from ammonia spills to occur. Staff agrees with this conclusion since it is highly unlikely that an ammonia spill would occur at two facilities at the same time, and even if such an event should occur, the mitigation measures proposed by staff and the distance between the RCEC and the nearest facility are sufficient to ensure that the plumes will not combine at an airborne concentration that would adversely impact public health. Therefore no cumulative impacts are expected from the use and storage of hazardous materials.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Mr. J.V. McCarthy, USAR retired, of 732 B. St., Hayward commented about the possibility that a large-scale flash fire could occur as a result of a major gas leak during a full power generation period. He expressed concern about major impacts from such a fire.

Response: Natural gas does pose a risk of fire and/or possible explosion if a release were to occur under certain specific conditions. However, it should be noted that, due

to its tendency to disperse rapidly, natural gas is less likely to cause explosions than many other fuel gases, such as propane or liquefied petroleum gas. While natural gas will be used in significant quantities at the RCEC, it will not be stored on-site. The risk of a fire and/or explosion on-site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of effective safety management practices such as National Fire Protection Association (NFPA) code 85A. Adherence to this code, and other state and local fire codes, is required and will significantly reduce the likelihood of an explosion in gas-fired equipment. Automatic and manual shut-off valves will control the flow of natural gas. The safety management plan proposed by the project owner would address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error. Furthermore, the RCEC will rely on both onsite fire detection and suppression systems and local fire protection services. The onsite fire detection and suppression systems provide the first line of defense for small fires. In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, would be provided by the Hayward Fire Department. Therefore, it is staff's position that the combination of engineering controls, fire detection and suppression systems, and off-site fire department response will reduce the risk of a major fire occurring or impacting the public to insignificance.

CONCLUSIONS

Staff concludes that the proposed RCEC amendment does not significantly change the analysis conducted for the original project in the area of hazardous materials management for construction, but for the operations phase, the analysis in the area of hazardous materials management does change. The mitigation measures proposed in the original FSA, combined with staff's proposed amendments to five conditions of certification, the deletion of one condition, and three new conditions, would be sufficient to reduce impacts from the use and storage of hazardous materials to less than significant.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of the Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout is used to indicate deleted language and underline for new language.

HAZ-1 The project owner shall not use any hazardous material in any quantity or strength not listed in ~~AFC Tables 8.5-3 and 8.5-6~~ Tables 3.5-1 and 3.5-2 of the amendment unless reviewed in advance by the Hayward Fire Department and approved in advance by the CPM.

Verification: The project owner shall provide to the Compliance Project Manager (CPM), in the Annual Compliance Report, a list of all hazardous materials contained at the facility. If any changes are requested, the project owner shall do so in writing, with a

copy to the Hayward Fire Department, at least 30 days before the change is needed, to the CPM for approval.

HAZ-2 The project owner shall provide a Risk Management Plan (RMP) and a Hazardous Materials Business Plan (HMBP), (that shall include the proposed building chemical inventory as per the UFC) to the City of Hayward Fire Department and the CPM for review at the time the RMP plan is first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall include all recommendations of the City of Hayward Fire Department and the CPM in the final documents. A copy of the final plans, including all comments, shall be provided to the City of Hayward and the CPM once EPA approves the RMP.

Verification: At least 60 days prior to construction of hazardous materials storage facilities and control systems, the project owner shall provide the final plans (RMP and HMBP) listed above and accepted by the City of Hayward to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan (SMP) for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of aqueous ammonia with incompatible hazardous materials.

Verification: At least sixty days prior to the delivery of aqueous ammonia to the ammonia storage tanks, the project owner shall provide a ~~Safety Management Plan~~ SMP as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage facility shall be designed and built to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 125 percent of the storage volume or the storage volume plus the volume associated with 24 hours of rain assuming the 25-year storm, and shall be covered so that only drain holes or spaces or vents are open to the atmosphere. The aqueous ammonia tanker truck transfer pad shall be designed so that any spill drains to the covered secondary containment structure. The final design drawings and specifications for the ammonia storage tank, the tanker truck transfer pad, and secondary containment basin shall be submitted to the CPM.

Verification: At least sixty (60) days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings and specifications for the ammonia storage tank, the tanker truck transfer pad, and secondary containment basin(s) to the CPM for review and approval.

HAZ-5 The project owner shall ensure that no combustible or flammable material is stored, used, or transported within ~~100~~ 50 feet of the sulfuric acid tank.

Verification: At least sixty (60) days prior to receipt of sulfuric acid on-site, the project owner shall provide to the CPM for review and approval copies of the facility design drawings showing the location of the sulfuric acid storage tank and the location

of any tanks, drums, or piping containing any combustible or flammable material and the route by which such materials will be transported through the facility.

HAZ-6 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles, which meet or exceed the specifications of DOT Code MC-307.

Verification: At least sixty (60) days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-7 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM (SR92 to Clawiter to Enterprise to the facility).

Verification: At least 60 days prior to receipt of any hazardous materials on site, the project owner shall submit to the CPM for review and approval, a copy of the letter to be mailed to the vendors. The letter shall state the required transportation route limitation.

HAZ-8 The project owner shall ensure ~~require~~ that the portion of the natural gas pipeline owned by the project undergo a complete design review and detailed inspection ~~every~~ 30 years after initial installation and each 5 years thereafter.

Verification: At least thirty days prior to the initial flow of gas in the pipeline, the project owner shall provide a detailed plan to accomplish a full and comprehensive pipeline design review to the CPM for review and approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, not later than one year before the plan is implemented.

HAZ-9 After any significant seismic event in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline portion owned by the project shall be inspected by the project owner.

Verification: At least thirty days prior to the initial flow of gas in the pipeline, the project owner shall provide to the CPM a detailed plan to accomplish a full and comprehensive ~~pipeline~~ inspection of that portion of the pipeline owned by the project in the event of an earthquake for review and approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, at least every five years.

~~**HAZ-10** The natural gas pipeline shall be designed to meet CPUC General Order 112-D&E and 58 A standards, or any successor standards, and will be designed to meet Class III service. The pipeline will be designed to withstand seismic stresses and will be leak surveyed annually for leakage. The project owner shall incorporate the following safety features into the design and operation of the natural gas pipeline: (1) butt welds will be x-rayed and the pipeline will be pressure tested prior to the introduction of natural gas into the line; (2) the pipeline will be surveyed for leakage annually; (3) the pipeline route will be marked to prevent rupture by heavy equipment excavating in the area; and (4) valves will be installed to isolate the line if a leak occurs.~~

~~**Verification:** Prior to the introduction of natural gas into the pipeline, the project owner shall submit design and operation specifications of the pipelines to the CPM for review and approval.~~

HAZ-11 Ammonia sensors shall be installed, operated, and maintained around the aqueous ammonia storage tank and tanker truck transfer pad. The number, specific locations, and specifications of the ammonia sensors shall be submitted to the CPM.

Verification: At least sixty (60) days prior to delivery of aqueous ammonia to the facility, the project owner shall submit final design drawings showing the number, location, and specifications of the ammonia sensors to the CPM for review and approval.

HAZ-12 At least 30 days prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Site Security Plan shall include the following:

1. Perimeter security consisting of fencing enclosing the construction area;
2. Security guards;
3. Site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
5. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. Evacuation procedures.

Verification: At least thirty (30) days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Site Security Plan is available for review and approval.

HAZ-13 In order to determine the level of security appropriate for this power plant, the project owner shall prepare a Vulnerability Assessment and submit that assessment as part of the Operations Security Plan to the CPM for review and approval. The Vulnerability Assessment shall be prepared according to guidelines issued by the North American Electrical Reliability Council (NERC 2002), the U.S. Department of Energy (DOE 2002), and the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002). Physical site security shall be consistent with the guidelines issued by the NERC (Version 1.0, June 14, 2002) and the DOE (2002) and will also be based, in part, on the use, storage, and quantity of hazardous materials present at the facility.

The project owner shall also prepare a site-specific Security Plan for the operational phase that shall be made available on-site to the CPM for review and approval. The project owner shall implement site security measures

addressing physical site security and hazardous materials storage. The level of security to be implemented will be determined by the results of the Vulnerability Assessment but in no case shall the level of security be less than that described as below (as per NERC 2002).

The Operation Security Plan shall include the following:

1. Permanent full perimeter fence or wall, at least 8 feet high;
2. Main entrance security gate, either hand operable or motorized;
3. Evacuation procedures;
4. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. Written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on-site or off-site;
6. a. A statement (refer to sample, attachment "A") signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to ascertain the accuracy of employee identity and employment history, and shall be conducted in accordance with state and federal law regarding security and privacy;

   b. A statement(s) (refer to sample, attachment "B") signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner) that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractor personnel that visit the project site.
7. Site access controls for employees, contractors, vendors, and visitors;
8. Requirements for Hazardous Materials vendors to prepare and implement security plans as per 49 CFR 172.800 and to ensure that all hazardous materials drivers are in compliance with personnel background security checks as per 49 CFR Part 1572, Subparts A and B;
9. Closed Circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) capable of viewing, at a minimum, the main entrance gate and the ammonia storage tank; and
10. Additional measures to ensure adequate perimeter security consisting of either:

    Security guards present 24 hours per day, 7 days per week.

    or

Power plant personnel on-site 24 hours per day, 7 days per week and **all** of the following:

1. The CCTV monitoring system required in number 9 above shall include cameras that are able to pan, tilt, and zoom (PTZ), have low-light capability, are recordable, and are able to view 100 percent of the perimeter fence, the ammonia storage tank, the outside entrance to the control room, and the front gate from a monitor in the power plant control room; **and**
2. Perimeter breach detectors **or** on-site motion detectors.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to the security plans. The CPM may authorize modifications to these measures, or may require additional measures, such as protective barriers for critical power pant components (e.g., transformers, gas lines, compressors, etc.) depending on circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with appropriate law enforcement agencies and the project owner.

Verification: At least 30 days prior to the initial receipt of hazardous materials on-site, the project owner shall notify the CPM that a site-specific Vulnerability Assessment and Operations Site Security Plan are available for review and approval.

REFERENCES

California Energy Commission (CEC), 2002a. Final Staff Assessment (FSA) and Addendum, Comments on the FSA, published on June 10, 2002.

Environmental Protection Agency (EPA). 2000. Chemical Accident Prevention: Site Security. Environmental Protection Agency, Office of Solid Waste and Emergency Response. February 2000.

North American Electric Reliability Council (NAERC) 2002. Security Guidelines for the Electricity Sector, Version 1.0, June 14, 2002.

U.S. Department of Energy (US DOE) 2002. Draft Vulnerability Assessment Methodology, Electric Power Infrastructure. Office of Energy Assurance, September 30, 2002.

U.S. Department of Justice (US DOJ) 2002. Special Report: Chemical Facility Vulnerability Assessment Methodology. Office of Justice Programs, Washington, D.C. July 2002.

LAND USE

Testimony of Shaelyn Strattan

SUMMARY OF CONCLUSIONS

- The Russell City Energy Center (RCEC) project, as amended, is consistent with all federal and state laws, ordinances, regulations, and standards (LORS); would not physically disrupt or divide an established community or conflict with any applicable habitat conservation plan or natural community conservation plan; result in any impacts to existing agricultural operations or future use; convert Farmland to non-agricultural use; or conflict with existing agricultural zoning or Williamson Act contracts. The project is consistent with the applicable 2002 General Plan policies and strategies and the project's proposed location is zoned Industrial, which is consistent with the Industrial Corridor General Plan land use designation. Full implementation of all project conditions of certification, including **LAND-1**, would make the off-site parking component of the proposed project, as amended, consistent with all applicable LORS.

- Power plant operation, as proposed in this Amendment, is consistent with the primary use classification of "manufacturing" in the Industrial Zone, but would normally require a conditional use permit (CUP). Energy Commission staff is unable to make the CUP-required findings that the proposed use would not be detrimental to the public health, safety, or general welfare or that the proposed use is in harmony with applicable City policies and the intent and purpose of the zoning district involved, due to the potential for the project to introduce an aviation safety hazard into the Hayward Executive Airport operational airspace. Approval of the RCEC project, as amended, without meeting the requirements for a CUP, would be inconsistent with the HMC §10-1.1620(b)(1)(a) and §10-1.3225.

- Based on information received to date, it appears that the thermal plumes generated by the RCEC project have the potential to endanger the maneuverability of aircraft within the Hayward Airport Approach Zoning Plan boundaries; Hazard Protection Zone (HPZ); proposed Airport Influence Area (AIA), and transitional airspace for the Hayward Executive Airport. Therefore, siting of this project at the proposed location would be inconsistent with HMC §10-6.35, the current ALUPP, and proposed draft ALUCP.

- Generation of thermal plumes that could jeopardize the safety of aircraft operating within this airspace or persons living or working in the vicinity of the airport is considered by Energy Commission staff to be more objectionable than other uses within the Industrial District that do not create a similar hazard. Therefore, based on information available to date, siting of the project at the proposed location is inconsistent with HMC §10-1.140.

If the Energy Commission elects to grant certification for this project, as amended, Energy Commission staff recommends modification of both original Land Use conditions of certification, as indicated in the **Proposed Modifications to Conditions of Certification** included in this section of the Staff Assessment. However, in Energy

Commission staff's opinion, implementation of these Conditions of Certification would not resolve the project's inconsistency with City of Hayward LORS.[1]

INTRODUCTION

The Land Use analysis of the RCEC Amendment 1 (Amendment) focuses on aspects of the proposed changes that may impact the project's consistency with land use plans, ordinances, regulations, and policies, and the project's compatibility with existing or reasonably foreseeable land uses. This analysis covers only those aspects of the RCEC project that have changed as a result of the proposed amendment and that affect staff's analysis and testimony for Land Use as contained in the Commission Decision (Decision) dated September 11, 2002. (See original Decision at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.)

The RCEC Amendment (RCEC 2006) proposes to relocate the RCEC facilities approximately 1,300 feet north-northwest of the original project site. Although the distance is limited, the new location presents several land use concerns not associated with the original site, including location within a Federal Emergency Management Agency (FEMA) Zone A 100-year floodplain, multiple parcels in two separate jurisdictions (Alameda County and the City of Hayward), and proximity to a sensitive natural resource area. Additionally, although both the original and proposed site are located within the Hayward Airport Approach Control Zoning Plan area, as defined in Hayward Municipal Code §§10-6.00 *et seq*., the original project review did not consider the potential aviation safety hazards associated with the project's thermal plumes. This issue is addressed as part of this analysis.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

There are several new or revised land use LORS that would be applicable to the amended project (see **LAND USE Table 1** below).

Unlike the original location, the new site is located within Zone A of a FEMA-designated 100-year Flood Plain and is, therefore, subject to the local and federal requirements pursuant to implementation of the National Flood Insurance Program (NFIP). Areas included in the Mt. Eden Annexation Project (including the Depot Road Island area containing a portion of the project site) are also subject to the associated mitigation measures detailed in the Mt. Eden Prezoning and Annexation Project FEIR (Hayward 2004), in compliance with the California Environmental Quality Act (CEQA). The project

[1] NOTE: The potential for thermal plumes to disturb atmospheric stability to more than 1,000 feet AGL, resulting in turbulence with the potential to adversely affect aircraft maneuverability, is well established. However, the extent of the potential aviation safety impact, as it relates to this specific project, is still being analyzed (see **Traffic and Transportation** section of this document). This Staff Assessment will be circulated to interested agencies, including the Federal Aviation Administration (FAA), California Division of Aeronautics (Caltrans), Alameda County Airport Land Use Commission, City of Hayward Public Works, and Hayward Executive Airport management, for additional comments. Information received during the public review period for this document, as well as the results of on-going aviation safety analyses, may result in amendments to this assessment, additional conditions of certification, or a revised conclusion.

is located within the Hayward Airport Approach Zoning Plan area and is, therefore, subject to Hayward Municipal Code §§10-6. Airport land use considerations that relate to the Hayward Executive Airport are also subject to the requirements of the Alameda County Land Use Compatibility Plan (ALUCP).

LAND USE Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
National Flood Insurance Program (NFIP)	The floodplain management requirements under NFIP are designed to prevent new development from increasing the flood threat and protect new and existing buildings from anticipated flood events. These regulations were not applicable to the original application. The original site was not located in a FEMA Flood Hazard Zone.
Federal Aviation Regulation (FAR) 77	This regulation addresses structural objects obstructing navigable airspace and was addressed in the original Application for Certification (AFC) Staff Assessment. Relocation of the project does not change staff's original assessment of "No Impact" from built structures.
State	No Changes
Local	
San Francisco Bay Plan	The San Francisco Bay Plan [McAteer-Petris Act (Cal. Govt. Code §§66600 – 66694)] is an enforceable plan to guide the future protection and use of San Francisco Bay and its shoreline. Its applicability to this project was adequately addressed in the original AFC Staff Assessment. Relocation of the project does not change staff's original assessment of "No Impact".
Alameda County Alameda County Airport Land Use Compatibility Plan (ALUCP)	(California Public Utilities Code §§21001 et seq, relating to the State Aeronautics Act.) An ALUCP provides for the orderly growth of an airport and the area surrounding the airport within the jurisdiction of the Airport Land Use Commissions, excluding existing land uses. Its primary function is to safeguard the general welfare of the inhabitants within the vicinity of the airport and the public in general. The Alameda County ALUCP works in concert with the Hayward General Plan and Zoning Codes, and the Hayward Executive Airport 2002 Master Plan. Both the original and proposed sites are subject to its provisions. However, applicability of this Plan to the proposed project was not addressed in original AFC Staff Assessment or Decision.
City of Hayward General Plan (revised 2002)	The 1986 General Plan was used for analysis of the original application, but was substantially revised in 2002, including addition of a Land Use element. The amended project is subject to the 2002 General Plan.
Municipal Code §§9-4 *et seq* Flood Plain Management	• §9-4.110(c)(2) General Construction Standards (Elevation and Floodproofing) identifies construction requirements for non-residential structures within the FEMA 100-year flood plain. This code section did not apply to the original site. It is discussed in this analysis, in conjunction with NFIP (FEMA) flood requirements and related Mt. Eden FEIR mitigations.

Municipal Code §§10-1 *et seq*	• §10-1.135 Exceptions (*to General Provisions of the Zoning Code*) • §10-1.140 Exclusionary Zoning Ordinance • §10-1.155 Prezoning or Interim Zoning of Unincorporated Lands (Ordinance #04-14, October 19, 2004) • §§10-1.1600 *et seq* - Industrial District (I); identifies permitted uses, standards, and restrictions applicable to development in those areas zoned Industrial. With the exception of §§10-1.1600 *et seq*, these code sections were not specifically addressed in the original AFC Staff Assessment or Decision, or the original site was not subject to their provisions.
Municipal Code §§10-3 *et seq*	• §10-3.2 Lot Line Adjustment Maps • §10-3.4 Merger of Contiguous Parcels Under Common Ownership These code sections were not specifically addressed in the original AFC Staff Assessment or Decision, or the original site was not subject to their provisions.
Municipal Code §10-6 - Airport Approach Zoning Regulations (Resolution #64-038; 9/15/64)	This code section addresses land use with the potential to impact aviation safety within an Airport Approach Zoning Plan area. This code section is applicable to both the original and proposed site, but was not addressed in original AFC Staff Assessment or Decision.
Mt. Eden Prezoning and Annexation Project FEIR (SCH#2003122009)	This document evaluates the potential environmental impacts related to annexation of land within the County of Alameda by the City of Hayward and identifies measures designed to mitigate those potential impacts resulting from future development of those areas. The original project site was not located in the Mt. Eden Annexation area; therefore, mitigation measures included in the Mt. Eden Annexation Final Environmental Impact Report (FEIR) were not applicable. The proposed project site is within the Mt. Eden Annexation Phase 1 boundaries and has been annexed by the City of Hayward. Development restrictions included as mitigation in the FEIR would now apply to three of the four properties that make up the proposed project site.

ANALYSIS

The RCEC Petition to Amend was reviewed by staff for potential environmental effects related to use of the land for the proposed project and consistency with applicable LORS. The original AFC Staff Assessment determined the project would not physically disrupt or divide an established community or conflict with any applicable habitat conservation plan or natural community conservation plan (CEC 2002a, pp.8, 10). Changes proposed in the project owner's Petition to Amend are not expected to alter that assessment.

Assessment of the project's potential to convert Prime or Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use or conflict with existing agricultural zoning or Williamson Act contracts was not discussed in the original project FSA or Decision. However, the proposed project site, pipeline and utility easements,

and transmission corridor do not border on any agricultural properties and neither construction nor operational activities would result in any impacts to existing agricultural operations or future use, convert Farmland to non-agricultural use, or conflict with existing agricultural zoning or Williamson Act contracts.

Consistency with applicable land use plans, policies, and regulations has been reassessed as a result of the proposed changes and is addressed in the sections below.

Site and Vicinity

See the **Project Description** section of this Staff Assessment for the overview, general description, and proposed project changes, including the new site location. As noted by the project owner (RCEC 2006, §3.6.1, p.3-105), the regional setting for the project has not changed and there is no substantial change in the site's relative location to sensitive land uses, such as schools and residential areas. The following describes the site and land use changes specific to this project amendment.

The newly proposed project site is located on the western edge of the City of Hayward's Industrial Corridor and immediately adjacent to the City levees, floodplain, and designated open space. The properties are currently used as a storage yard for pallets, automobile salvage yards, and sludge drying and stockpile area at the City of Hayward's Water Pollution Control Facility (WPCF).

LAND USE Table 2 shows the General Plan land use designations and **LAND USE Table 3** shows the Zoning District designations for parcels within one mile of the current project study area. Immediately across from the proposed project site, on the north side of Depot Road, is an Industrial/ Commercial Business Park, with additional vehicle salvage yards, similar to those on the project site, to the east and west, and the WPCF along Enterprise Road to the south and east. Other surrounding properties are used primarily for warehousing, and small wholesale/manufacturing, retail, and construction businesses, consistent with those identified in the RCEC Final Staff Assessment (FSA) and 2002 Decision.

LAND USE Table 2

General Plan Land Use Designations within the One-Mile Radius Project Study Area

Jurisdiction	General Plan Land Use Designation**
City of Hayward	North: Industrial Corridor, Open Space (Parks & Recreation to the northwest) South: Industrial Corridor, Open Space (Baylands): Transportation Corridor (SR92 Freeway) East*: Residential (small areas of low, limited medium, and high density residential to the northeast along edge of one-mile radius); Retail and Office Commercial (isolated pocket approximately one mile northeast of site) West: Open Space (Baylands); Industrial Corridor (a narrow strip containing the City's flood control channel abutting the project site)

**All uses except Industrial are generally located approximately one mile or farther northeast of the project site.*
***Source: Hayward 2007a*

LAND USE Table 3

Zoning Designations within the One-Mile Radius Project Study Area

Jurisdiction	Zoning Designation**
City of Hayward	North: Industrial (I); Flood Plain (FP); Planned Development (PD; northwest) South: Industrial; Flood Plain; Planned Development (along SR-92) East*: Single Family Residential/Minimum Lot Size – 5,000 ft^2 (RS) Medium Density Residential/Minimum Lot Area – 2,5000 ft^2 (RM) High Density Residential/Minimum Lot Area – 1,250 ft^2 (RH) Neighborhood Commercial (CN) Industrial; Light Manufacturing (LM); Business Park (BP) Planned Development West: Flood Plain; Industrial (a narrow strip containing the City's flood control channel abutting the project site)

**All uses except Industrial are generally located approximately one mile or farther northeast of the project site*
***Source: Hayward 2007b.*

The original RCEC site consisted of two parcels, totaling approximately 14.5 acres. As part of RCEC Amendment 1, the project owner proposes to move the power plant site approximately 1,300 feet north-northwest of the original certified site, along with limited extension and/or relocation of transmission corridors, utility and access easements, and construction parking and laydown areas (CEC 2006a).

In both the Petition to Amend and Data Response #29 (RCEC 2007a), the project owner indicated the proposed project site would consist of four parcels (APNs #439009900200, #439007000806, #439007001202, and #439007000900), totaling 18.8± acres. However, based on a City of Hayward Assessor's Office records search and consideration of the option agreements between the City of Hayward and the project owner (Hayward 2005, 2006), it appears the power plant site would specifically consist of three separate parcels (APNs #439007000806, #439007001202, and #439007000900) of 2.72± acres, 1.95± acres, and 8.23± acres, respectively; and a 5.0± acre portion of a fourth parcel (APN #439009900200).

At the time the RCEC Amendment 1 was received by the Energy Commission, one property (a 5± acre portion of APN 439009900200) contained within the proposed site boundaries was within the Hayward city limits and City of Hayward jurisdiction. The remaining three parcels (APNs 439007000806, 439007000900, and 439007001202) were also within the Hayward city limits, but remained part of Alameda County. On February 2, 2007, the Alameda Local Agency Formation Commission (LAFCO) approved the annexation of Phase I of the Mt. Eden Reorganization Annexation of Territory and Detachment from the Alameda County Library District and the Alameda County Fire Department Project (LAFCO 2007). This included the area known as the Depot Road unincorporated island (generally located along and to the south of Depot Road and west of Connecticut Street). All three Alameda County project-related parcels were within the Depot Road Island boundaries. As of March 5, 2007, these parcels were officially annexed into the City of Hayward. All four properties that make up the proposed project site are now within City of Hayward jurisdiction and have the same Industrial Corridor land use and Industrial Zoning District designations as the original

project site, consistent with Hayward Municipal Code §10-1.155 and prezoning Ordinance #04-14 (October 19, 2004).

The project's location along the western edge of the City of Hayward's Industrial Corridor is in an area that supports both heavy and mixed industrial/commercial activities (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). The General Plan designations, zoning, and uses for adjacent properties remain consistent with those indicated for the original project site.

The project site is also approximately 1-1/2 miles southwest of the Hayward Executive Airport and is within the Hayward Airport Approach Zoning Plan area (AAZP) and the General Referral Area/Hazard Prevention Zone (HPZ), as identified in the 1986 Alameda County Airport Land Use Compatibility Plan (ALUCP), for this facility. Properties within the AAZP, which extends approximately two miles out from the airport runways, and the HPZ, with irregular boundaries extending outward up to three miles from the airport, are subject to restrictions regarding land uses that could present a hazard to aircraft navigation [HMC(c), §10-6; ALUCP Chapter II(C), pp.12-13].

COMPLIANCE WITH LORS

As required by California Code of Regulations (CCR) Title 20, Section 1744, Energy Commission staff evaluates the information provided by the project owner in the AFC (and any Amendments) to determine if elements of the proposed project would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, or that would normally have jurisdiction over the project except for the Energy Commission's overriding authority. The following analyses address LORS that did not previously apply to the project or were not considered in the original FSA or Decision.

National Flood Insurance Program (NFIP)

The proposed project is not located on federally administered lands, but is located in FEMA Zone A, 100-year Flood Plain, and is, therefore, subject to the local and federal requirements pursuant to implementation of the National Flood Insurance Program (NFIP), including the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.); the National Flood Insurance Act of 1968, as amended (42 U.S.C. 40011 et seq.); the Flood Disaster Protection Act of 1973 (Public Law 93-234, 87 Stat. 975); and Executive Order 11988 of May 24, 1977 (42 FR 26971, 3 CFR, 1977 Comp., p. 117). Hayward Municipal Code §§9-4, Flood Plain Management, ensures local compliance with the eligibility requirements of NFIP and specifies construction requirements for non-residential structures within the FEMA 100-year flood plain. (FEMA 2000; NFIP)

Section 3.10.1.2 of the AFC Petition to Amend the Project indicates the proposed project site is within FEMA's 100-year floodplain. The original location was not within

the floodplain. RCEC Amendment Figure 3.10-1 (**LAND USE Figure 2**) correlates with the NFIP Flood Insurance Rate Map for Alameda County (FEMA 2000), which identifies the site as within FEMA Flood Zone A1 (a Special Flood Hazard Area where base flood elevations have been determined). The base flood elevation for the area containing the majority of the project site is seven-foot mean sea level (MSL). (See **LAND USE Figure 3.**) The site elevation ranges from a few isolated areas below seven feet MSL, in the areas adjacent to the City's flood control channel, to an average of 9-9.5 feet MSL across the remainder of the site (Amendment Figure 2.2.1). The far eastern edge of the site is located outside the 500-year floodplain, in FEMA Zone C.

Therefore, based on NFIP flood management requirements; Hayward Municipal Code §9-4.110(c)(2); and Mt. Eden Annexation Project FEIR, Mitigation Measure 4.3-4, Energy Commission staff is proposing Condition of Certification **SOIL AND WATER-7** (see **Soil And Water** section of this document), requiring the project owner to ensure that the project and its associated facilities are elevated to a level above the base flood elevation and constructed in compliance with the applicable provisions of Hayward Municipal Code §9-4. Compliance with Condition **SOIL AND WATER-7** would result in project consistency with both federal and local flood plain regulatory programs and City of Hayward land use requirements for development within a floodplain. It will also meet the mitigation requirements identified in the Mt. Eden Annexation Project FEIR (Hayward 2004; see City of Hayward LORS section below).

Alameda County

Alameda County Airport Land Use Policy Plan (ALUPP)

The Alameda County ALUPP was adopted on July 16, 1986 by the Alameda County Airport Land Use Commission (ALUC) and provides a framework for reviewing significant proposals for future airport development. The ALUC's public mandate is to protect the public health, safety, and welfare by promoting orderly expansion of airports and adoption of land use measures by local public agencies to minimize exposure to excessive noise and safety hazards near airports. (ACALUC 1986) ALUC safety compatibility policies address both protection of people and property on the ground near airports and protection of airport airspace from obstructions and other hazards to flight. (Caltrans 2002; Summary, p.6.) Hayward Executive Airport (Hayward Air Terminal when the current ALUPP was adopted) is within ALUC jurisdiction. The current ALUPP is consistent with the Hayward Air Terminal Master Plan Study (HWD 1983; Hayward 1983) and City of Hayward Ordinance 64-038, Airport Approach Zoning Plan, which were both in force at the time the ALUCP was adopted. The Hayward Executive Airport Master Plan (HWD 2002) has also been found to be consistent with the current ALUPP (ACALUC 2007).

Both the original and proposed project sites are located within the ALUPP General Referral Area/Hazard Prevention Zone for Hayward Executive Airport, which prohibits uses that would cause hazards to air navigation (ACALUC 1986, p.56). However, the potential aviation safety hazards associated with the project's thermal plumes were not addressed by the project owner in the AFC or Amendment 1 and were not included in the original FSA or Decision. The ALUPP hazard prevention policy elements are incorporated into and implemented by the City of Hayward's Airport Approach Zoning Regulations. (Please see the City of Hayward LORS, Section 10-6, Airport Approach Zoning Regulations below for discussion of project consistency with the ALUPP.)

City of Hayward

The Russell City Energy Center, as amended, would be a load following, 600 megawatt, natural gas-fired, combined-cycle facility, with nine cooling towers (64 feet tall) and two 145-foot-tall Heat Recovery Steam Generator (HRSG) stacks. As noted in the project owner's Petition to Amend, the proposed project site has been moved approximately 1,300 feet north-northwest of the original certified site, and includes minor alterations to the original plant layout and design. At the time the project owner's Petition to Amend was submitted to the Commission, the site contained properties within both Alameda County and City of Hayward jurisdictional boundaries. However, following annexation of the Depot Road Island area by the City of Hayward on March 5, 2007, as part of Phase I of the Mt. Eden Annexation Project, all properties that would make up the proposed project site, including transmission corridors, utility and access easements, and construction parking and laydown areas, would be part of the City of Hayward. They would, therefore, be subject to the current City of Hayward LORS, including the Hayward General Plan (2002) and Municipal (Zoning) Code.

General Plan

The Hayward General Plan contains seven elements and is the basis for determining acceptable land uses and related park, road, and other infrastructure needs within the City of Hayward jurisdiction. The Land Use Element of the Hayward General Plan, added as part of the July 2002 General Plan update, identifies the goals and policies necessary to maintain and enhance neighborhoods, commercial and industrial areas, and surrounding open space. It addresses land use issues previously discussed in the General Policies Plan of the 1986 Hayward General Plan. The Economic Development Element of the 2002 General Plan identifies the current economic conditions, constraints, and opportunities in the City of Hayward and, in conjunction with Land Use, Circulation, and Housing Elements, provides guidance when considering specific projects and analysis of long-term impacts. These issues were previously discussed in the Growth Management Element of the 1986 General Plan. The 2002 General Plan supersedes the 1986 Hayward General Plan which was in effect at the time the original RCEC project was certified.

The proposed project site is designated as part of the Industrial Corridor in the 2002 Hayward General Plan. This is the same land use designation as the original project site. However, the 1986 General Plan was substantially revised in 2002 and did not include a separate Land Use Element or an in-depth discussion of the City's plans for the Industrial Corridor. Plans and goals for the Industrial Corridor are now specifically discussed in the Focus Area section of the Land Use Element, with primary emphasis on future changes that have yet to be codified or implemented. These include the potential for multiple zoning districts within the Industrial Corridor; integration or separation of land uses, based on the presence of hazardous materials or intensity of use; the need for additional parking, compared to the current limited demands at warehouse facilities; and an increase in minimum parcel size to accommodate the larger scale manufacturing or research and development operations. (Hayward 2002, Land Use Element, pp. 12-21).

The Land Use Policies and Strategies section of the Land Use Element includes the following goals, policies, and implementation measures that relate to the proposed project, as amended (Hayward 2002, Land Use Element):

1. Industrial Corridor (Business and Technology Corridor)[2]

Policy 7 of this section strives to promote the transition *[of the Industrial Corridor;* italics added] from a manufacturing-based economy to an information-based economy in the industrial areas. To effect this transition, Strategy 7(1) recommends the City consider adoption of multiple zoning districts within the Industrial Corridor that would provide for a concentration of similar types of uses, such as manufacturing, warehouse/ distribution, or research and development/offices. In addition, Strategy 7(2) recommends the City identify specific sites or opportunity areas for highly desirable uses that enhance the tax base.

The General Plan recommends consideration be given to division of the Industrial Corridor into multiple use-specific districts. As noted by the project owner in response to Data Request #64, no such district in the vicinity of the RCEC has been proposed or adopted, and Energy Commission staff knows of no formal action that has been taken to exclude the areas containing and surrounding the Russell City location from manufacturing uses similar to the proposed project. The newly proposed project site has a General Plan land use designation of Industrial Corridor and the proposed use is consistent with other uses currently permitted within that land use designation. Surrounding properties are used primarily for warehousing, and small wholesale, manufacturing, retail, and construction businesses, consistent with those identified in the RCEC FSA and 2002 Decision. The proposed project does not conflict with the goals expressed in Policy 7 or obstruct the implementation of Strategy 7(1) and is, therefore, consistent with this portion of the Hayward General Plan.

2. City Boundaries

The Hayward General Plan Policy 11 seeks to achieve more congruous boundaries to provide for the efficient delivery of public services and to create a greater sense of community. Strategy 11(1) recommends the City evaluate annexing unincorporated islands and adjoining urbanized county areas within the Sphere of Influence, in light of desires of affected residents and fiscal impacts on the City.

The recent annexation of the Depot Road Island (as part of the Mt. Eden Annexation Project, Phase 1) on March 5, 2007, is consistent with the directives of Policy 11 and Strategy 11(1). This isolated "island" of land was completely surrounded by lands within the City of Hayward jurisdiction. Annexation of lands within the Mt. Eden area has been an ongoing process to incorporate Alameda County lands into the surrounding City boundaries since the 1950s (Hayward 2004, pp. 5-6). The proposed project site, along with other surrounding properties within the Depot Road Island boundaries, were identified as being within the Hayward Sphere of Influence, with a land use designation of Industrial Corridor. This designation did not change following annexation.

3. Additional General Plan References

The project owner identified two additional General Plan Land Use policies that could be applicable to a project sited in the Industrial Corridor. As noted in the project owner's response to Data Request #64 (RCEC 2007c), the General Plan recommends the City

[2] References to the "Industrial Corridor" are used interchangeably with the "Business and Technology Corridor" throughout the 2002 Hayward General Plan. However, there is no evidence that this identification has been formally codified.

consider allowing uses, such as child care facilities, in the industrial zone, at locations "such as new business parks, where these facilities could…pose little or no safety risks." The General Plan also recommends that parking ratios be increased or that on-street parking be allowed to encourage more intensive office uses. Energy Commission staff concurs with the project owner's assertion that these policies are not applicable to the RCEC project.

The Economic Development Policies and Strategies section of the Economic Development Element includes the following goals, policies, and implementation measures that relate to the proposed project, as amended (Hayward 2002, Economic Development Element):

4. Land and Infrastructure

General Plan Policy 2 of the Economic Development element encourages the creation of a sound local economy that attracts investment, increases the tax base, creates employment opportunities for residents, and generates public revenues. Several strategies are suggested to accomplish this, including Strategy 2(3) which directs the City to ensure there is adequate infrastructure (electricity, water, sewer) to support existing and new development; Strategy 2(5) which recommends uses that would erode the integrity of the Business and Technology Corridor be limited; and Strategy 2(7), which directs the City to promote and protect the appearance of the Business and Technology Corridor to encourage quality development.

- The proposed project design ensures that there would be adequate infrastructure in place prior to the start of plant operations and is, therefore, consistent with Strategy 2(3).
- The proposed project site is not in close proximity to any area proposed or designated as the Business and Technology Corridor. However, although there is no area that has been officially designated as the Business and Technology Corridor, this designation is used almost interchangeably with the Industrial Corridor designation in the 2002 General Plan. The proposed project site has a General Plan land use designation of Industrial Corridor, which, by definition, is primarily devoted to industrial uses. As noted in Land Use Policy 7 and Strategy 7(1) above, the proposed use is consistent with other uses currently permitted within that land use designation. Additionally, the project proposes, and would be required by **Visual Resources** conditions of certification (see **Visual Resources** section of this document), to landscape the facility along roadways and areas visible to local residents and motorists to reduce the plant's visual impact and increase the visual compatibility with surrounding properties. Energy Commission staff has been unable to identify any project elements that would erode the integrity or appearance of the Industrial Corridor, and considers the proposed project consistent with Strategies 2(5) and 2(7).

The proposed project location is zoned Industrial, which is consistent with an Industrial Corridor General Plan land use designation. (See Section 10-1.1600 Industrial District below for further discussion of project consistency with the Industrial Zoning District designation.) The proposed project is also consistent with the applicable 2002 General Plan policies and strategies. Therefore, despite substantial revisions to the Hayward General Plan since the project's original certification, changes introduced as part of the

project owner's Petition to Amend would not render the project inconsistent with the goals and policies of the 2002 General Plan.

Municipal Code Chapter 10 – Planning, Zoning, and Subdivisions

Chapter 10 of the Hayward Municipal Code contains ordinances that deal with planning, zoning, and subdivision standards, requirements, and restrictions. Article 1 of this chapter, also known as the Hayward Zoning Ordinance, specifically provides regulations that implement the goals, objectives, and policies of the Hayward General Plan, pursuant to the mandated provisions of the State Planning and Zoning Law, CEQA, and other applicable state and local requirements [HMC(a)]. While the proposed project is subject to all applicable Hayward Municipal Code requirements, the sections of the Hayward Zoning Ordinance that apply specifically to the proposed project, as amended, are discussed below. Other City of Hayward code requirements are addressed in other technical sections of this Staff Assessment.

Section 10-1.135 Exceptions

This section of the Hayward Municipal Code exempts the following uses from provisions of the Zoning Ordinance and permits the uses in any district: poles, towers, wires, cables, conduits, vaults, laterals, pipes, mains, valves, or any other similar distributing and transmitting equipment for electric power, provided the installation conforms with applicable Federal Communications Commission (FCC), California Public Utilities Commission (CPUC), and Federal Aviation Administration (FAA) rules and regulations, or any other applicable LORS. Therefore, height restrictions, setbacks, and minimum design and performance standards do not apply to these aspects of the project design. It does not, however, exempt those project elements related to the generation of electricity, including stacks, from Industrial Zoning District requirements.

Section 10-1.140 Exclusionary Zoning Ordinance

As identified in this section of the Zoning Ordinance, any use that is not specifically listed as "Uses Permitted" within the parcel's zoning designation is prohibited unless it is determined by the Planning Director, or on appeal to the Planning Commission, that the use is similar to and not more objectionable or intensive than the uses listed as "Permitted." Power plants are not a permitted use within the Industrial District, but have been determined to be a use similar to a permitted use (manufacturing) and similar to other uses existing within the Industrial District (Hayward 2001e). However, although Hayward City Council Resolution #01-104 confirmed that power plants are a use similar to a permitted use (manufacturing) and similar to other uses existing in the Industrial Zoning District, it did not address the project's potential to create an aviation safety hazard in areas where the Industrial Zoning District and Airport Approach Zoning Plan area overlap. Hayward Municipal Code §10-1.140 (Exclusionary Zoning Ordinance) states that uses not specifically listed as "Uses Permitted" within a Zoning District are prohibited unless it can be determined the use is "…not more objectionable or intensive than the uses listed." The proposed project would generate thermal plumes that could jeopardize the safety of aircraft operating within the Hayward Executive Airport operational airspace (see Section 10-6 Airport Approach Zoning Regulations discussion below). Generation of thermal plumes that could result in a hazard to navigation is considered by Energy Commission staff to be more objectionable than other uses within the Industrial District that do not create a similar hazard. Therefore,

based on information available to date, siting of the project at the proposed location is inconsistent with §10-1.140.

Section 10.1-155 Prezoning or Interim Zoning of Unincorporated Lands

This section of the Hayward Municipal Code allows any unincorporated territory adjoining the City of Hayward to be prezoned or given an interim zoning classification for the purpose of determining the classification that will apply to such property in the event of annexation to the City of Hayward. The classification becomes effective when annexation becomes effective. This section did not apply to the original project site. Hayward City Council Ordinance #04-14 (adopted October 19, 2004) amended Hayward Municipal Code Chapter 10, Article 1 by prezoning those properties contained within the boundaries of the proposed Mt. Eden Annexation Project. The Depot Road Island, which includes the amended project site, was prezoned Industrial District, and became subject to the requirements and restrictions contained within §10-1.1600 upon annexation by the City of Hayward.

Section 10-1.1600 Industrial District (I)

The original project site was located within the City of Hayward Industrial District. All four of the parcels that constitute the proposed project site are also zoned Industrial and subject to the requirements of HMC Chapter 10, Article 1. This section of the Hayward Municipal Code identifies the uses allowed within the Industrial District, development standards and restrictions, and minimum design and performance standards for projects within this District. The same requirements apply to both the original and proposed sites, as addressed in the AFC Staff Assessment and Decision. Hayward Municipal Code §10-1.1600 has not been significantly changed since the original project assessment and certification.

The project was originally certified for construction at 3636 Enterprise Avenue in Hayward on September 11, 2002. As part of the original certification process, the Hayward City Council adopted Resolution #01-104 on July 10, 2001, which determined that the siting of the Russell City Energy Center at 3636 Enterprise Avenue was consistent with the General Plan and conformed with the Industrial Corridor land use designation (Hayward 2001e). In response to the requirements of Hayward Municipal Code §10-1.140, this resolution also established that power plants are a use similar to a permitted use (manufacturing) in the Industrial Zoning district and similar to other uses existing within the Industrial District at that time. On October 11, 2005, when relocation of the project was under initial discussion, the Hayward City Council adopted Resolution #05-125, supporting a proposed exchange of property between the project owner (Russell City Energy Center LLC) and the City and construction of the Russell City Energy Center on the new site (Hayward 2005). An additional resolution was adopted on May 23, 2006 (Resolution #06-068), amending the property exchange option addressed in the 2005 agreement (Hayward 2006). The City Council did not address consistency of the new site with the 2002 General Plan or current Municipal Code as part of the 2005 resolution and did not amend the original site-specific 2001 resolution (#01-104), other than to express its support for the development and construction of the Russell City Energy Center on the land described in Resolution #05-125.

As expressed in the City of Hayward Planning staff's report to the City Council in 2001 (Hayward 2001c) and Resolution #01-104, power plant operation fits under the primary

use classification of “manufacturing” in the Industrial Zone, in that the conversion of natural gas by mechanical equipment into electric power constitutes a form of manufacturing. Manufacturing uses within the Industrial Zoning District have not changed substantially since the project was originally certified. However, per Hayward Municipal Code §10-1.1620, certain uses are generally consistent with the purpose of a base zoning district, but have the potential to cause conflicts with neighboring land use and zoning. These normally require an administrative or conditional use permit from the City of Hayward Planning Department prior to being established within the Industrial District. These uses may also be subject to conditions of project approval that are necessary to reduce or eliminate potential environmental effects or protect the public health, safety and welfare [HMC(a), §10-1.3200]. The RCEC operation would utilize aqueous ammonia, a Group A hazardous material. Per HMC §10-1.1620(b)(1)(a), industrial uses that involve the production, storage, handling, or similar activities utilizing any amount of hazardous materials classified as Group A are only permitted in an Industrial Zoning District with a conditional use permit (CUP), approved by the Hayward Planning Commission.

The following findings would need to be made for approval of a conditional use permit, in compliance with Hayward Municipal Code §10-1.3225:

a. The proposed use is desirable for the public convenience or welfare.
b. The proposed use will not impair the character and integrity of the zoning district and surrounding area.
c. The proposed use will not be detrimental to the public health, safety, or general welfare.
d. The proposed use is in harmony with applicable City policies and the intent and purpose of the zoning district involved.

The City of Hayward, like all communities within the State of California, is dependent on adequate electrical power to provide for the needs of its citizens and support a strong local economy. While the electricity generated by the proposed power plant would not be solely dedicated to the immediate surrounding area, it would support the sustainability of the area’s power grid, contributing indirectly to public convenience and welfare.

The City of Hayward has expressed its support for the development and construction of the RCEC at the proposed location in City Council Resolution #05-125 (Hayward 2005), and Resolution #01-104 confirms that power plants are a use similar to a permitted use (manufacturing) in the Industrial Zoning district and other existing uses (Hayward 2001e). Additionally, in a letter from the Hayward Planning Manager (Hayward 2007c, p.2), the City indicated that, although the heights of the stacks would be significant and their visual and aesthetic impacts cannot be mitigated to an insignificant level, the RCEC facility would be in an area that already contains another facility with a stack of significant height (at the Rohm and Haas Chemical plant to the southeast) and is further away from areas visible from residential and public areas. Therefore, placement of the facility at the proposed location would not impair the character and integrity of the zoning district and surrounding area. The proposed project is also generally in harmony with the intent and purpose of the Industrial Zoning District, which supports development of industrial uses within this zoning district and strives to promote a

desirable and attractive working environment with a minimum of detriment to surrounding properties.

However, the project cooling towers and HRSG stacks generate thermal plumes that have the potential to adversely affect the maneuverability of aircraft within the Hayward Airport Approach Zoning Plan area, as discussed in the **Traffic And Transportation** Section of this Staff Assessment and in Section 10-6 Airport Approach Zoning Regulations below. The project is, therefore, inconsistent with HMC §§10-1.140 and §10-6.35 (see discussions in this analysis).

Upon consideration of the findings required to justify issuance of a CUP, Energy Commission staff has determined that all findings required could not be made and a conditional use permit normally could not be issued for the proposed project. Approval of the RCEC project, as amended, without meeting the requirements for a CUP, would be inconsistent with the HMC §10-1.1620(b)(1)(a) and §10-1.3225.

Parking

AFC Amendment §2.4.4 and Figure 2.4-1 (**PROJECT DESCRIPTION Figure 2)** identify three (3) locations outside of the primary site boundaries that would be used for temporary construction laydown and parking. These parcels, or portions of parcels, are zoned Industrial, but are not currently used for parking. According to City of Hayward Planning Manager, David Rizk (Hayward 2007e), temporary off-site construction parking would not require an administrative use permit, but would normally need a site plan review and would be subject to various conditions deemed reasonably necessary to achieve a beneficial effect, which may include but would not be limited to [HMC(a), §10-1.3130]:

- Site plan architectural requirements, such as building arrangement, safe and efficient access, adequate open spaces, landscaping, screening, parking and yards, shielded lighting, compatible signs, harmonious external building design, and sufficient variety to avoid monotony in external appearance.
- Restrictions on activities and equipment permitted.
- Restrictions on times when activities would be permitted.
- Specified time period within which approval is valid.
- Furnishing of guarantees assuring compliance with conditions.
- Adequate safeguards against the emission of dust, heat, glare, electromagnetic interference, odors, smoke and particulate matter, wastes, refuse, water pollution, and other environmental hazards and pollutants.

Use of adjacent properties for construction parking is convenient for the workers and alleviates the need to find a significant number of parking spaces in an area that is already impacted. Several surrounding businesses provide large parking areas and temporary parking lots are common during construction within the Industrial Corridor. Rather than having a detrimental effect on public health, safety, and general welfare, the convenience of parking areas that would not require workers to walk along crowded roads or increase existing parking congestion would help to mitigate the potential impact of a large influx of temporary workers. There is also no inconsistency with the use of undeveloped or underutilized property within the Industrial Zoning District for parking or

construction materials storage, as the proposed use is temporary and would not prevent or limit any existing or future permitted use.

Most of the conditions that would be required by the City of Hayward are already addressed in the Energy Commission's project requirements and conditions of certification, included in various sections of this Staff Assessment. In addition, staff's Condition of Certification **LAND-1** requires the project owner to submit the final project site plan to the City of Hayward, in sufficient time for review and comment, and to the Energy Commission Compliance Project Manager (CPM) for review and approval, prior to the start of construction. Full implementation of all project conditions of certification, including **LAND-1**, would make the off-site parking component of the proposed project, as amended, consistent with all applicable LORS and reduce any potential impacts to a less than significant level.

Section 10-3.2 Lot Line Adjustment Maps and Section 10-3.4 Merger of Contiguous Parcels Under Common Ownership

Condition of Certification **LAND-2**, as contained in the Decision, required the project owner to adjust the lot lines of the separate parcels into a single parcel under common ownership. The City of Hayward Subdivision Ordinance is adopted pursuant to the Subdivision Map Act (Government Code Title 7, Division 2) as a local ordinance that incorporated, by reference, all applicable provisions and is supplemental to all provisions therein. However, per Government Code §66412(d), the Subdivision Map Act does not apply to a lot line adjustment between four or fewer existing adjoining parcels, where the land taken from one parcel is added to an adjoining parcel, and where a greater number of parcels than originally existed is not thereby created, if the lot line adjustment is approved by the local agency, or advisory agency. Therefore, for these lot line adjustments and mergers of contiguous parcels under common ownership, only the applicable City of Hayward requirements apply [HMC(b), §§10-3.2, 10-3.4].

Although the general intent of the original **LAND-2** Condition of Certification remains unchanged, the change in location and site configuration proposed in the RCEC Amendment requires modification of **LAND-2** for the project to remain consistent with City of Hayward LORS.

Section 10-6 Airport Approach Zoning Regulations

Section 10-6 of the Hayward Municipal Code identifies the Airport Approach Zoning Plan (AAZP) area for the Hayward Executive Airport (formerly the Hayward Air Terminal). It also provides regulations to prevent the creation or establishment of airport hazards that may endanger the maneuvering of aircraft within the airport's operational airspace. These regulations are consistent with Chapter II(C) of the ALUPP, which identifies a Hazard Prevention Zone/General Referral Boundary (HPZ) for Hayward Executive Airport, and the proposed Airport Influence Area[3] (AIA) included in the draft Airport Land Use Compatibility Plan (revised ALUPP), which would

[3] Airport Influence Area: The area in which current or future airport-related noise, overflight, safety, and/or airspace protection factors may significantly affect land uses or necessitate restrictions on those uses. In most circumstances, the airport influence area is designated by the ALUC as its *Planning Area Boundary (previously General Referral Boundary)* for the airport and the two terms can be considered synonymous. (Caltrans 2002, Appendix I, p.I-1).

supersede the HPZ when adopted by the Alameda County Airport Land Use Commission. Properties within the AAZP, which extends approximately two miles out from the airport runways, and the HPZ, with irregular boundaries extending outward up to three miles from the airport, are subject to restrictions regarding land uses that could present a hazard to aircraft navigation. Hayward Municipal Code §10-6 codifies the ALUPP policies for Hayward Executive Airport. Although the proposed project site is outside the Airport Traffic Pattern Zone for the Hayward Airport (HWD 2002, Exhibit 5B), it is within the AAZP, HPZ, proposed AIA, and transitional airspace for this airport. The City of Hayward has indicated that, because the proposed RCEC site is outside the Traffic Pattern Zone (TPZ) for the Hayward airport and only a small percentage of aircraft (40±) overfly the site monthly, the proposed location is consistent with the City's application of HMC §10-6.35 (Hayward 2007g). However, the City did not address the location of the project site within the HPZ or the airport transition zone (portion of the airport operational airspace outside TPZ boundaries; HWD 2002, Airport Layout Plans – Airport Airspace, p.3 of 9), and the restrictions associated with these areas.

According to Hayward Municipal Code §10-6.35, "no use may be made of land within any airport approach zone, airport turning zone, or airport transition zone in such a manner as to…endanger the landing, takeoff, or maneuvering of aircraft." The Russell City facility would be a gas-fired power plant that would create thermal plumes above two (2) stacks and a series of cooling towers. Energy Commission staff have determined that thermal plumes may disturb atmospheric stability to more than 1,000 feet above ground level (AGL). (See the **Traffic And Transportation** Section of the Staff Assessment for a comprehensive discussion of potential aviation safety impacts.) While the conditions of certification proposed as part of the **Traffic And Transportation** analysis would reduce the potential for overflight of the project-generated thermal plumes, it would do nothing to reduce the plume's velocity or eliminate the possibility of accidental or inadvertent overflight of the plumes.

The FAA, in their Safety Risk Analysis, determined that, although the potential for risk is "…acceptably small,…intentional and/or inadvertent overflight of industrial plumes at low altitudes (less than 1,000 feet above) during high velocity operation of the facility *(producing the plume; italics added)* could possibly result in aircraft upset and a resultant incident or accident." The agency report also determined that low, close-in operations at small to medium size airports by general aviation aircraft, particularly aircraft under 12,500 pounds and those in the Light Sport Aircraft (LSA) category, would be of greatest potential concern [FAA(b), Section 4, bullet 3, p,15]. Over 80 percent of the air traffic at Hayward airport is single engine, general aviation aircraft (HWD 2002, Chapter 2). Aircraft currently fly over the proposed project site during normal airport operations, at altitudes below 1,000 feet above ground level (AGL), at an average rate of 40 or more times per month (HWD 2007). Although the normal airport pattern altitude is 600-800 feet MSL, the proposed project site is outside the Hayward airport traffic pattern. The minimum altitude for fixed wing aircraft outside the traffic pattern (and over the site) is 500 MSL, except during takeoff and landing; helicopters may fly lower [FAA(c)]. Recently adopted southern noise abatement departure and arrival patterns for helicopters (see **TRAFFIC & TRANSPORTATION Figure 3**) further increase the potential for low level overflight of these plumes.

The FAA is often cited as the primary regulatory agency for all aviation concerns. However, the FAA has no authority over off-airport land uses and, while the agency can

provide guidance regarding land use safety compatibility in the immediate vicinity of the runway, runway protection zones at each end of the runway, and navigable airspace, its safety criteria only apply to property controlled by the airport proprietor (Caltrans 2002, p.9-4). It is also essential to emphasize that FAA aeronautical studies are concerned only with physical airspace hazards, not with hazards to people and property on the ground. An FAA determination of "no hazard" says nothing about whether proposed construction is compatible with airport activity in terms of safety and noise.

Although there are no federal or state LORS in the United States that specifically address the compatibility of uses that produce thermal plumes with aviation operational safety, this issue has been addressed more comprehensively in other parts of the world. As noted in the **Traffic And Transportation** section of this SA, Australian aviation authorities have established that an exhaust plume with a vertical gust in excess of 4.3 meters per second may cause damage to an aircraft airframe or upset an aircraft when flying at low levels. This standard, per the Australian AC 139-05, has also been accepted by the FAA as "…a valid representation of hazardous exhaust velocities" [FAA(b), p.6). As a result, the Australian Department of Transport and Regional Services (DOTARS) has the authority to prohibit or limit the erection of a facility that would generate an exhaust plume with an average vertical velocity greater than 4.3 meters per second at the lower limit of the prescribed airspace (safety zone, airport influence area, or pattern altitude). Australian state governments incorporate CASA recommendations into planning policies and local government agencies are required to implement these policies through land use compatibility LORS. For example, the Queensland Department of Transport issued State Planning Policy 1/02, which indicates that development incorporating stacks or vents that would emit high velocity plumes (defined as a gaseous plume with a velocity exceeding 4.3 meters per second) would be inappropriate unless measures are included to prevent the plume from intruding into an airport's operational airspace (Queensland 2002; Section 4.6, p.8). This restriction has generally been incorporated into various local regulations or aerodrome master plans by identifying facilities that produce these plumes as an incompatible land use within an aerodrome's (airport's) Obstacle Limitation Surface (FAA equivalent = Navigable Airspace). HMC §10-6.35 is similar to these regulations in its intent to prevent the establishment of land uses that could jeopardize the safety of aircraft operating within the Hayward airport's airspace or result in a hazard to those living and working in the area in the event of an aircraft accident.

Based on information received to date, it appears that the Russell City project would generate thermal plumes that have the potential to endanger the maneuverability of aircraft within the Airport Approach Zoning Plan boundaries and would, therefore, be prohibited by Hayward Municipal Code §10-6.35. Section 10-6.45 does allow a property owner to request a variance from this Article's restrictions to erect a structure, increase the height of a structure, permit the growth of any tree, or otherwise use his property. However, according to David Rizk, Hayward Planning Manager (Hayward 2007d), the City has never granted a variance in recent years for a new land use that would pose a hazard to airport operations. Siting of such a use, as proposed in RCEC Amendment 1, at a location within the Hayward Executive Airport AAZP/HPZ area is, therefore, inconsistent with the policies expressed in ALUCP Chapter IIIC (p. 56) and codified in the Hayward Municipal Code §10-6.35.

An Environmental Impact Report (EIR) was prepared for the Mt. Eden Annexation Project by the City of Hayward as a program EIR to describe general impacts and mitigation measures associated with the proposed annexation, by the City of Hayward, of isolated portions of Alameda County located within the Hayward city limits. The Final EIR (FEIR), filed in August 2004, contains mitigation measures specific to the development of any land annexed as part of the Mt. Eden Annexation Project. As noted above, three of the parcels that constitute the proposed project site were within the Mt. Eden Annexation Project boundaries and were annexed by the City of Hayward on March 5, 2007. Although the development requirements and mitigation measures contained in the FEIR were not applicable to the original project site, they do apply to the site proposed in the RCEC Amendment 1. (Hayward 2004, Project Description)

Impact 4.3-4 (flooding) indicates that portions of the Mt. Eden Annexation areas lie within a 100-year flood hazard area and that new construction within the area could be subject to flood damage during severe storms. The EIR identifies this as a potentially significant impact, requiring mitigation. Mitigation Measure 4.3-4(c) requires that, for future development within the 100-year flood hazard area, future project owners shall apply to the City of Hayward for a Conditional Letter of Map Revision (CLOMR) to remove the project site from the FEMA Flood Insurance Rate Map 100-year flood hazard area. In accordance with Part 65 of the National Flood Insurance Program (NFIP), a CLOMR must be requested through the Chief Executive Officer for the City of Hayward because the community is responsible for the adoption of the revised flood hazard information into its floodplain management ordinances and regulations. (See NFIP discussion above and **SOIL AND WATER-7** for specific condition requirements.)

CONCLUSIONS AND RECOMMENDATIONS

- The original Application for Certification (AFC) Final Staff Assessment (FSA) determined the project would not physically disrupt or divide an established community or conflict with any applicable habitat conservation plan or natural community conservation plan. Changes proposed in the project owner's Petition to Amend are not expected to alter that assessment.
- Assessment of the project's potential to convert Prime or Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use or conflict with existing agricultural zoning or Williamson Act contracts was not discussed in the original project FSA or Decision. However, the proposed project site, pipeline and utility easements, and transmission corridor do not border on any agricultural properties and neither construction nor operational activities would result in any impacts to existing agricultural operations or future use, convert Farmland to non-agricultural use, or conflict with existing agricultural zoning or Williamson Act contracts.
- Compliance with **SOIL AND WATER-7** condition of certification would result in project consistency with both federal and local flood plain regulatory programs and City of Hayward land use requirements for development within a floodplain. It will also meet the mitigation requirements identified in the Mt. Eden Annexation Project Final Environmental Impact Report (FEIR).

- The proposed project location is zoned Industrial, which is consistent with the Industrial Corridor General Plan land use designation. The project is also consistent with the applicable 2002 General Plan policies and strategies. Therefore, despite substantial revisions to the Hayward General Plan since the project's original certification, changes introduced as part of the project owner's Petition to Amend would not render the project inconsistent with the goals and policies of the 2002 General Plan.
- Although the general intent of the original **LAND-2** Condition of Certification remains unchanged, **LAND-2** has been modified to address the change in location and site configuration proposed in the Russell City Energy Center (RCEC) Amendment and remain consistent with Hayward Municipal Code (HMC) §§10-3.2 and 10-3.4.
- Requirements and restrictions of the Hayward Zoning Ordinance, including Industrial Zoning District height restrictions, setbacks, and minimum design and performance standards, do not apply to the proposed electric power distribution and transmission equipment, per HMC §10-1.135, provided the installation conforms with applicable Federal Communications Commission (FCC), State Public Utilities Commission (PUC), and FAA rules and regulations, or any other applicable laws, ordinances, regulations, and standards (LORS).
- Power plant operation, as proposed in this Amendment, is consistent with the primary use classification of "manufacturing" in the Industrial Zone. However, RCEC operation would utilize Group A hazardous materials. Per HMC §10-1.1620(b)(1)(a), industrial uses that involve the production, storage, handling, or similar activities utilizing any amount of hazardous materials classified as Group A are only permitted in an Industrial Zoning District with a conditional use permit (CUP), approved by the Hayward Planning Commission. Energy Commission staff is unable to make the CUP-required findings that the proposed use would not be detrimental to the public health, safety, or general welfare or that the proposed use is in harmony with applicable City policies and the intent and purpose of the zoning district involved, due to the potential for the project to introduce an aviation safety hazard into the Hayward Executive Airport operational airspace. Approval of the RCEC project, as amended, without meeting the requirements for a CUP, would be inconsistent with the HMC §10-1.1620(b)(1)(a) and §10-1.3225.
- The use of off-site parcels within the Industrial Zoning District for temporary construction parking normally requires site plan review by the City of Hayward Planning Department and would be subject to various conditions deemed reasonably necessary to achieve a beneficial effect. Most of the conditions that would be required by the City of Hayward are already addressed in the Energy Commission's project requirements and conditions of certification, included in various sections of this Staff Assessment. In addition, staff's Condition of Certification **LAND-1** requires the project owner to submit the final project site plan to the City of Hayward in sufficient time to allow the City an opportunity to review and comment and to the Energy Commission Compliance Project Manager (CPM) for review and approval, prior to the start of construction. Full implementation of all project conditions of certification, including **LAND-1**, would make the off-site parking component of the proposed project, as amended, consistent with all applicable LORS and reduce any potential impacts to a less than significant level.

- Based on information received to date, it appears that the thermal plumes generated by the Russell City project have the potential to endanger the maneuverability of aircraft within the Hayward Airport Approach Zoning Plan boundaries, as defined in HMC §10-6.35, HPZ, proposed AIA, and transitional airspace for the Hayward Executive Airport. No variances for uses that would pose a hazard to aircraft safety or restrict operational airspace have been granted in recent years. Siting of such a use at a location that could adversely affect the Hayward Executive Airport operational airspace is, therefore, inconsistent with the policies expressed in ALUPP Chapter IIIC (p. 56) and codified in the Hayward Municipal Code §10-6.35.

  Additionally, generation of thermal plumes that could jeopardize the safety of aircraft operating within this airspace is considered by Energy Commission staff to be more objectionable than other uses within the Industrial District that do not create a similar hazard. Therefore, based on information available to date, siting of the project at the proposed location is inconsistent with HMC §10-1.140.

If the California Energy Commission elects to grant certification for this project, as amended, Energy Commission staff recommends modification of both original Land Use conditions, as indicated in the **Proposed Modifications to Conditions of Certification** included in this section of the Staff Assessment. However, in Energy Commission staff's opinion, based on information available at this time, implementation of these Conditions of Certification would not resolve the project's inconsistency with City of Hayward LORS.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

The conditions of certification below are modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of Petition to Amend submitted to the Energy Commission on November 17, 2006. New conditions or new language in existing conditions are shown with underlining. Deleted language is shown with strikeout.

LAND-1 The project owner shall ~~comply with the minimum design and performance standards for the Industrial (I) District set forth in the City of Hayward Zoning Ordinance (Section 10-1.1645).~~ ensure that the project and its associated facilities are in compliance with the City of Hayward's Industrial Zoning District, including the lot and yard requirements, height limits, and minimum design and performance standards, and other applicable municipal code requirements.

The project owner shall submit a development plan to the City of Hayward Planning Department in sufficient time to allow for a ministerial review of the project and its associated facilities for compliance with the jurisdiction's site development and permitting requirements and to provide comments to the project owner and Energy Commission's Compliance Project Manager (CPM). The development plan shall include all elements normally required for review and permitting of a similar project, including site plan, structural dimensions, design and exterior elevation(s), and proof of any required permits.

Verification: ~~At least 30 days prior to the start of construction of the RCEC project, the project owner shall submit written evidence to the Energy Commission Compliance~~

~~Project Manager (CPM) that the project conforms to all applicable design and performance standards for the Industrial (I) District set forth in the City of Hayward Zoning Ordinance (Section 10-1.1645). The submittal to the CPM shall include evidence of review by the City.~~

At least 90 calendar days prior to the start of construction, including any grading or site remediation on the power plant project site and its associated facilities, the project owner shall submit the proposed development plan to the City of Hayward Planning Department for review and comment and to the CPM for review and approval. The project owner shall also provide a copy of the transmittal letter to the City of Hayward.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from the local jurisdiction, along with any changes to the proposed development plan, to the CPM for review and approval.

LAND-2 The project owner shall adjust the boundaries of ~~lot lines between the two~~ all parcels or portions of parcels that constitute the RCEC and Zero Liquid Discharge Facility project sites as necessary to merge all properties into a single parcel, under single ownership, within the City of Hayward jurisdiction, ~~in order to establish the RCEC and AWT project sites~~ in accordance with provisions and procedures set forth in the City of Hayward's ~~subdivision ordinance~~ Municipal Code, Chapter 10 - Article 3 (Subdivision Ordinance).

Verification: At least 30 days prior to construction of the RCEC project, the project owner shall submit evidence to the Energy Commission Compliance Project Manager (CPM), indicating approval of the ~~lot line adjustment~~ merger by the City of Hayward. The submittal to the CPM shall include evidence of compliance with all conditions and requirements associated with the approval of the Certificate of Merger and/or Notice of Lot Line Adjustment by the City. If all parcels or portions of parcels are not owned by the project owner at the time of the merger, a separate deed shall be executed and recorded with the County recorder, as required by Municipal Code §§10-3.290. A copy of the recorded deed shall be submitted to the CPM, as part of the compliance package.

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ACALUC 2007 – Email from Cindy Horvath (Alameda County Airport Land Use Commission), regarding consistency of Alameda County Airport Land Use Policy (Compatibility) Plan with City of Hayward General Plan and Municipal Code and Hayward Executive Airport Master Plan; received on April 23, 2007.

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CEC 2007(a). Letter to City of Hayward Planning Manager, David Rizk from Paul Richens, Manager/CEC Sitings Environmental Office re Land Use Issues. Sent and docketed on March 16, 2007.

CEC 2007(b). Email to City of Hayward re Interpretation of Municipal Code §10-6, Facilities Siting/Environmental Office/Shaelyn Strattan; June 6, 2007.

CH2MHILL 2007. CH2MHILL/D.M. Davy (tn: 38948). Applicant's Responses to Staff Data Requests 1-52. Cover letter docketed, transmittal letter, and attached POS. 01/17/2007. Rec'd 01/17/2007.

FAA(a). Federal Aviation Regulation (FAR) Part 77, Federal Aviation Administration, Title 14, CFR Part 77, Objects Affecting Navigable Airspace, Edition 1-1-04.

FAA(b). Safety Study Report (DOT-FAA-AFS-420-06-1), *Safety Risk Analysis of Aircraft Overflight of Industrial Exhaust Plumes*; Federal Aviation Administration, Fight Procedure Standards Branch; Oklahoma City, OK; January 2006.

FAA(c). Code of Federal Regulations (CFR), Title 14, Part 91.119(c,d) – Minimum Safe Altitude: General; Federal Aviation Administration; as of July 27, 2004.

FEMA 2000. FEMA Map Service Center, FEMA Issued Flood Maps; FIRM 0600010180C, effective February 9, 2000; located on the FEMA website at: http://map1.msc.fema.gov/idms/IntraView.cgi?KEY=72362076&IFIT=1.

Hayward 2001a. Agenda Report from the Director of Community and Economic Development, The New Economy and Transformation of the Industrial Corridor; presented to the Planning Commission and City Council on February 27, 2001.

Hayward 2001b. Minutes of the City of Hayward Planning Commission Meeting for June 28, 2001, Item 1 – Request by Calpine/Betchel Joint Development re Consistency Determination.

Hayward 2001c. Agenda Report from the Director of Community and Economic Development, Determination that the Proposed Power Plant (Russell City Energy Center) at 3636 Enterprise Avenue is Consistent with the General Plan and the Industrial Zoning District Designation; presented to the Mayor and City Council on July 10, 2001.

Hayward 2001d. Minutes of the Hayward City Council Meeting for July 10, 2001, Agenda Item 2 – Determination of Russell City Energy Center Consistency with the Hayward General Plan and Zoning Ordinance.

Hayward 2001e. City Council Resolution Resolution #01-104, Resolution Finding the Russell City Energy Center Power Plant Use is Consistent with the General Plan and Zoning Ordinance; adopted July 10, 2001.

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Hayward 2004. Mt. Eden Annexation Project – Final Environmental Impact Report (FEIR), SCH #2003122009. City of Hayward; August 2004.

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Hayward 2007c. Letter from Planning Manager, David Rizk, responding to request for clarification of City's position on Land Use Issues; docketed on April 23, 2007.

Hayward 2007d. Email from Planning Manager, David Rizk, re use of variance for aviation safety hazard; May 16, 2007.

Hayward 2007e. Email from Planning Manager, David Rizk, to Eric Knight, CEC, re need for AUP for temp parking; May 22, 2007.

Hayward 2007f. Letter from Planning Manager, David Rizk, identifying standard considerations and conditions for use permit approval; May 25, 2007.

Hayward 2007g. Response from Hayward City Manager, Jesus Armas, re Application of HMC §10-6 to RCEC project; dated June 27, 2007; received by email and hard copy on June 28, 2007.

HMC(a). Zoning Ordinance, Chapter 10, Article 1; City of Hayward Municipal Code.

HMC(b). Subdivisions Ordinance, Chapter 10, Article 3; City of Hayward Municipal Code.

HMC(c). Airport Approach Zoning Regulations; Chapter 10, Article 6; City of Hayward Municipal Code; adopted on September 15, 1964.

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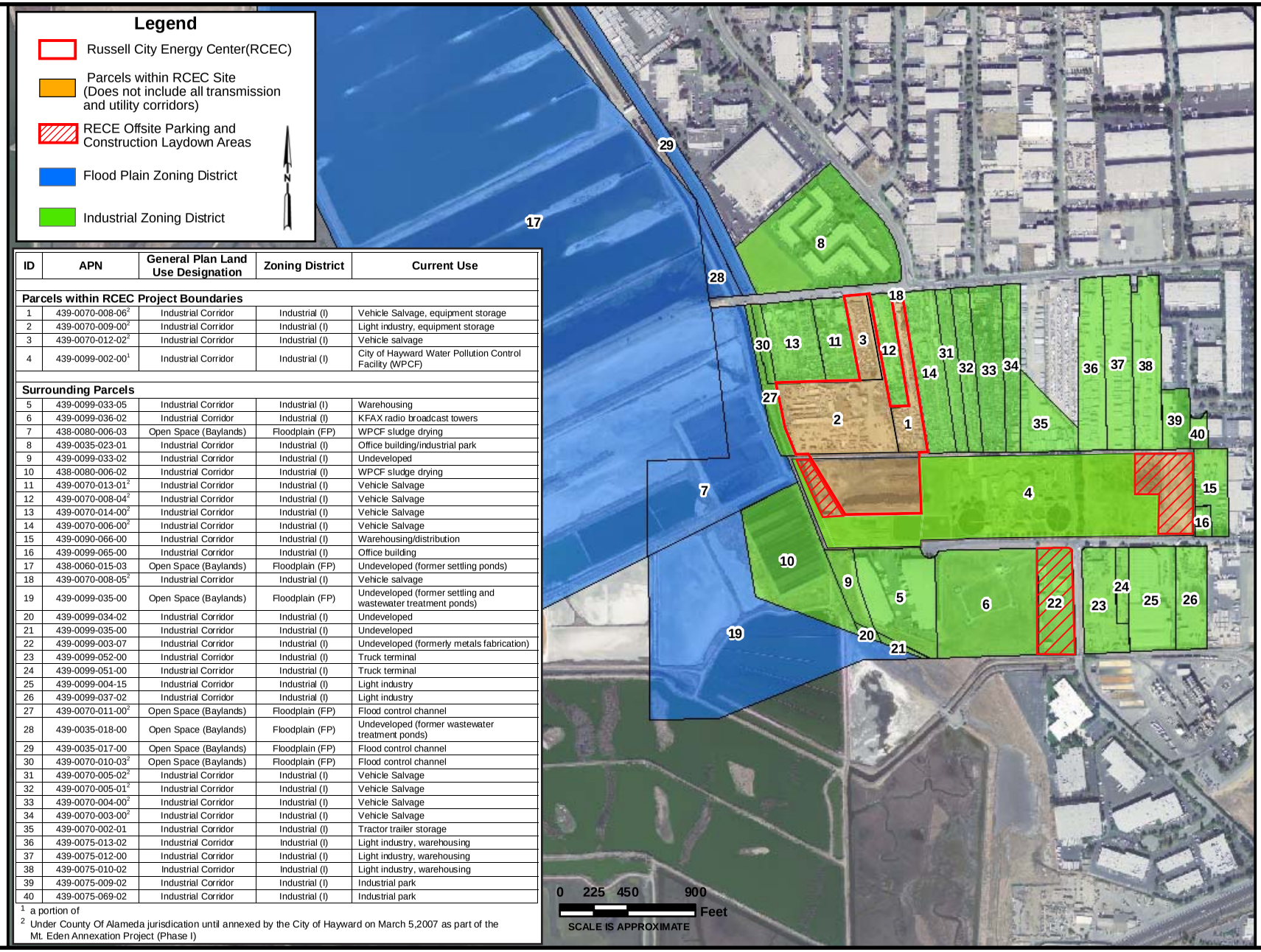
RCEC 2007b. Data Responses to Data Requests 53 and 54 docketed on March 2, 2007.

RCEC 2007c. Data Responses to Data Requests 66 to 72 docketed on April 17, 2007.

LAND USE - FIGURE 1

Russell City Energy Center Project - Project Site Boundaries, General Plan Land Use, Zoning District Designations and Current Use



ID	APN	General Plan Land Use Designation	Zoning District	Current Use
Parcels within RCEC Project Boundaries				
1	439-0070-008-06[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage, equipment storage
2	439-0070-009-00[2]	Industrial Corridor	Industrial (I)	Light industry, equipment storage
3	439-0070-012-02[2]	Industrial Corridor	Industrial (I)	Vehicle salvage
4	439-0099-002-00[1]	Industrial Corridor	Industrial (I)	City of Hayward Water Pollution Control Facility (WPCF)
Surrounding Parcels				
5	439-0099-033-05	Industrial Corridor	Industrial (I)	Warehousing
6	439-0099-036-02	Industrial Corridor	Industrial (I)	KFAX radio broadcast towers
7	438-0080-006-03	Open Space (Baylands)	Floodplain (FP)	WPCF sludge drying
8	439-0035-023-01	Industrial Corridor	Industrial (I)	Office building/industrial park
9	439-0099-033-02	Industrial Corridor	Industrial (I)	Undeveloped
10	438-0080-006-02	Industrial Corridor	Industrial (I)	WPCF sludge drying
11	439-0070-013-01[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage
12	439-0070-008-04[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage
13	439-0070-014-00[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage
14	439-0070-006-00[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage
15	439-0090-066-00	Industrial Corridor	Industrial (I)	Warehousing/distribution
16	439-0099-065-00	Industrial Corridor	Industrial (I)	Office building
17	438-0060-015-03	Open Space (Baylands)	Floodplain (FP)	Undeveloped (former settling ponds)
18	439-0070-008-05[2]	Industrial Corridor	Industrial (I)	Vehicle salvage
19	439-0099-035-00	Open Space (Baylands)	Floodplain (FP)	Undeveloped (former settling and wastewater treatment ponds)
20	439-0099-034-02	Industrial Corridor	Industrial (I)	Undeveloped
21	439-0099-035-00	Industrial Corridor	Industrial (I)	Undeveloped
22	439-0099-003-07	Industrial Corridor	Industrial (I)	Undeveloped (formerly metals fabrication)
23	439-0099-052-00	Industrial Corridor	Industrial (I)	Truck terminal
24	439-0099-051-00	Industrial Corridor	Industrial (I)	Truck terminal
25	439-0099-004-15	Industrial Corridor	Industrial (I)	Light industry
26	439-0099-037-02	Industrial Corridor	Industrial (I)	Light industry
27	439-0070-011-00[2]	Open Space (Baylands)	Floodplain (FP)	Flood control channel
28	439-0035-018-00	Open Space (Baylands)	Floodplain (FP)	Undeveloped (former wastewater treatment ponds)
29	439-0035-017-00	Open Space (Baylands)	Floodplain (FP)	Flood control channel
30	439-0070-010-03[2]	Open Space (Baylands)	Floodplain (FP)	Flood control channel
31	439-0070-005-02[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage
32	439-0070-005-01[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage
33	439-0070-004-00[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage
34	439-0070-003-00[2]	Industrial Corridor	Industrial (I)	Vehicle Salvage
35	439-0070-002-01	Industrial Corridor	Industrial (I)	Tractor trailer storage
36	439-0075-013-02	Industrial Corridor	Industrial (I)	Light industry, warehousing
37	439-0075-012-00	Industrial Corridor	Industrial (I)	Light industry, warehousing
38	439-0075-010-02	Industrial Corridor	Industrial (I)	Light industry, warehousing
39	439-0075-009-02	Industrial Corridor	Industrial (I)	Industrial park
40	439-0075-069-02	Industrial Corridor	Industrial (I)	Industrial park

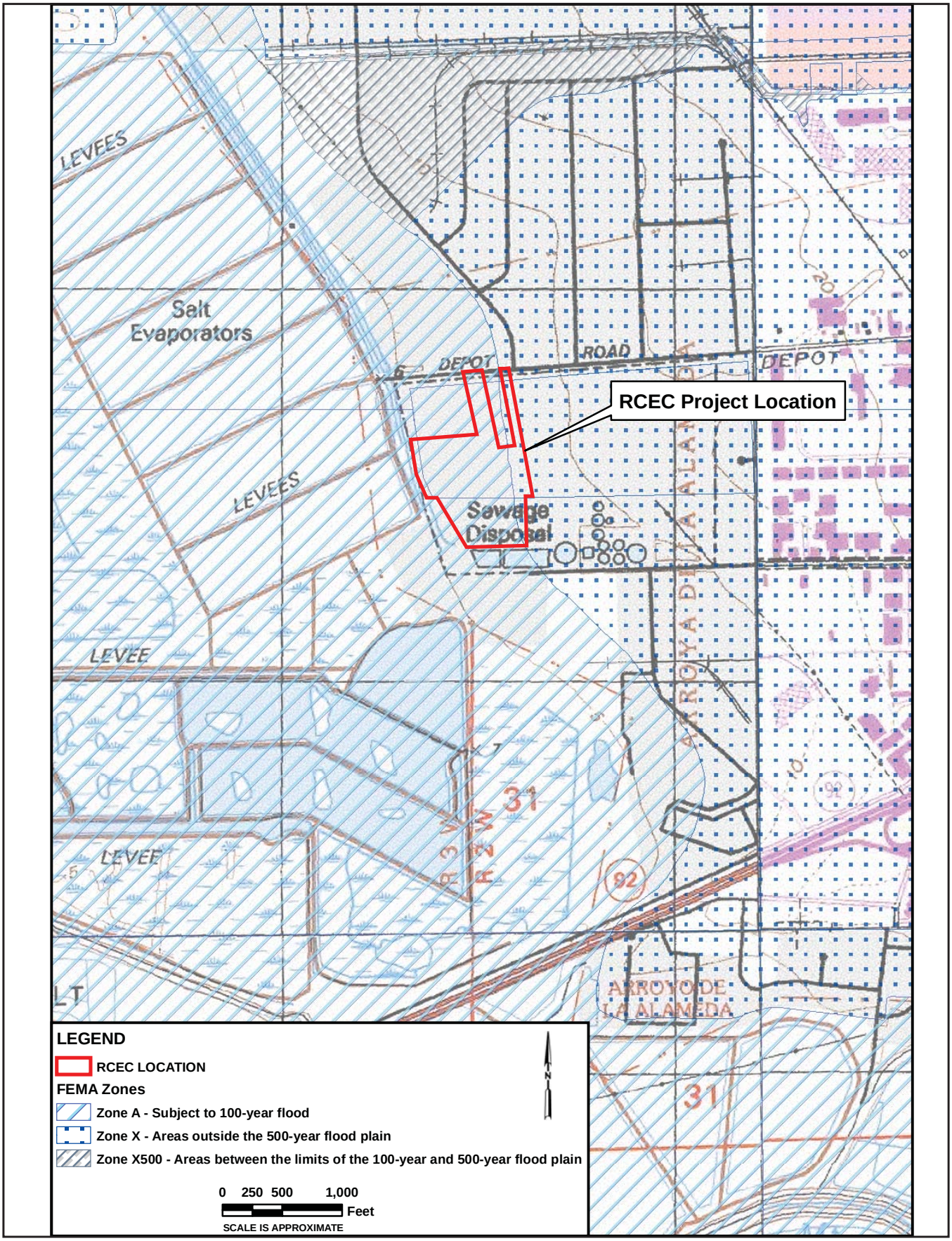
[1] a portion of
[2] Under County Of Alameda jurisdication until annexed by the City of Hayward on March 5,2007 as part of the Mt. Eden Annexation Project (Phase I)

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: RCEC Amendment #1; Figure DR29-1

LAND USE - Figure 2

Russell City Energy Center Project - FEMA Flood Zones in Vicinity of RECE Project Site

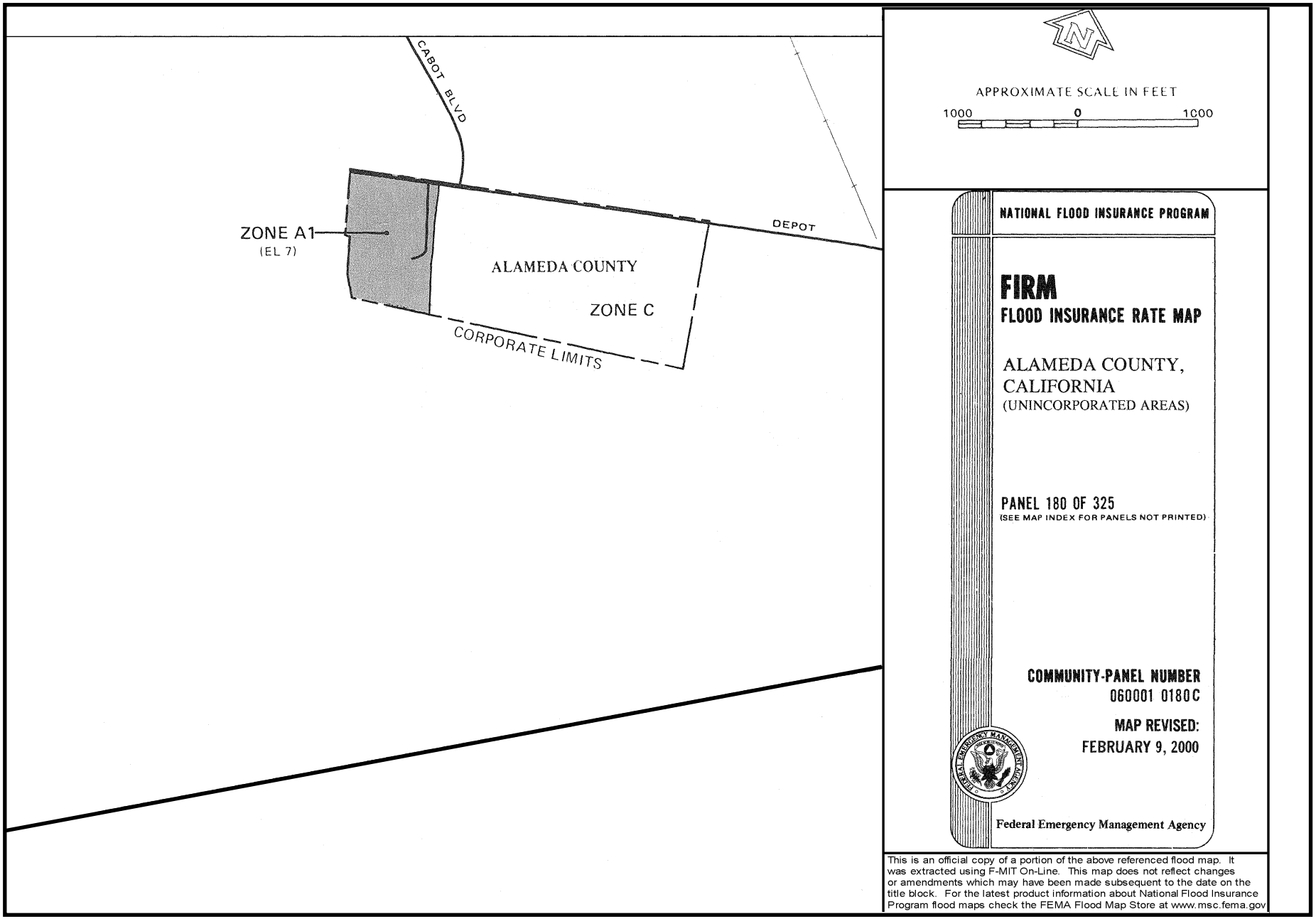


CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2007

SOURCE: RCEC Amendment #1; Figure 3.10-1 (FEMA Flood Zones)

LAND USE - FIGURE 3

Russell City Energy Center Project - FEMA Flood Zone A1 - Flood Designation for Project with Base Flood Elevation



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: FEMA Map Service Center, FEMA Issued Flood Maps; FIRM 0600010180c, effective February 9, 2000; located on the FEMA website

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 www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.)

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.

PUBLIC HEALTH

Testimony of Alvin J. Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

Staff concludes that the proposed Amendment to the Russell City Energy Center (RCEC) does not significantly change the analysis conducted for the original project in the area of Public Heath.

INTRODUCTION

This analysis focused only on changes to the original RCEC that may affect public health. The changes evaluated in this assessment include the relocation of the project site. The original analysis for Public Health can be found in the Final Staff Assessment (FSA) dated June 2002 (CEC 2002a).

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

The only new LORS affecting this project in the area of public health is Title 22, Section 60303, California Code of Regulations.

PUBLIC HEALTH Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	*Description*
State	
22 CCR 60303	Requires that, in order to protect workers and the public who may come into contact with cooling tower mists, chlorine or another biocide must be used to treat the cooling system water to minimize the growth of Legionella and other micro-organisms.

SETTING

The RCEC Amendment proposes to relocate the project site about 1,300 feet north and west, as well as rearrange the site plan and add a Zero Liquid Discharge (ZLD) system with the addition of a Title 22 recycling water facility to provide water for use on-site. Please refer to the **Project Description** section for more details.

The locations of sensitive receptors and residences relative to the project site have changed slightly as a result of the new location. The nearest residence is now 0.96 miles from the proposed site (as opposed to 0.82 miles previously) and other receptors are located within plus or minus 500 feet of the distances quoted in the original Application for Certification (AFC). The amendment states that there are no sensitive receptors immediately adjacent to the project site (RCEC Amendment Section 3.6.1 and Figure 3.1D-1) and staff concurs. The nearest sensitive receptor is located approximately 1.5 miles away.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The Public Health section of the staff assessment discusses toxic air contaminants (TACs) emitted from the project to which the public could be exposed during construction and routine operation. A health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) noncancer effects, and cancer risk (also long-term).

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called “reference exposure levels” or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects. These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic substance exposure. Staff assesses the significance of non-cancer health effects by calculating a “hazard index.” A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one signifies that the exposure is below the safe level.

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer but rather a theoretical upper-bound number based on worst-case assumptions. Staff uses a cancer risk level of ten in one million, or 10×10^{-6} as a level of significance, a level consistent with those of most state air quality management districts.

For a more complete discussion of the Methods and Threshold for Determining Significance, please refer to the Final Staff Assessment dated June 10, 2002 (CEC 2002a).

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

Staff evaluated the construction impacts assessment, which addressed emissions from diesel construction equipment, completed by the project owner and found it to be consistent with appropriate methodology. Therefore, staff was able to conclude that construction impacts have not changed significantly from the original AFC. However, impacts on worker safety and public health may be impacted by hazardous wastes present in the soil on the site and are described and addressed in the **Waste Management** section.

Operation Impacts and Mitigation

Staff was able to conduct a quantitative evaluation of the risk assessment results presented in the "Russell City Energy Center (01-AFC-07) Amendment 1" using the California Air Resources Board/Office of Environmental Health Hazard Assessment (CARB/OEHHA) Hotspots Analysis and Reporting Program (HARP model). Data input to the HARP model were obtained from the Amendment document and appendices.

The analysis conducted was a screening analysis of normal operations that involved the following:

- Use of project-specific stack parameters and emissions for two turbines/HRSGs, nine cooling tower cells, and the fire pump engine. Emission rates used were based on the scenario of annual averaging for normal operating conditions.

- Use of project-specific building parameters.

- Use of screening meteorology; no elevations were used.

- Use of a coarse receptor grid to 1200 m in all directions at 100 m increments.

- Exposure pathways assessed include inhalation, dermal absorption, soil ingestion and mother's milk.

For cancer risk calculations using the HARP model, staff used the "Derived (Adjusted) Method" and for chronic noncancer hazard calculations staff used the "Derived (OEHHA) Method".

The Maximally Impacted Receptor is that location off the site of the proposed power plant where the air dispersion model predicts the highest concentration of emitted pollutants would occur. This location is not necessarily a residence or a location where people actually exist; it is any off-site location on land where a person could potentially be present.

Staff assesses the significance of non-cancer health effects by calculating a "hazard index" (HI). A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level (the REL discussed above). A ratio of less than one signifies that the exposure is below the safe level. The hazard index for every toxic substance which has the same type of health effect is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels. Under these conditions, health protection from the project is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant non-cancer project-related public health impacts.

Staff determined that the maximum cancer risk would be approximately 4 in one million and that both the acute and chronic Hazard Indices would be less than 1.0 (0.11 and

0.057, respectively). A comparison of the results obtained by staff with the results presented in the Amendment is presented in **PUBLIC HEALTH Table 2.**

PUBLIC HEALTH Table 2
RCEC Project Owner and Staff Results

RCEC	***Maximally Impacted Receptor***		
	Project Owner	**Staff**	**Applicable Significance Threshold**
Cancer Risk	1.4E-06	4.1E-06	<= 10E-06 with T-BACT*
Chronic HI	0.0037	0.057	1.0
Acute HI	0.053	0.11	1.0
RCEC	***Maximally Impacted Worker***		
	Project Owner	**Staff**	**Applicable Significance Threshold**
Cancer Risk	2.2E-07	8.5E-07	<= 10E-06 with T-BACT
Chronic HI	0.00056	0.057	1.0
Acute HI	0.022	0.11	1.0

* The Bay Area Air Quality management District requires that all sources that emit TACs which result in a risk to the Maximally Impacted Receptor greater than one in one million be equipped with toxics best available control technology (T-BACT).

In conclusion, staff conducted an independent screening assessment of the risks and hazards reported in the Amendment using the facility data provided by the project owner. Modeling was conducted using the CARB/OEHHA Hotspots Analysis and Reporting Program (HARP), which was also used by the project owner. No significant differences in cancer risk, chronic hazard, or acute hazard were found in the staff analysis compared to the results reported by the project owner. Differences seen in **PUBLIC HEALTH Table 2** are most likely due to the differences in a screening analysis, as performed by staff, and a more refined analysis, as performed by the project owner.

COOLING TOWER

The possibility exists for bacterial growth to occur in the cooling tower water, including the growth of Legionella bacteria. Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of legionellosis, otherwise known as Legionnaires' Disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of legionellosis. Legionella can grow symbiotically with other bacteria and can infect protozoan hosts. This provides Legionella with protection from adverse environmental conditions, including making it more resistant to water treatment with chlorine, biocides, and other disinfectants. Thus, if not properly maintained, cooling water systems and their components can amplify and disseminate aerosols containing Legionella.

The State of California regulates recycled water for use in cooling towers in Title 22, Section 60303, California Code of Regulations. This section requires that, in order to protect workers and the public who may come into contact with cooling tower mists, chlorine or another biocide must be used to treat the cooling system water to minimize the growth of Legionella and other micro-organisms. This regulation applies to the RCEC since it intends to provide onsite treatment of recycled water to tertiary standards for cooling purposes. Legionella is not regulated by the Bay Area Air Quality Management District (BAAQMD) but the District suggests that facilities follow guidelines and recommendations made by the Cooling Technology Institute (CTI) in their February 2000 report titled "Legionellosis, Guideline: Best Practices for Control of Legionella" (CTI 2000).

The U.S. Environmental Protection Agency (EPA) published an extensive review of Legionella in a human health criteria document (EPA 1999). The U.S. EPA noted that Legionella may propagate in biofilms (collections of microorganisms surrounded by slime they secrete, attached to either inert or living surfaces) and that aerosol-generating systems such as cooling towers can aid in the transmission of Legionella from water to air. The U.S. EPA has inadequate quantitative data on the infectivity of Legionella in humans to prepare a dose-response evaluation. Therefore, sufficient information is not available to support a quantitative characterization of the threshold infective dose of Legionella. Consequently, the presence of even small numbers of Legionella bacteria is presumed to present a risk, however small, of disease in humans.

In 2000, as noted above, the CTI issued its own report and guidelines for the best practices for control of Legionella (CTI 2000). The CTI found that 40-60 percent of industrial cooling towers tested were found to contain Legionella. More recently, staff has received a 2005 report of testing in cooling towers in Australia that found the rate of Legionella presence in cooling tower waters to be extremely low, approximately three to six percent. The cooling towers all had implemented aggressive water treatment and biocide application programs similar to that required by proposed Condition of Certification **PUBLIC HEALTH-1**.

To minimize the risk from Legionella, the CTI noted that consensus recommendations included minimization of water stagnation, minimization of process leads into the cooling system that provide nutrients for bacteria, maintenance of overall system cleanliness, the application of scale and corrosion inhibitors as appropriate, the use of high-efficiency mist eliminators on cooling towers, and the overall general control of microbiological populations.

Good preventive maintenance is very important in the efficient operation of cooling towers and other evaporative equipment (ASHRAE 1998). Preventive maintenance includes having effective drift eliminators, periodically cleaning the system if appropriate, maintaining mechanical components in working order, and maintaining an effective water treatment program with appropriate biocide concentrations. Staff notes that most water treatment programs are designed to minimize scale, corrosion, and biofouling and not to control Legionella.

The efficacy of any biocide in ensuring that bacterial, and in particular Legionella growth, is kept to a minimum is contingent upon a number of factors including but not

limited to proper dosage amounts, appropriate application procedures and effective monitoring.

In order to ensure that Legionella growth is kept to a minimum, thereby protecting both nearby workers as well as members of the public, staff has proposed Condition of Certification **PUBLIC HEALTH-1**. The condition would require the project owner to prepare and implement a biocide and anti-biofilm agent monitoring program to ensure that proper levels of biocide and other agents are maintained within the cooling tower water at all times, that periodic measurements of Legionella levels are conducted, and that periodic cleaning is conducted to remove bio-film buildup. Staff believes that with the use of an aggressive antibacterial program coupled with routine monitoring and biofilm removal, the chances of Legionella growing and dispersing would be reduced to an insignificant level.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative risks of the proposed facility and existing emissions sources were not quantitatively evaluated in the Amendment or by staff. However, staff has qualitatively addressed cumulative impacts for this project and has quantitatively addressed them for another project in the recent past.

The maximum cancer risk for emissions from the RCEC (calculated by staff) is 4.1 in one million. (The project owner calculated a maximum risk of 1.4 in a million.) The maximum impact location occurs where pollutant concentrations from the RCEC would theoretically be the highest. Even at this location, staff does not expect any significant change in lifetime risk to any person, and the increase does not represent any real contribution to the average lifetime cancer incidence rate due to all causes (environmental as well as life-style and genetic). Project-related risks at residential locations which are more distant were found to be even lower, and actual risks are expected to be much lower still, since worst-case estimates are based on conservative assumptions and thus overstate the true magnitude of the risk expected. Therefore, staff does not consider the incremental impact of the additional risk posed by the RCEC to be individually significant. The worst-case long-term noncancer health impact from the RCEC (0.057 hazard index) is well below the significance level of 1.0 at the location of maximum impact. At this level, staff does not expect any noncancer health impacts to be the result of emissions from the proposed power plant. As with cancer risk, long-term hazard would be lower at all other locations.

The BAAQMD has in the past examined the issue of cumulative impacts from facilities affecting the same neighborhood. The BAAQMD concluded that elevated concentrations of toxic air contaminants from stationary sources tend to be quite localized and that cumulative risks are likely to occur only when multiple facilities with substantially low-elevation emissions are immediately adjacent to, or very close to, one another (BAAQMD 1993).

The proposed RCEC would be located about one-half mile away from the proposed Eastshore Energy Center and thus staff examined the potential impact of both power plants operating. Staff recently (2006) assessed a similar situation in San Francisco where a proposed power plant would be located less than ½-mile from an existing plant.

Staff conducted a detailed public health cumulative risk assessment of emissions of toxic air contaminants from the power plants and other facilities located in the vicinity of the proposed power plant. Twenty (20) facilities were included in the analysis: three power plants, one water treatment control plant, three dry cleaners, ten gasoline dispensing service stations, a steel drum facility, a printing facility and SF Petroleum. A total of 50 sources were evaluated using CARB's Hot Spots Analysis and Reporting Program (HARP). The results showed that the emission from the proposed power plant did not add to a significant cumulative cancer or noncancer impact. Based upon that assessment, staff would expect that if the same quantitative assessment was conducted for the RCEC, the results would be the same and that no significant cumulative impact on public health would exist.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

None received.

CONCLUSIONS

Staff concludes that the proposed RCEC amendment does not significantly change the analysis conducted for the original project in the area of public health. However, since the certification of this project in 2002, staff has developed a standard condition of certification that addresses the risk of impacts to public health as a result of bacterial contamination of cooling tower water. Therefore, the mitigation measure proposed by staff is sufficient to reduce impacts to public health to insignificant.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

PUBLIC HEALTH-1 The project owner shall develop, implement, and submit to the CPM for review and approval a Cooling Water Management Plan to ensure that the potential for bacterial growth in cooling water is kept to a minimum. The Plan shall be consistent with either staff's "Cooling Water Management Program Guidelines" or with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines but in either case, the Plan must include sampling and testing for the presence of Legionella bacteria at least every six months. After two years of power plant operations, the project owner may ask the Compliance Project Manager (CPM) to re-evaluate and revise the Legionella bacteria testing requirement.

Verification: At least 60 days prior to the commencement of cooling tower operations, the Cooling Water Management Plan shall be provided to the CPM for review and approval.

REFERENCES

American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) 1998. Legionellosis: Position Paper. June 25.

Bay Area Air Quality Management District (BAAQMD) 1993. Cumulative Air Toxics Modeling Study. Staff Report. July.

California Energy Commission (tn: 26086). (CEC 2002a) – Final Staff Assessment, June 2002.

Cooling Technology Institute (CTI). 2000. Guidelines: Best Practices for Control of Legionella.

Environmental Protection Agency (EPA) November 1999. (EPA-822-R-99-001) "Legionella: Human Health Criteria Document."

SOCIOECONOMIC RESOURCES

Testimony of Amanda Stennick

SUMMARY OF CONCLUSIONS

The modification of the Russell City Energy Center (RCEC) will have a minor effect on socioeconomics. Since the project was certified in 2002, the sales tax rate and the overall capital costs for the project have increased, which means that revenues and spending generated by the project will be greater than what was originally estimated. The number of construction jobs has increased slightly but will not cause a significant net change to the local economy. The number of operation jobs will remain the same and will not cause a significant net change to the local economy.

In March 2007, the Alameda County Local Annexation Formation Commission (LAFCO) annexed the portion of the site that was in Alameda County to the City of Hayward and the proposed site is now located entirely in the City of Hayward. The annexation will not adversely impact the distribution of the project's economic benefits within the local economy. Please refer to the **Land Use** section of this document for a discussion of the annexation.

INTRODUCTION

This analysis covers only those aspects of the RCEC that have changed as a result of the proposed amendment and that affect staff's testimony for **Socioeconomic Resources** as contained in the Commission Decision (Decision) dated September 11, 2002. The project changes that have been analyzed are the number of project construction workers and the impacts to the local economy resulting from the increased capital cost of the project and the change in the Alameda County sales tax rate.

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS)-COMPLIANCE

There are no changes to LORS as a result of the RCEC modification. Please refer to the 2002 Final Staff Assessment (FSA) for the list of **Socioeconomic LORS** (www.energy.ca.gov/sitingcases/russellcity/documents/2002-06-10_FSA.PDF).

SETTING

The new RCEC project site is located about 1,300 feet north of the previously proposed site and is located entirely within the City of Hayward. **SOCIOECONOMIC Figures 1 and 2** for the proposed RCEC location are the same as described in the FSA and Decision for the original project location.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

There are no changes to the method and/or threshold for determining significance for **Socioeconomic Resources**.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

SOCIOECONOMICS Table 1 is an update of the 2002 labor force for the project. The 2002 analysis showed the construction workforce would average 277 workers during the construction period and would peak at 485 workers. The RCEC amendment estimates that the construction workforce would average 324 workers during the 24-month construction period and would peak at 650 workers in month 14 (estimated at May 2009). Based on the updated labor force in the Oakland-Fremont-Hayward Metropolitan Division and the construction worker requirements in the RCEC amendment, the average number of workers required for project construction represents less than one percent of the total number of workers in **SOCIOECONOMICS Table 1**. Based on the small increase in the average number of workers by month, staff does not expect any adverse impacts to the area's schools, housing, law enforcement, emergency services, hospitals, or utilities. No new mitigation is proposed.

SOCIOECONOMICS Table 1
Available Labor by Skill in Oakland-Fremont-Hayward Metropolitan Division

Occupational Title	2008 Annual Averages
Cement Masons/Concrete Finishers	1,240
Carpenters	12,290
Helpers, Construction Trades	2,320
Electricians	5,220
Laborers	13,430
Operating Engineers	3,510
Engineering Technicians	4,620
Painters	4,030
Plumbers/Pipefitters/Steamfitters	3,290
Sheetmetal Workers	1,560
Administrative Service Managers	2,400
Truck and Tractor Operators	5,190
Welders/Cutters/Solderers/Brazers	3,510
Mechanical Engineers	1,850
Electrical Engineers	1,650
Plant and System Operators	3,850
Total:	**69,960**

The RCEC amendment estimates the total construction cost of the project to be $600 million, of which $74.7 million will be paid out as wages and salaries, including benefits. Local products subject to county taxes will be purchased during the construction process. The RCEC amendment states that about $12 million of total local product purchases would be taxed during project construction. The sales tax rate in Alameda County is 8.75 percent (as of July 1, 2006). The total tax revenue from the sale of local products during the two-year construction period would be about $1,050,000. The 2001 Application for Certification estimated that sales tax revenue to the City and County would range from $412,500 to $825,000, based on $5 to $10 million of products purchased locally during construction.

Operation Impacts and Mitigation

Property taxes are levied and collected annually by Alameda County at a rate of 1.0294 percent of the property value. The RCEC amendment estimates the total construction cost of the project to be $600 million. Based on this figure, total property tax is estimated at $6.17 million annually, which is an increase of the total property tax range of $3.47 million to $4.63 million in the 2002 analysis.

The number of operation jobs will remain the same and will not cause a significant net change to the local economy.

SOCIOECONOMICS Table 2 shows the change in labor, revenues, and taxes from the 2001 AFC to the 2006 RCEC Amendment. Total regional income is calculated through the use of an economic multiplier on project costs and wages. The 2001 AFC stated that based on the construction costs of $300 to $400 million, the benefits to the region would total an estimated $92 million. The 2007 amendment states that the project construction costs would now total an estimated $600 million. The 2007 estimated total regional income was not calculated by the project owner and therefore, will not be available for this analysis (Davy 2007). Staff will assume, based on the $600 million construction costs that the 2007 total regional income would exceed that of 2001.

SOCIOECONOMICS Table 2
Noted Project Changes: 2001 to 2006

	2001 AFC	2006 Amendment
Project Labor Peak	485 persons	650 persons
Project Labor Monthly Average	277 persons	324 persons
Project Costs	$300-$400 million	$600 million
Wages and Salaries	$58.2 million	$74.7 million
Sales Tax During Construction	$412,000-$825,000	$1,050,000
Annual Property Tax	$3.47-$4.63 million	$6.17 million
Total Regional Income	$92 million	Not available
Source: RCEC 2001 AFC and 2006 RCEC Amendment		

CUMULATIVE IMPACTS AND MITIGATION

The 2002 FSA stated that the proposed project would not result in any significant adverse socioeconomic impacts on population, housing and public services and would

not contribute to cumulative socioeconomic impacts in the South Bay or San Francisco Bay Area.

In addition to the RCEC, other projects planned in Alameda County are:

- the Eastshore Energy Center (EEC) (06-AFC-6), a 115.5 MW peaking plant; and
- the Interstate 880/State Route 92 Interchange Reconstruction Project in the City of Hayward.

Project construction for the EEC is expected to occur from March 2008 through September 2009 (a total of 18 months) and is expected to peak at 235 workers in February 2009 (month 11). Project construction for the RCEC is expected to occur from March 2008 through March 2010 (a total of 24 months) and is expected to peak at 650 workers in May 2009 (month 14). The potential cumulative impact would be the overlap of construction periods for both projects, or the entire 18-month EEC construction period. However, the combined peak workforce of both project totals 885 workers, which represents about 1.2 percent of the 2008 average annual Oakland-Fremont-Hayward MSA construction workforce. Therefore, staff does not expect the RCEC by itself or cumulatively with the EEC to contribute to a significant cumulative socioeconomic impact.

Project construction for the Interstate 880/State Route 92 Interchange is expected to start in June 2007 and end in June 2011. The construction labor force for the road construction project would not be similar to that of a construction labor force for a power plant. Many labor crafts such as engineers, electricians, plumbers, pipefitters, and steamfitters would be in demand for power plant construction and not for road construction. While there is a potential for overlap in the construction categories of truck and tractor operators, laborers, construction equipment operators, and cement masons and concrete finishers, the 2008 average annual Oakland-Fremont-Hayward MSA construction workforce of 69,960 (**SOCIOECONOMICS Table 1**) is large enough to accommodate all three projects.

Because of the large labor force in the Oakland-Fremont-Hayward MSA, the amended project by itself or when combined with other projects would not contribute to significant adverse cumulative socioeconomic impacts. No additional mitigation is necessary.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

There are no agency or public comments in the area of **SOCIOECONOMIC RESOURCES** resulting from the proposed amendment.

CONCLUSIONS

The proposed amendment would not induce significant adverse impacts to the area's schools, housing, law enforcement, emergency services, hospitals, or utilities. Project benefits include increases in the local economy from wages, taxes, and local spending. No new mitigation is proposed.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

No new conditions of certification have been proposed as a result of project changes proposed by the project owner as part of the Petition to Amend submitted to the Energy Commission on November 17, 2006. Please note that since the June 2002 FSA, staff no longer proposes the socioeconomic condition (**SOCIO-1**) that requires the project owner and its contractors and subcontractors to recruit employees and procure materials and supplies locally. Staff has found that this condition creates additional work for staff and the project owner and yields very little useful information. Therefore, staff has omitted it from the 2007 amendment socioeconomic analysis. Because there is no filing of an in-lieu building permit, staff is revising the **SOCIO-2** condition. Strikeout is used to indicate deleted language and new language is underlined.

~~**SOCIO-1** The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within Alameda County unless:~~

- ~~To do so will violate federal and/or state statutes;~~
- ~~The materials and/or supplies are not available;~~
- ~~Qualified employees for specific jobs or positions are not available; or~~
- ~~There is a reasonable basis to hire someone for a specific position from outside the local area.~~

~~**Verification**: At least 60 days prior to the start of demolition, the project owner shall submit to the CPM copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months.~~

SOCIO-2 The project owner shall pay the one-time statutory school facility development fee to the Hayward Unified School District as required by Education Code Section 17620. ~~at the time of filing for the in-lieu building permit with the City of Hayward Building Department~~.

Verification: At least 30 days prior to the start of project construction, the ~~The~~ project owner shall provide proof of payment of the statutory development fee. ~~in the next Monthly Compliance Report following the payment.~~

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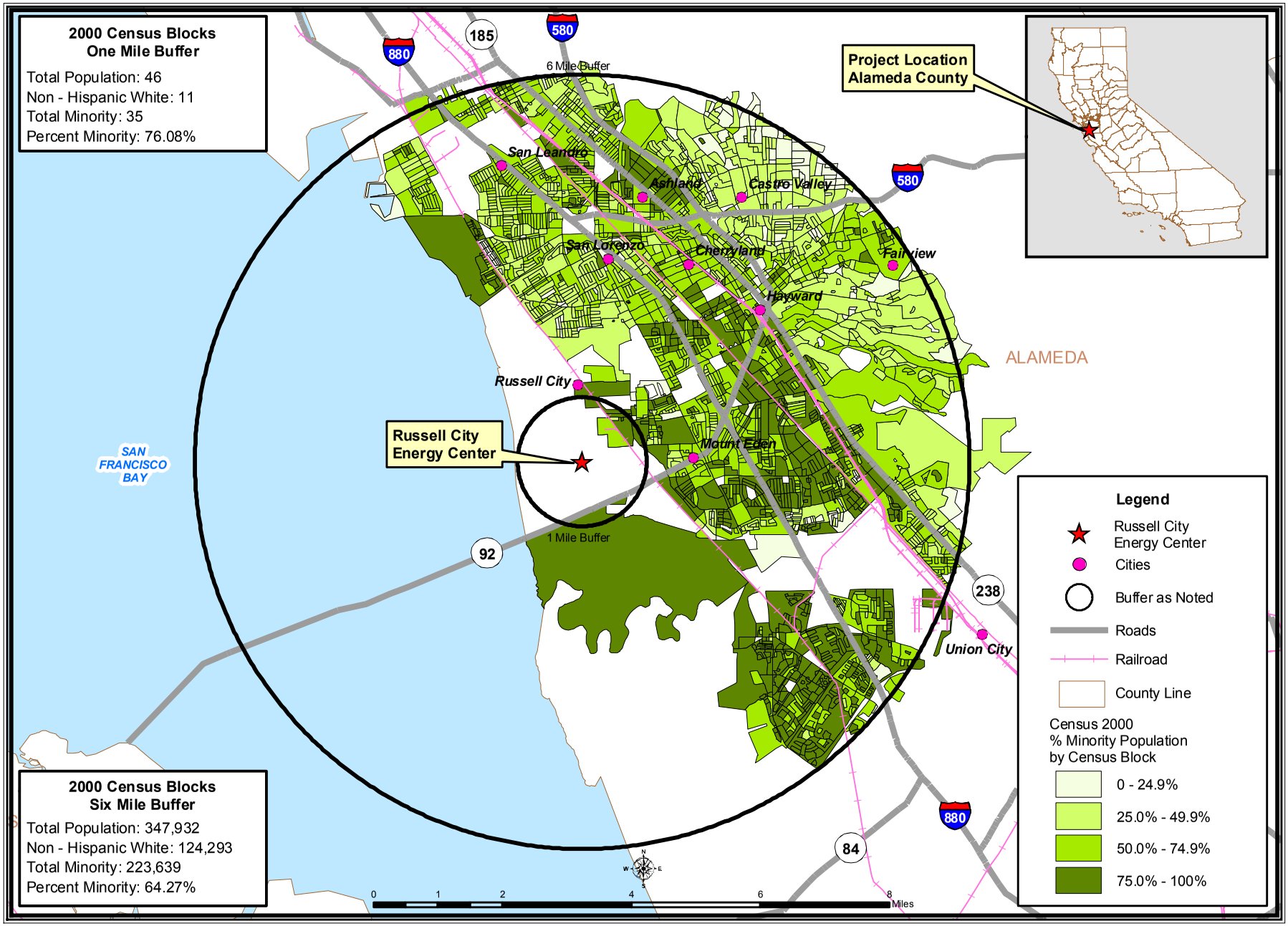
U.S. Census 2000. U.S. Census Data, 2000 Census. Profile of General Demographic Characteristics: 2000.

SOCIOECONOMICS - FIGURE 1

Russell City Energy Center Project - Census 2000 Minority Population by Census Block - One and Six Mile Buffer



JANUARY 2007

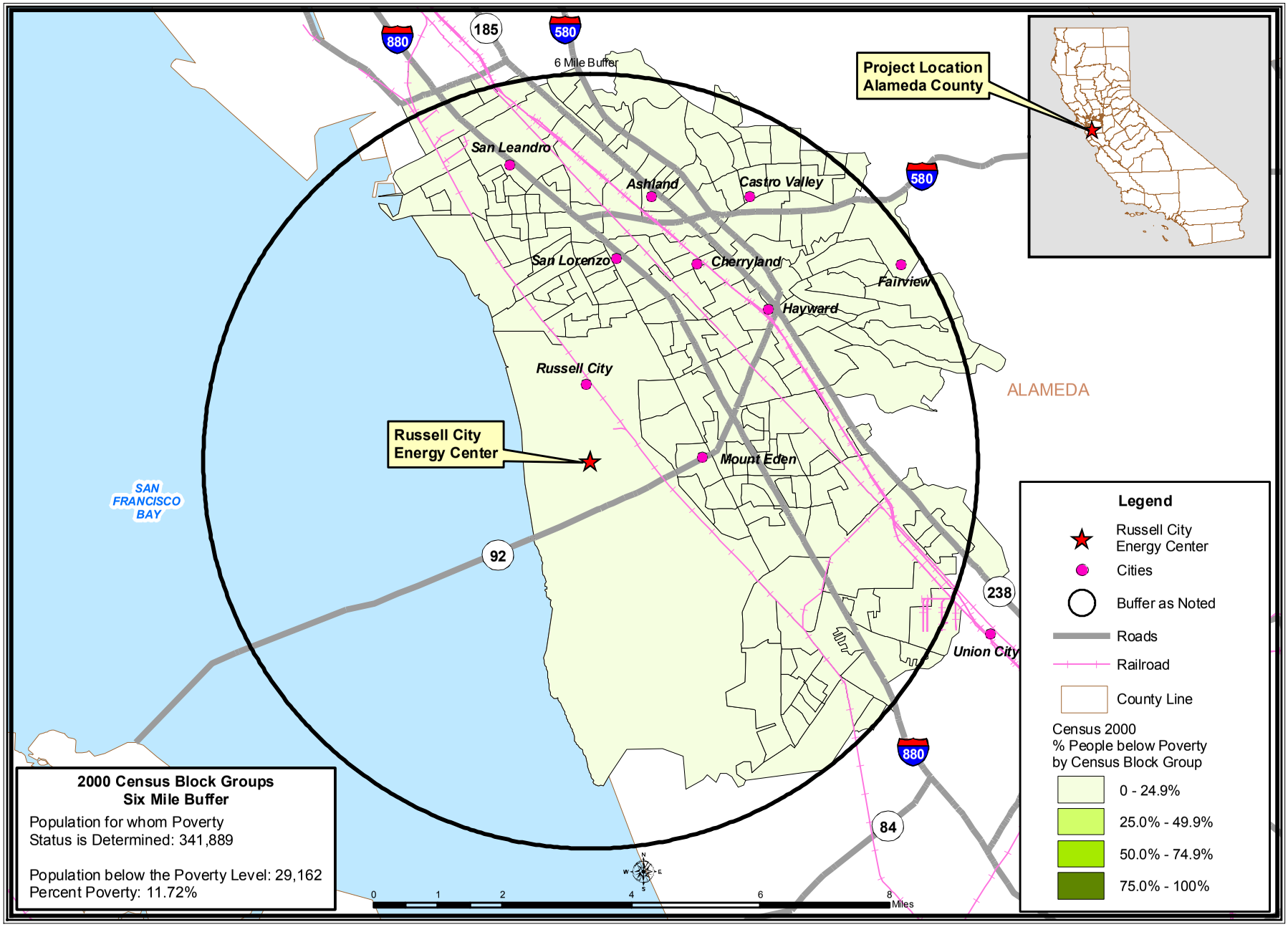
SOCIOECONOMICS

CALIFORNIA ENERGY COMMISSION, ENERGY FACILITIES SITING DIVISION, JANUARY 2007

SOURCE: California Energy Commission Statewide Power Plant Maps 2007 - Census 2000 PL 94-171 Data - Matrix PL2

SOCIOECONOMICS - FIGURE 2

Russell City Energy Center Project - Census 2000 Percentage of People below Poverty by Census Block Group - Six Mile Buffer



CALIFORNIA ENERGY COMMISSION, ENERGY FACILITIES SITING DIVISION, JANUARY 2007

SOURCE: California Energy Commission Statewide Power Plant Maps 2007 - Census 2000 - SF3

SOIL AND WATER RESOURCES

Testimony of Richard Latteri

SUMMARY OF CONCLUSIONS

There would be no unmitigated impacts to soil and water resources from the proposed project changes in Amendment No. 1 for the Russell City Energy Center (RCEC). Staff have not identified any unmitigated significant impacts to soil and water resources provided all proposed amendments to the conditions of certification are implemented. Staff recommends changes to Conditions of Certification **SOIL & WATER 1, 2, 3, 4, 6 & 8** and added Condition of Certification **SOIL & WATER-9**.

INTRODUCTION

On November 17, 2006, the Russell City Energy Company, LLC (project owner) filed a petition with the California Energy Commission to modify the RCEC project. The petition contains several modifications, the most notable being the relocation of the project facilities approximately 1,300 feet northwest of the original location in the City of Hayward (City). All proposed modifications are described in the **Project Description** Section of this document.

This analysis addresses project changes that would potentially impact soil and water resources through the construction and operation of the RCEC at its new location. Only those aspects of the RCEC project that have changed because of the proposed amendment and affect staff's testimony for Soil and Water Resources, as contained in the Commission Decision (Decision) dated September 11, 2002 (CEC 2002b), are examined. Identification and removal of contaminated soil is more fully discussed in the **Waste Management** Section to be included in Part 2 of this Staff Assessment.

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS) - COMPLIANCE

SOIL AND WATER Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Federal LORS	
Clean Water Act (33 U.S.C. Section 1257 et seq.)	The Clean Water Act (33 USC § 1257 et seq.) requires states to set standards to protect water quality, that includes regulation of stormwater discharges during construction and operation of a facility.
Resource Conservation and Recovery Act	The Resource Conservation and Recovery Act (RCRA) of 1976 (40 CFR Part 260 et seq.) seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
State LORS	
Water Code Section 13260	Requires filing with the appropriate Regional Board (RB) a report of waste discharge for the protection to waters of the state, unless the requirement is waived pursuant to Water Code section 13269.

Water Code Section 13551	Requires the water resources of the state be put to beneficial use to the fullest extent they are capable, and the waste or unreasonable use or unreasonable method of use be prevented.
Local LORS	
Hayward Municipal Code, Chapter 11, Article 2	Hayward Municipal Water System Ordinance that establishes requirements for permit application and approval for obtaining potable water from the City.
Hayward Municipal Code, Chapter 11, Article 3	Hayward Sanitary Sewer System Ordinance that establishes requirements for permit application and approval for obtaining Sanitary Sewer service from the City.
Hayward Municipal Code, Chapter 11, Article 5	Hayward Stormwater Management and Urban Runoff Control Ordinance that establishes consistency with the requirements of the Federal Clean Water Act and National Pollutant Discharge Elimination System (NPDES) Permit CAS0029831.
State Policies and Guidance	
California Constitution, Article X, Section 2	This section requires the water resources of the state be put to beneficial use to the fullest extent possible and states the waste, unreasonable use, or unreasonable method of use of water is prohibited.
California Code of Regulations, Title 17	Title 17, Division 1, Chapter 5, addresses the requirements for backflow prevention and cross connections of potable and non-potable water lines.
California Code of Regulations, Title 22	Title 22, Division 4, Chapter 15, requires the California Department of Health Services (DHS) review and approves the wastewater treatment systems to ensure they meet tertiary treatment standards.
California Code of Regulations, Title 23	Title 23, Division 3, Chapter 15, requires the RB to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
CWC Section 13523	Requires that a RB shall prescribe water reuse requirements for water, that is to be used or proposed to be used as recycled water after consultation with and upon receipt of recommendations from the DHS and if it determines such action to be necessary to protect the public health, safety, or welfare.
CWC Section 13550	Requires the use of recycled water for industrial purposes subject to recycled water being available and upon a number of criteria including: provisions that the quality and quantity of the recycled water are suitable for the use; the cost is reasonable; the use is not detrimental to public health; and the use will not impact downstream users or biological resources.
Integrated Energy Policy Report (Public Resources Code, Div. 15, Section 25300 et seq)	In the 2003 IEPR, consistent with State Water Resources Control Board Policy 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy stating they will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be “environmentally undesirable” or “economically unsound.”

SETTING

The regional setting for the new project has not changed; the new project site is approximately 1,300-feet northwest of the original project site. The new location lies

approximately 1.0-mile east of South San Francisco Bay (Bay), which is closer to the Bay's eastern shoreline than the original site.

PROJECT, SITE, AND VICINITY DESCRIPTION

The project owner proposes to construct a 600 megawatt energy generating facility in the east industrial area of the City of Hayward, Alameda County, California. The site is situated adjacent to and south of Depot Road in the east Hayward industrial area. Cabot Road has its southern terminus at Depot Road across from the northeast corner of the site. Enterprise Avenue lies to the south of the site boundary. The topography of the site is essentially flat, with a mean elevation of approximately 10 feet above mean sea level (MSL). Elevations to the east tend to increase gradually toward the east bay foothills. The site and immediate surrounding area to the north, east, and south are primarily commercial and industrial in nature. West of the site lies a large area of tidal flats and vacant property (RC 2006a, Section 3.1.1.10)

The existing uses of the proposed RCEC site include a 5.4-acre City parcel that is currently used for sewage sludge drying. Directly north of the City's parcel, an 8.6-acre parcel is currently occupied by a pallet storage and distribution business, a metals fabrication business, lumber storage yard, and a miscellaneous storage facility. Another parcel directly east of the 8.6-acre parcel is currently used as an automobile salvage and dismantling yard consisting of approximately 3.0-acres. Of the 18.8-acres of RCEC property, 16.5-acres would be fenced that include the East Bay Dischargers Authority (EBDA) easement. The construction parking and laydown areas are located east and south of the power plant site and are presently used as an auto storage yard and light industry facility respectively (RC 2006a, Section 3.3.1.1 and CH2MHill 2007a, Data Response 42-1).

PROJECT DESCRIPTION Figure 2 of this staff assessment, shows the project site, construction parking and laydown areas, and linear facilities. The linear facilities consist of the electric transmission line, natural gas supply line, potable water supply line, and sanitary sewer line. The natural gas pipeline route and a small portion of the transmission line route would be re-located. The natural gas pipeline would connect to the existing Pacific Gas and Electric Company's (PG&E) natural gas pipeline located along the Union Pacific Railroad easement to the east of the project. The pipeline would run entirely under Depot Road for a distance of approximately 3,800-feet. Both the potable water supply line and sanitary sewer line would run south from the RCEC site and connect to the existing City pipelines located under Enterprise Avenue.

There are two alternatives for the new 230 kV transmission line that would run in the existing 115 kV Grant-Eastshore transmission corridor between the RCEC Project and the PG&E Eastshore substation. The two alternative routes are shown on **PROJECT DESCRIPTION Figure 2.**

Water Supply and Wastewater Treatment

The City's Water Pollution Control Facility (WPCF) would continue to supply secondary effluent to the RCEC project. In the Amendment, the originally approved Advanced Water Treatment (AWT) facility has been replaced with a Title 22 Recycled Water Facility (RWF) to be owned and operated by the project owner. The project owner also

proposes a Zero Liquid Discharge (ZLD) system for the new project that would eliminate the discharge of process wastewater from the RCEC (RC 2006a, Section 2.1.5).

Because the AWT plant has been removed from the proposed project, the City would not own or operate any portion of the project. Instead of an AWT, the plant would include on-site Title 22 treatment equipment. The WPCF would provide secondary-treated effluent to the project, and the on-site Title 22 treatment system would be designed to produce tertiary treated recycled water suitable for unrestricted use.

Cooling tower blowdown would be treated in the ZLD system. The inclusion of the ZLD system, the addition of the Title 22 RWF, and removal of the AWT plant would involve some redesign of the water treatment systems and modifications to the site arrangement. The quantities of water used would remain nearly the same as under the original design. The quantities of wastewater produced would decrease significantly with the addition of the ZLD system (RC 2006a, Section 2.1.6).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The new RCEC project was analyzed to determine if it complies with LORS and meets the standards found in the California Environmental Quality Act (CEQA) Guidelines. The federal, state and local LORS presented in **SOIL AND WATER Table 1** were used to determine the threshold of significance for this analysis.

The following LORS and state policies were used to determine the threshold of significance. This threshold is based on the ability of the project to be built and operated without violating erosion, sedimentation, flood, surface or groundwater quality, water use (supply) or wastewater discharge standards.

- The Resource Conservation Recovery Act of 1976 seeks to prevent surface and groundwater contamination.
- Water Code Section 13551 requires the water resources of the state be put to beneficial use to the fullest extent they are capable, and the waste or unreasonable use or unreasonable method of use be prevented.
- City of Hayward Municipal Code Section 11, Article 2 requires the project owner to obtain a Permit for Water Service Connection.
- City of Hayward Municipal Code Section 11, Article 3 regulates the quantity and quality of wastewater discharge to the sanitary sewer system.
- City of Hayward Municipal Code Section 11, Article 5 authorizes the City to implement its municipal stormwater program for urban runoff.
- Title 17 of the California Code of Regulations addresses the requirements for backflow prevention and cross connections of potable and non-potable waterlines.
- Title 22 of the California Code of Regulations requires DHS review and approval of wastewater treatment systems to ensure they meet tertiary treatment standards for industrial processes and landscape irrigation.

- Title 23, Division 3, Chapter 15 of the California Code of Regulations requires the RB to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.

For those impacts that exceed the published standards, or do not conform to the established practices, mitigation will be proposed by staff to reduce or eliminate the impact. Such a determination will by necessity rely on science, technology, expert opinion, and best professional judgment to determine what the level of change to the baseline or pre-existing conditions should be.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The direct and indirect impacts and mitigation discussion presented below is divided into a discussion of impacts related to construction and a discussion of impacts related to operation. For each potential impact discussed, the project owner's proposed mitigation is presented and staff's determination of the adequacy of the proposed mitigation is discussed. If necessary, staff will propose additional mitigation measures and refer to specific conditions of certification related to a potential impact and the required mitigation measures.

Construction Impacts and Mitigation

As with the previous project, construction of the new RCEC would include soil excavation, grading, building construction, and installation of utility connections. Potential impacts to soil and water resources can be caused by increased erosion or the release of hazardous materials during construction.

Water and Wind Erosion

The topography of the RCEC site, laydown area, and linear features is nearly level with a mean elevation of approximately 10-feet above MSL. The project site is approximately 18.8-acres and is currently occupied by a number of industrial businesses and sludge stockpiles. All existing buildings, foundations, and paved surfaces would be removed as part of the RCEC construction. The construction parking and laydown areas would be located on several parcels covering a combined area of 8.7-acres (RC 2006a, Section 2.4.4 and CH2MHill 2007a, Data Response 42-1).

Construction of the RCEC would require grading and earthwork to bring the base elevation to above the 100-year floodplain elevation. Active soil grading would occur over a 12 to 18-month period within the project site. No significant grading would occur on the construction parking and laydown areas, but the project owner proposes to add additional gravel as necessary to stabilize the areas. During construction, stormwater would be diverted to catch basins for settling and eventual discharge to the Alameda County Flood Control and Water Conservation District's (ACFCWCD) stormwater channel (RC 2006a, Section 2.4.4 and CH2MHill 2007a, Data Response 42-1).

The draft Drainage, Erosion and Sedimentation Control Plan (DESCP) submitted by the project owner provides erosion control Best Management Practices (BMPs) for addressing soil erosion and treatment control methods for trapping eroded sediments during construction. The proposed BMPs include mulching, physical stabilization, dust suppression, storm drain inlet protection, earth dikes and drainage swales (CH2MHill

2007a, Data Response 41). However, given the existing on-site soil contamination from PCBs and petroleum hydrocarbons, potential impacts related to soil loss could be exacerbated and off-site transport of eroded sediments could lead to significant water quality impacts to the Bay.

In February 2003, the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) approved a new Alameda County Municipal Stormwater Permit (No. CAS0029831) that requires more stringent BMPs for new development. The project owner would comply with the requirements of the new municipal stormwater permit and those provisions as defined in the permit (Provision C.3) that set performance standards for new development and redevelopment. The requirements of the municipal permit will be added to Condition of Certification **SOIL & WATER 2** as part of Construction Storm Water Pollution Prevention Plan (SWPPP) (CH2MHill 2007a, Data Response 41). With the implementation of appropriate BMPs that are a requirement of the municipal stormwater permit (CAS0029831) and the DESCP, the project owner expects to keep soil loss due to water and wind erosion to a negligible amount that would not constitute a significant impact.

Staff agree that the proper selection and implementation of BMPs can reduce the impact to soil resources from water and wind erosion to a level that is less than significant. Conformance with the procedures in an approved DESCP would limit erosion and migration of any remaining contaminants that may be disturbed by construction from entering the ACFCWCD stormwater channel or waters of the state. Staff have reviewed the draft DESCP and the requirements of the Alameda Countywide Municipal Stormwater Permit. Those documents require the project owner to test and monitor soil and runoff from the RCEC site. Conditions of Certification **SOIL & WATER 1 & 2** would be amended to include Provision C.3 of NPDES Permit CAS0029831 and the specific requirements for a DESCP.

The DESCP, as described in Condition of Certification **SOIL & WATER 1**, is a standard condition of certification that has been a requirement for all approved power plant applications and amendments since 2005. Verification language for the condition requires the project owner to submit a copy of the DESCP to the City for review and comment no later than 90 days prior to the start of site mobilization and to the CPM for review and approval no later than 60 days prior to start of site mobilization. If the minimum requirement of 30 days for City review and comment is deemed infeasible, the project owner should coordinate with the City on an agreed upon schedule that will allow the City sufficient review time so the project owner can submit the DESCP to the CPM in a timely manner (no later than 60 days prior to site mobilization) that will not put the construction schedule in jeopardy. The maximum of 60 days for review and approval allows the CPM to evaluate the reasonableness of comments received from the City and to seek clarification or modification as necessary.

Additionally, Condition of Certification **SOIL & WATER 1** requires consistency with the grading and drainage plan as described in Condition of Certification **CIVIL-1**, and that relevant portions of the DESCP shall show approval by the CBO. This verification language is included because experience has shown that the temporary or permanent drainage features contained in the DESCP are often not consistent with the grading and drainage plan specified in **CIVIL-1**. This provision ensures all proposed on-site

drainage features contained in the DESCP are consistent with the grading and drainage features specified in Condition of Certification **CIVIL-1**, which are approved by the CBO.

Experience has also shown that the inclusion of a narrative in the monthly compliance report that details the effectiveness of the DESCP provides the CPM with additional compliance confirmation for both the DESCP and the grading and drainage plan. Although construction stormwater will be regulated under the General Construction NPDES permit which includes monitoring and enforcement by the City, there is no verification language in Condition of Certification **SOIL & WATER 2** specifying a narrative be submitted in the monthly compliance report. With the specific requirements contained in Conditions of Certification **SOIL & WATER 1 & 2**, staff believe soil loss and erosion from construction of the RCEC would not cause a significant impact.

Surface and Groundwater Quality

The elevation of the RCEC site ranges from 3-feet above MSL to around 11-feet above MSL. The project owner proposes to bring in engineered fill to bring the base elevation of the RCEC site to approximately 10-feet above MSL. Groundwater was encountered at depths of 5-feet below ground surface (bgs) to 15-feet bgs. The project owner would not use groundwater during construction, and based on the amount of fill required to bring the site to approximately 10-feet above MSL, the estimated depth to groundwater would be approximately 12-feet bgs (CH2Mhill 2007a, Data Response 28).

If groundwater is encountered during construction, the project owner proposes dewatering and hazardous waste management BMPs. Any groundwater encountered would be sampled prior to off-site disposal (CH2Mhill 2007a, Data Response 42-1). Staff agree the likelihood of encountering groundwater during construction is remote, and based on the project owners proposed dewatering BMPs in their draft Construction SWPPP and DESCP, no impacts to surface and groundwater resources would occur during construction of the RCEC project.

Soil and Groundwater Contamination

The new RCEC site and laydown parcels are located in a densely developed industrial area that is zoned for industrial and heavy industrial uses. The daft Phase II Environmental Site Assessments (ESA) prepared by LFR, Inc. dated November 20, 2006, indicates that polychlorinated biphenyls (PCBs) and petroleum hydrocarbons were detected in several locations on the RCEC site. The Phase II ESA also indicates that soil excavation and off-site disposal is appropriate in some areas, but does not provide specific dimensions or the specific locations (LFR 2006e).

To ensure the site is adequately characterized and remediated for known soil contaminants, condition of certification **SOIL & WATER 5** has been approved in the initial Decision that requires the project owner to prepare a site assessment map to further delineate contaminated areas. The **Waste Management** Section of this analysis provides additional condition(s) of certification that will identify the appropriate administrating agency to review and approve a Cleanup Plan or Soil Management Plan in conjunction with City of Hayward Fire Department. Through implementation of an appropriate site cleanup plan combined with erosion control measures, the possibility of contaminates leaving the site would be minimized.

Operation Impacts and Mitigation

Operation of RCEC at the proposed new site could lead to potential impacts to soil, stormwater runoff, water supply, and wastewater treatment. Soils may be impacted through erosion or the release of hazardous materials used in the operation of the RCEC. Stormwater runoff from the RCEC site could result in potential impacts if there is an increase to flowrate or volume discharge from the site to the ACFCWCD drainage channel. Water quality could be impacted by the discharge of eroded sediments from the RCEC site; discharge of hazardous materials released during operation; or migration of existing hazardous materials present in the subsurface soil.

Soil Erosion

The proposed 18.8-acre RCEC site is presently used for a variety of industrial activities including auto wrecking, pallet storage, sludge drying, and metal finishing. After the power plant site has been filled, graded, compacted, covered with concrete or gravel, and the drainage system installed, there would be minimal potential for natural erosion. Routine vehicular access to the site during operation would be limited to exiting roads. Standard operating activities would not involve disruption of soil (RC 2006a, Section 3.10.1.5).

Soil impacts and the potential for soil erosion would not be significant. An Industrial SWPPP for plant operation would be developed to set performance standards and monitoring provisions would be required for effective stormwater pollution identification and mitigation. Condition of Certification **SOIL & WATER 3** would require the submittal and implementation of a site-specific Industrial SWPPP and is amended to include the provisions of the City's Municipal Code, Chapter 11, Article 5 and the municipal NPDES Permit No. CAS0029831. With the implementation of the Industrial SWPPP that is to be in compliance with the City's Municipal Code, Chapter 11, Article 5 and Provision C.3 of the municipal permit, no significant impacts to soil resources from plant operation are expected.

Surface and Groundwater Quality

Development of roads, buildings, and other impermeable surfaces as part of the RCEC project would not substantially increase the runoff rate or volume from the RCEC site. It is not anticipated there would be increased stormwater runoff from the site or the potential for increased sediment and contaminants conveyed off-site.

Stormwater

Due to the new project location, the on-site stormwater retention pond is no longer necessary to protect endangered wildlife and has been removed from the project. As with the original project, runoff from areas within the RCEC site where rainfall comes in contact with equipment or drains from maintenance areas would be collected and combined with other site drainage then drained through an oil-water separator. The oil-water separator would remove floating oil, grease, and other hydrocarbons. The oil free water from the separator would be sent to the sanitary sewer. Stormwater runoff from non-contained areas of the RCEC would be diverted to a series of catch basins and discharged to the ACFCWCD stormwater channel running along the western boundary of the project (RC 2006a, Section 3.10.1.3).

The project owner proposes to submit and implement an Industrial SWPPP for the protection of surface and groundwater and to meet the requirements of the City's Municipal NPDES Permit (CAS0029831). Condition of Certification **SOIL & WATER 3** will be amended to include the requirements of the municipal permit per the requirements of Municipal Code, Chapter 11, Article 5 for urban stormwater control. The proposed RCEC would prevent increased stormwater runoff through the development of structural BMPs in compliance with Condition of Certification **SOIL & WATER 3**.

Condition of Certification **SOIL & WATER 9** has been added and requires the project owner to comply with Municipal Code, Chapter 11, Article 3 for the discharge to the City's sanitary sewer system. Staff believe, with the submittal and implementation of the site-specific requirements in Conditions of Certification **SOIL & WATER 3 & 9**, including compliance with all municipal codes and discharge permits, impacts to surface water from stormwater runoff during RCEC operation would be less than significant.

Groundwater

Operation activities at the RCEC would have minimal potential to impact groundwater resources in the project area. The project owner would not use groundwater during operation, and based on the amount of fill required to bring the site to approximately 10-feet above MSL, the estimated depth to groundwater would be approximately 12-feet bgs (CH2MHill 2007a, Data Response 28). During plant operation, the RCEC would not use or impact groundwater resources.

No underground chemical storage tanks are proposed at the project site. No release of contaminated stormwater from the plant site is expected; and therefore, no contact with groundwater would occur. No significant impacts to groundwater resources would result from plant operation if a site specific Industrial SWPPP that includes the City's Municipal Code, Chapter 11, Articles 5 and the discharge requirements of Municipal Code, Chapter 11, Article 3 are implemented per Conditions of Certification **SOIL & WATER 3 & 9**.

Tsunami and Seiche

Tsunamis are waves typically generated offshore or within large bodies of water during a subaqueous fault rupture or a subaqueous landslide event. Seiches are waves generated within a large body of water caused by the horizontal movement of an earthquake. Due to the proximity of the project site to the Bay, there is a potential for the RCEC site to be impacted by a tsunami or seiche resulting from the occurrence of a major earthquake along the San Andreas or Hayward faults.

According to the City's 2002 General Plan, a tsunami with a wave height of 20 feet at the Golden Gate bridge is likely to occur approximately once every 200 years and would result in a run-up of less than 10 feet above sea level if it reached the City. Since the curbs and floors of the RCEC would be at an elevation of approximately 11-feet above MSL, and the site is located approximately 1.0-mile from the shore of the Bay, the likelihood the site would be impacted by a tsunami or seiche is low (COH 2002a).

Flooding Potential

The RCEC project site is located approximately 1,300 feet north of the previous location, and the majority of the project site is now located within the revised Federal Emergency Management Agency (FEMA) 100-year floodplain. The project site would be filled and compacted, as necessary, to ensure the minimal risk of flooding and would be in compliance with FEMA policies and the City ordinance that require the plant to be above the 100-year flood level (RC 2006a, Section 3.10.1.2). Condition of Certification **SOIL & WATER 7** requires the project owner to provide evidence of its request for a flood zone map revision with the City and to provide evidence of FEMA's issuance of a conditional letter of map revision (CLOMR).

Water Supply

Water required for domestic uses and fire fighting would continue to be provided by the City. The quantities of water used would remain nearly the same as under the original design. The City receives its potable water from the City and County of San Francisco's regional water system operated by the San Francisco Public Utility Commission, and delivers only potable water to its customers. Potable water demand is estimated to total about 3 gpm or approximately 4 acre-feet per year (AFY) (RC 2006a, Section 2.1.5). Although this volume of consumption is over four times the amount of potable water consumed by operations personnel at combine cycle plants of comparable size, staff felt a LORS analysis of this relatively small amount of potable water consumption was not warranted.

Condition of Certification **SOIL & WATER 4** presently allows the use of potable water as a backup cooling source for industrial purposes. The use of potable water for industrial purposes is in conflict with Section 13551 of the State Water Code. In Data Response 39, the project owner provides extensive Title 22 RWF reliability data which includes the statement: *The RWF will include complete redundancy for each unit process such that the facility can operate at design capacity with one unit in each process out of service.* While Data Response 41 states: *During normal operation, no potable water will be used for process or cooling purposes at the RCEC. The RCEC will include a recycled water storage tank of sufficient capacity to meet the peak demand of the RCEC for a period of up to 4 hours. The volume in this tank should be sufficient to cover the most likely unavoidable interruptions in the supply of recycled water to the RCEC*. Because of the design and redundancy incorporate in the Title 22 RWF and the location of the WPCF (where disruption of service is expected to be very infrequent and last only a matter of days), staff are proposing to cap the amount of potable water use for process and cooling purposes to 20 days (480 hours) in any one operating year in the amended Condition of Certification **SOIL & WATER 4** (CH2Mhill 2007a, Data Responses 39 & 41).

Recycled Water Supply and Treatment

The RCEC would use recycled water for steam production and power plant cooling in a hybrid, wet/dry plume-abated, mechanical-draft cooling tower. The City's WPCF would provide secondary effluent to the RCEC. The secondary effluent constituents from the WPCF would remain the same as those described in the original Decision. The on-site Title 22 RWF would treat the secondary effluent to Title 22 disinfected tertiary standards

that can be used for unrestricted use (except drinking). The project owner proposes to use tertiary treated recycled water for all plant processes.

The secondary effluent would be delivered to the site via a new 50-foot pipeline originating from the southeast corner of the project to the adjacent 48-inch secondary effluent pipeline that runs along the southern edge of the RCEC. Operation of the RCEC is projected to require up to 2,793 gallons per minute (gpm) of secondary effluent from the City, or approximately 3,600 AFY. The influent pump station would pump secondary effluent from the existing 48-inch pipeline to the clarification process units. From those units, flow through the remainder of the treatment process would be by gravity. Effluent from the clarifiers would continue on to disk filters that would provide the filtration required to meet Title 22 tertiary treatment standards. The filtered water would continue on to the chlorine contact basins. The basins would be designed to provide the disinfection contact time required for unrestricted use of tertiary treated recycled water (RC 2006a, Section 2.1.6.1).

The production and use of recycled water is regulated under state law Section 13523 of the California Water Code requires the SFBRWQCB to prescribe water reuse requirements for water that is to be used as recycled water after consultation with the DHS for protection of the public health and safety. In addition, California Code of Regulations Title 17 address the health and safety requirements of backflow prevention and cross connections of potable and non-potable water lines; where as, Title 22 requires DHS to approve recycled water systems through the review and approval of a DHS mandated engineering report. To meet federal and state laws, an amended Condition of Certification **SOIL & WATER 4** is proposed that will include the requirements for an engineering report and any other DHS or SFBRWQCB permits. Additional language has been added to **SOIL & WATER 4** requiring tertiary treated recycled water be used for all non-potable uses including landscape irrigation.

Compliance with the amended Condition of Certification **SOIL & WATER 4** would ensure that the City and the project owner comply with federal and state law as it applies to the production and use of recycled water. Through compliance with state law, there would be no impacts from the production and use of recycled water. In addition, Condition of Certification **SOIL & WATER 6** has been amended to delete any reference to the AWT and language added for the submittal of long-term contracts from the City for delivery of potable water and secondary effluent to the RCEC.

Wastewater Disposal

As originally approved in the Commission Decision, the RCEC would use an AWT plant both to treat the secondary effluent and the wastewater leaving the site. With this amendment, the AWT plant has been removed from the project and has been replaced with an on-site Title 22 RWF. In addition, a ZLD system has been added to the project. With the removal of the AWT plant and the addition of the ZLD system, wastewater from the cooling tower would no longer be treated on-site and returned to the WPCF for disposal through the EBDA outfall pipeline to the Bay. Instead, cooling tower blowdown would be sent to the ZLD system.

The ZLD system would evaporate the water and the solids would be compacted into a salt cake to be disposed of off-site. The use of the ZLD would decrease the blowdown wastewater stream from approximately 33 gpm under average conditions (46 gpm under peak conditions) to virtually zero. In addition, copper and nickel from the secondary effluent would not be discharged to the EBDA pipeline, thus avoiding any potential violations of the EBDA permit. A small amount of sludge from the clarifier at the Title 22 RWF would be sent back to the WPCF for treatment via the sanitary sewer line. Filter backwash water would be recycled to the influent pump station. With the ZLD system, process wastewater would be recycled and reused to the extent practicable and the majority of the metals present in the secondary effluent would not be released off-site as wastewater effluent (RC 2006a, Section 2.1.6.3).

Sanitary Wastewater

Sanitary wastewater generated from sinks, toilets and other sanitary facilities at the RCEC would discharge to the City's sanitary sewer system. The discharge of any wastewater to the City's sewer system would be subject to the requirements of the City's Municipal Code Section 11, Article 3 that regulates the quantity and quality of discharges to the sewer system. Condition of Certification **SOIL & WATER 9** has been added so that the RCEC meets the requirements of the City's Municipal Code, Chapter 11, Articles 3 for the discharge to the City's sanitary sewer system. Condition of certification **SOIL & WATER 9** requires the project owner to provide the Compliance Project Manager (CPM) a copy of the discharge permit that complies with the City's Municipal Code Section 11, Article 3. Compliance with **SOIL & WATER 9** will ensure there are no significant impacts or conveyance of prohibited pollutants to the City's sanitary sewer system.

CUMULATIVE IMPACTS AND MITIGATION

Soil Erosion

During the construction phase of the RCEC, two other major construction projects in the vicinity of the RCEC may be undergoing construction. The two projects are the proposed Eastshore power plant and SR-92 improvements. Construction activities related to the RCEC project may cause a temporary increase in cumulative wind and water erosion when combined with the soil disturbing activities of the above mentioned projects until the RCEC site is stabilized. Implementation of the DESCP and SWPPP for Construction Activities would minimize the potential for adding to the cumulative impacts due to soil erosion.

Surface Hydrology

Disturbed soils could increase the sediment and pollution loading to the ACFCWCD drainage channel and the Bay when combined with the potential pollution loading caused by the construction of the Eastshore power plant and the SR-92 improvements. However no cumulative impacts are expected if BMPs are employed in accordance with the DESCP to minimize erosion during and after construction. Both stormwater and non-stormwater discharge from dewatering activities would be monitored and disposed of properly.

Development of the RCEC site would redirect surface drainage to a catch basin for discharge to the ACFCWCD drainage channel. The implementation of the DESCP and the Construction and Industrial SWPPPs and compliance with state and local LORS would mitigate potential cumulative surface hydrology impacts from the RCEC project to less than significant levels.

Water Supply

Staff have not identified any development projects that would diminish the supply of potable water or secondary recycled water from the City's municipal water system or WPCF; therefore, no cumulative impacts to the City's potable water or secondary recycled water supply would occur.

Groundwater

The project would not use groundwater. There is a slight possibility groundwater may be encountered during construction and require dewatering. The water encountered would be shallow groundwater and could be contaminated. Groundwater requiring dewatering during construction would be managed in accordance with the DESCP and SWPPPs for Construction and Industrial Activities. The entire RCEC site would be covered with impervious materials, gravel, or landscaping after construction. Chemical storage areas would have secondary containment. All surface flow from the project site would first flow to the catch basins before discharge to ACFCWCD drainage channel. There would be no cumulative impacts from RCEC construction or operation to groundwater resources.

Wastewater

The wastewater streams from the RCEC project include plant drainage from equipment areas, contact stormwater, clarifier sludge, and sanitary wastewater. The combined wastewater flow would be monitored to assure compliance with the City's municipal codes and discharge limits for use of the sanitary sewer system. Compliance with Chapter 11, Article 2 of the City's Municipal Code would ensure no cumulative impacts to the sanitary sewer system would occur.

RESPONSE TO AGENCY COMMENTS

Staff received comments from the SFBRWQCB by letter dated December 20, 2006 (CRWQB 2006a). SFBRWQCB staff reviewed the Amendment Petition and requested the project owner comply with the requirements of the Municipal Stormwater NPDES Permit CAS0029831 for stormwater discharge from new development or significant redevelopment. Staff have included the municipal permit in both amended Conditions of Certification **SOIL & WATER 2 & 3** as a requirement of the Construction and Industrial SWPPPs.

COMPLIANCE WITH LORS

A number of new LORS were presented in **SOIL AND WATER Table1**. The RCEC, as proposed in Amendment No. 1, would comply with the following LORS if all amended conditions of certification are implemented.

- The Resource Conservation Recovery Act of 1976 by the proper handling and discharge of wastewater.
- The California Safe Drinking Water and Toxic Enforcement Act by establishing secondary containment in chemical storage areas and testing of all wastewater discharges.
- The California Constitution, Article X, Section 2 by using recycled water for plant process water.
- City of Hayward Municipal Code, Chapter 11, Article 2 for the permitted use and hookup to the City's potable water system.
- City of Hayward Municipal Code, Chapter 11, Article 3 for the permitted use and hookup to the City's sanitary sewer system.
- City of Hayward Municipal Code, Chapter 11, Article 5 for the discharge of construction and operation stormwater in compliance with City's municipal NPDES permit (CAS0029831).
- Title 17 of the California Code of Regulations, by ensuring the DHS confirms the requirements for backflow prevention and cross connections of potable and non-potable water lines.
- Title 22 of the California Code of Regulations, by ensuring the DHS reviews the recycled water treatment systems to ensure they meet tertiary treatment standards for protection of public health.
- Title 23 of the California Code of Regulations requiring the SFBRWQCB to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable. And to ensure the wastewater treatment plant operator or site supervisor is qualified for the effective operation of wastewater and water recycling treatment plants.
- The Integrated Energy Policy Report (CEC 2003) by using reclaimed water for plant process water.

CONCLUSIONS

Staff have not identified any unmitigated significant impacts to soil and water resources provided all proposed and amended conditions of certification are met. The RCEC project would comply with all applicable soil and water resources LORS. Potentially significant impacts would be mitigated through the preparation and implementation of various construction and operating plans, reports and permits which, if not implemented or complied with, could result in, soil erosion, contamination to surface and ground water, or violations of wastewater treatment and discharge requirements.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The following soil and water resources conditions of certification are the original conditions of certification contained in the Decision or modifications to existing conditions that staff have identified as a result of federal and state law or project

changes proposed by the project owner submitted in Amendment No. 1 for the RCEC. Strikeout is used to indicate deleted language and underline for new language.

SOIL & WATER 1 Prior to beginning any site mobilization activities, the project owner shall obtain CPM approval for a ~~Grading~~ site-specific Drainage, Erosion and Sedimentation Control Plan (DESCP) that address all project elements. The ~~Grading and Erosion Plan~~ DESCP shall include and be consistent with the standards normally required under the City of Hayward's Grading Permit. The DESCP shall be consistent with the grading and drainage plan as required by condition of certification CIVIL-1 and may incorporate by reference any Storm Water Pollution Prevention Plan (SWPPP) developed in conjunction with any state or municipal NPDES permit. ~~The plan shall be submitted to the CPM for approval and to the City of Hayward and County of Alameda for review and comment~~ The DESCP shall contain the following elements:

A. Vicinity Map – A map(s) at a minimum scale 1"=100' shall be provided indicating the location of all project elements with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

B. Site Delineation – All areas subject to soil disturbance for the RCEC project (project site, lay down area, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing boundary lines of all construction area and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

C. Watercourses and Critical Areas – The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. Indicate the proximity of those features to the RCEC project construction, lay down, and landscape areas and all transmission and pipeline construction corridors.

D. Drainage Map – The DESCP shall provide a topographic site map(s) at a minimum scale 1"=100' showing all existing, interim and proposed drainage systems and drainage area boundaries. On the map, spot elevations and contours shall be extended off-site for a minimum distance of 100 feet.

E. Drainage Narrative – The DESCP shall include a narrative of the drainage measures to be taken to protect the site and downstream facilities. The narrative should include the summary pages from the hydraulic analysis prepared by a professional engineer/erosion control specialist. The narrative shall state the watershed size(s) in acres used in the calculation of drainage control measures. The hydraulic analysis should be used to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the RCEC project construction and laydown areas.

F. Clearing and Grading Plans – The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan

shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography.

G. **Clearing and Grading Narrative** – The DESCP shall include a table with the quantities of material excavated or filled for the site and all project elements of the RCEC project (project site, lay down areas, transmission corridors, and pipeline corridors) to include those materials removed from the site due to demolition, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported. The table shall distinguish whether such excavations or fill is temporary or permanent and the amount of material to be imported or exported.

H. **Best Management Practices** – The DESCP shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction (initial grading/demolition, excavation and construction, and final grading/stabilization). Treatment control BMPs used during construction should enable testing of stormwater runoff prior to discharge to the stormwater system. BMPs shall include measures designed to prevent wind and water erosion in areas with existing soil contamination. Treatment control BMPs used during construction should enable testing of groundwater and stormwater. If runoff has unacceptable levels of contaminants including petroleum hydrocarbons or PCBs, the runoff must be treated to acceptable levels prior to discharge.

I. **Best Management Practices Narrative** – The DESCP shall show the location (as identified in H above), timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading/demolition, during project excavation and construction, final grading/stabilization, and post-construction. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule should include post-construction maintenance of structural control BMPs, or a statement provided when such information will be available.

Verification: No later than 90 days prior to start of site mobilization, the project owner shall submit a copy of the DESCP to the City of Hayward (City) for review and comment. No later than 60 days prior to start of site mobilization, the project owner shall submit the DESCP and the City's comments to the CPM for review and approval. The CPM shall consider comments received from the City on the DESCP before issuing approval. The DESCP shall be consistent with the grading and drainage plan as required by condition of certification **CIVIL-1** and relevant portions of the DESCP shall clearly show approval by the Chief Building Official. The DESCP shall be consistent with Stormwater Pollution Prevention Plan (SWPPP) developed in conjunction with the City's municipal NPDES Permit No. CAS0029831 for Construction Activity. The project owner shall provide in the monthly compliance report a narrative on the effectiveness of the drainage, erosion and sediment control measures; the results of monitoring and

maintenance activities; and the dates of any dewatering activities. ~~The Grading and Erosion Control Plan shall be submitted to the CPM for review and approval, and to the City of Hayward (Public Works Department) and Alameda County (Public Works Agency) for review and comment at least sixty days prior to start of any site mobilization activities. The CPM, via concurrence from local agencies, must approve the final Erosion Control Plan prior to the initiation of any site mobilization activities.~~

SOIL & WATER 2: The project owner shall comply with the requirements of the General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Storm Water Associated with Construction Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the construction of the RCEC site, laydown area, and all linear facilities. The Construction SWPPP shall abide by the City of Hayward's (City) Stormwater Management and Urban Runoff Control Ordinances (Chapter 11, Article 5) set forth in NPDES Permit No. CAS0029831. ~~submit a Notice of Intent for construction under the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity to the State Water Resources Control Board (SWRCB) and obtain CPM approval of the related Storm Water Pollution Prevention Plan (SWPPP) for Construction Activity prior to beginning site mobilization activities. The SWPPP will include final construction drainage design and specify BMP's for all on- and off-site RCEC project facilities.~~

Verification: ~~At least 60 days prior to the start of any site mobilization, the SWPPP for Construction Activity and a copy of the Notice of Intent for construction under the General NPDES Permit for Discharges of Storm Water Associated with Construction Activity filed with the RWQCB, shall be submitted to the CPM. Approval of the final plan by the CPM must be received prior to initiation of any site mobilization activities.~~ The project owner shall submit to the CPM a copy of the Construction SWPPP that includes all requirements of Hayward Municipal Code Chapter 11, Article 5 for Stormwater Management and Urban Runoff Control prior to site mobilization and retain a copy on-site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the City about the City's Stormwater Management and Urban Runoff Control Ordinances and the General NPDES permit for the Discharge of Stormwater Associated with Construction Activities within 10 days of its receipt or submittal. This information shall include a copy of the Notice of Intent for the project.

SOIL & WATER 3: The project owner shall comply with the requirements of the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of the RCEC. The Industrial SWPPP shall abide by the City of Hayward's Stormwater Management and Urban Runoff Control Ordinances (Chapter 11, Article 5) set forth in NPDES Permit No. CA0029831. ~~The project owner shall submit a Notice of Intent for operating under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity to the State Water Resources Control Board (SWRCB), and obtain CEC Staff approval prior to initiating project operation with review and comments from the San Francisco Regional Water Quality Control Board (SFBRWQCB) of the related~~

~~Storm Water Pollution Prevention Plan (SWPPP) for Industrial Activity. The SWPPP will include final operating drainage design and specify BMP's and monitoring requirements for the RCEC project facilities. This includes final site drainage plans and locations of BMP's.~~

Verification: ~~At least 60 days prior to the start of project construction , the SWPPP for Industrial Activity and a copy of the Notice of Intent for operating under the General NPDES Permit for Discharges of Storm Water Associated with Industrial Activity filed with the RWQCB, shall be submitted to the CPM. Approval of the SWPPP plan by the CPM, with review and comment by the SFBRWQCB, must be received prior to initiation of project operation.~~ The project owner shall submit to the CPM a copy of the Industrial SWPPP that includes all requirements of Hayward Municipal Code Chapter 11, Article 5 for Stormwater Management and Urban Runoff Control prior to commercial operation and retain a copy on-site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the City about the City's Stormwater Management and Urban Runoff Control Ordinances and the General NPDES permit for the Discharge of Stormwater Associated with Industrial Activity within 10 days of its receipt or submittal. The Industrial SWPPP shall include a copy of the Notice of Intent for the project.

SOIL & WATER 4: The project owner shall use tertiary-treated water supplied from the ~~City of Hayward's Advanced Water Treatment (AWT) Plant~~ on-site Title 22 Recycled Water Facility (RWF) as its primary source for cooling and process water supply. Potable water may be used for cooling and process purposes only in the event of an unavoidable interruption of the on-site Title 22 RWF supply or secondary effluent from the City of Hayward ~~AWT Plant supply~~, but not to exceed ~~45 days (1080 hours)~~ 20 days (480 hours) in any one operational ~~calendar~~ year. ~~Fresh~~ Potable water used for domestic purposes shall be metered separately from ~~fresh~~ potable water used for cooling and process water supply. The project owner will notify the CPM in writing if potable water is used for cooling or process purposes and provide an explanation of why the back-up supplies are being used. ~~However, potable water may be used for cooling and process purpose in excess of 45 days per calendar year if an unavoidable interruption of the AWT supply is due to an Act of God, a natural disaster, an unforeseen emergency or other unforeseen circumstance outside the control of the project owner. If one of the aforementioned unavoidable interruptions should occur, the CPM, project owner and the City of Hayward shall confer and determine how best to restore the AWT supply as soon as practicable~~.

The RCEC will use tertiary recycled water for all non-potable uses including landscape irrigation. The RCEC will comply with requirements of Title 22 and Title 17 California Code of Regulations. Prior to the use of recycled water for any purpose, the owner shall submit a Title 22 Engineering Report that has been approved by the Department of Health Services (DHS) and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB).

The project owner shall prepare and submit to the CPM an annual summary that will include the monthly range and monthly average of daily water usage

in gallons per day, and total water (range and average) used by the project on a monthly and annual basis in acre-feet. The annual summary shall distinguish sources (recycled or potable) and the uses (cooling, process, domestic, etc.) of the specified source. The project owner will obtain copies of project water use records derived from the City of Hayward's recycled and potable revenue meters. The project owner will not use more than 4 AFY of potable water in any consecutive 12 months of operation for sanitary and domestic purposes.

Verification: Prior to the use of recycled water for any purpose the project owner shall submit to the CPM the water supply and distribution system design and the Engineering Report for the Production, Distribution and Use of Recycled Water approved by DHS and the SFRWQCB demonstrating compliance with this condition. The recycled water supply and distribution system design shall be included in the final design drawings submitted to the CBO as required in Condition of Certification **Civil 1**.

The Engineering Report for the Production, Distribution and Use of Recycled Water shall be prepared in accordance with Title 22 and Title 17 of the California Code of Regulations, the Health and Safety Code, and the Water Code. The project owner shall comply with any reporting and inspection requirements set forth by DHS and the SFRWQCB to fulfill statutory requirements. The project owner shall submit copies to the CPM of all correspondence between themselves and DHS or the SFRWQCB within 10 days of receipt or submittal.

The project owner will submit as part of its annual compliance report a water use summary to the CPM on an annual basis for the life of the project. Any significant changes in the water supply for the project during construction or operation of the plant shall be noticed in writing to the CPM at least 60 days prior to the effective date of the proposed change.

SOIL & WATER 5: Due to the potential for encountering soil contamination during construction at the site of the RCEC, it is necessary to perform additional Phase II investigations prior to any site mobilization activities, and prepare a site assessment map to further delineate contaminated areas. Contaminated areas shall be identified on construction excavation plans, and any soil and/or groundwater encountered in these areas will be segregated and held on-site for sampling and analysis, until proper handling, treatment or disposal can be determined. Stockpiled soil will be covered to prevent run-on or runoff, and groundwater will be stored in appropriate tanks or containers. Soil sampling requirements shall consist of a 4-point composite sample for every 500 to 1,000 cubic yards of soil. Analytes are to be selected based on Phase II Site Assessment results. Details of the Site Assessment and Remediation Program are to be provided to the City of Hayward Fire Department and SFRWQCB for review and comment.

Verification: Sixty days prior to site mobilization, the project owner will provide evidence of compliance with the Site Assessment and Remediation Workplan as approved by the City of Hayward Fire Department and the San Francisco Bay RWQCB, and evidence of site closure. If the agencies direct remediation in conjunction with construction rather than prior to construction, then evidence of site closure must be

provided 30 days prior to project operation. A quarterly status report will be provided to the CPM addressing site assessment and remediation activities, with the first status report due in January 2002, or within 30 days of AFC certification, whichever occurs first.

SOIL & WATER 6: Prior to site mobilization, the project owner shall provide the CPM with two (2) copies of an executed and final Water Supply Agreement in accordance with the City of Hayward (City) Municipal Code Section 11, Article 2 and any other service agreements with the City for obtaining potable water for the construction and operation of the Russell City Energy Center project. The project owner shall also provide the CPM with two (2) copies of an executed and final Recycled Water Supply Agreement that includes the Master Discharge Permit from the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) for the production and delivery of recycled water by the City's Water Pollution Control Facility (WPCF).

The agreements shall detail any requirements, conditions, or restrictions on the project owner for the use of potable water and or secondary treated recycled water. The project owner shall not connect to the City's potable water or secondary effluent pipelines without final approval from the City. The project owner shall provide the CPM copies of the final approval from the City and all monitoring or other reports required by the agreements. The project owner shall notify the CPM of any violations of the agreements terms and conditions, the actions taken or planned to bring the project back into compliance with the agreements and the date compliance was reestablished. ~~Prior to any site mobilization activities, the project owner shall provide the CPM with the executed Service Agreement with the City of Hayward detailing the commercial terms for operation and maintenance of the Advanced Water Treatment (AWT) Plant, supply of recycled and potable water, and permitting under the City of Hayward's pretreatment program for treatment and disposal of process, cooling and stormwater waste streams at the City of Hayward's WPCF~~.

Verification: At least 60 days prior to ~~beginning any~~ site mobilization ~~activities~~, the project owner shall submit to the CPM two (2) copies of the executed Water Supply Agreement and any other service agreements between the project owner and the City for obtaining potable water for construction and operation of the RCEC in accordance with City Municipal Code Section 11, Article 2. ~~an executed Service Agreement with the City of Hayward detailing the commercial terms for operation and maintenance of the AWT Plant, supply of potable water, and permitting under the City of Hayward's pretreatment program for treatment and disposal of process, cooling and stormwater waste streams at the City of Hayward's WPCF.~~

Prior to the use of recycled water (secondary or tertiary treated) for any purpose, the project owner shall submit to the CPM two (2) copies of an executed and final Recycled Water Supply Agreement between the project owner and the City for the supply of secondary effluent. The Recycled Water Supply Agreement will include the Master Discharge Permit from the SFBRWQCB for the production and delivery of recycled water by the WPCF.

During operations, the project owner shall submit any water quality monitoring reports for potable or recycled water use required by the City to the CPM in the annual compliance report. The project owner shall submit any notice of violations from the City to the CPM within ten (10) days of receipt and fully explain the corrective actions taken in the annual compliance report. The project owner shall submit any notice of violation of the agreements' terms and conditions to the CPM within ten (10) days of receipt and shall fully explain the corrective actions taken in the next monthly compliance report or annual compliance report, as appropriate.

SOIL & WATER 7: Prior to any site mobilization activities, the project owner shall provide the CPM with evidence of its request for a flood zone map revision with the City of Hayward, and FEMA's issuance of a conditional letter of map revision (CLOMR). The project owner shall provide evidence of submittal of as-built plans to City of Hayward in order to obtain a final letter of map revision (LOMR).

Verification: Thirty (30) days prior to site mobilization, the project owner shall submit to the CPM evidence of its request for a flood zone map revision with the City of Hayward, and FEMA's issuance of a conditional letter of map revision (CLOMR). Within sixty (60) days following the RCEC commercial operation date, the project owner shall submit to the CPM evidence of submittal of as-built plans to the City of Hayward in order to obtain a final letter of map revision (LOMR).

SOIL & WATER 8: Prior to the start of construction, the project owner shall provide the CPM with evidence of a Flood Canal Tie-In Permit to the Alameda County Public Works Agency (Flood Control and Water Conservation District).

Verification: At least thirty (30) days prior to construction, the project owner shall submit to the CPM evidence of submitting an Application for a Flood Canal Tie-In Permit to the Alameda County Public Works Agency, Flood Control and Water Conservation District. The project owner shall also obtain a Section 401 Clean Water Act certification from the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) or provide a letter from the SFBRWQCB stating that 401certification is not required.

SOIL & WATER 9: Prior to commercial operation, the project owner shall provide the CPM and the City of Hayward (City) with all the information and data necessary to satisfy the City's pretreatment requirements for the discharge of industrial and sanitary wastewater to the City's sewer system. The project owner shall provide the CPM with two (2) copies of an executed and final discharge permit for industrial and sanitary wastewater discharge in accordance with Municipal Code Section 11, Article 3 and any other service agreements with the City for discharge to the City's sanitary sewer system. During operation, any monitoring reports provided to the City shall be provided to the CPM. The CPM shall be notified of any violations of discharge limits or amounts.

Verification: No later than sixty (60) days prior to commercial operation, the project owner shall submit the information and data required in accordance with Municipal Code Section 11, Article 3 and any other service agreements for wastewater discharge to the City's sanitary sewer system to the City for review and comment, and to the CPM

for review and approval. During operations, the project owner shall submit any water quality monitoring required by the City to the CPM in the annual compliance report. The project owner shall submit any notice of violations from the City to the CPM within ten (10) days of receipt and fully explain the corrective actions taken in the annual compliance report.

REFERENCES

CEC 2002b –California Energy Commission/Commissioners (tn:26635). Commission Decision for Russell City - POS.

CH2MHILL 2007a – CH2MHILL/D.M. Davy (tn: 38948). Applicant's Responses to Staff Data Requests 1-52. Cover letter docketed, transmittal letter, and attached POS. 01/17/2007. Rec'd 01/17/2007.

COH 2002a. City of Hayward *General Plan, Conservation and Environmental Protection Element.* March 2002.

CRWQB 2006a – CRWQB/B. Wines (tn: 38743). Comments on the Request for Agency Participation in the Review of the Russell City Energy Company, LLC, Amendment Petition – SCH No. 200509293. 12/20/2006. Rec'd 12/21/2006.

LFR 2006e – LFR/Levine – Fricke (tn: 38490). Revised Draft Phase II Environmental Site Assessments Parcel #001-09301-01. 11/08/2006. Rec'd 11/17/2006.

RC 2006a – Russell City/M. Hartfield (tn: 38410). Petition for Amendment NO. 1, Russell City Energy Center. 11/17/2006. Rec'd 11/17/2006.

TRAFFIC AND TRANSPORTATION

Testimony of James Adams

SUMMARY OF CONCLUSIONS

The operation of the Russell City Energy Center (RCEC) would occasionally (approximately seven percent of the time) generate plumes that could be a substantial hazard to aircraft operations at the Hayward Executive Airport and would therefore be inconsistent with the Hayward Municipal Code (HMC) Section 10-6.35, which prohibits any land use that would be a hazard and endanger airport operations within the two mile wide airport approach zone area.

If the Energy Commission approves the amendment, staff's proposed new condition of certification, modification and/or deletions of the existing conditions would mitigate RCEC construction and operation impacts associated with ground traffic. The proposed mitigation related to the project's impact on aircraft operations around the Hayward Executive Airport would reduce the likelihood of aircraft flying over the RCEC, but it would not affect the plume velocity's potential safety hazard to aircraft should overflight occur. Staff will consider comments received on the Staff Assessment and may make changes to this analysis, and possibly the proposed conditions of certification.

INTRODUCTION

The Traffic and Transportation section of this Staff Assessment (SA) provides an analysis of the Russell City Energy Center's (RCEC) impact on the transportation systems in the vicinity of the project, and the project's compatibility with applicable traffic and transportation laws, ordinances, regulations, and standards (LORS). This analysis is focused on the changes in traffic and transportation since the project was approved by the Commission Decision (Decision) dated September 11, 2002. Staff has analyzed information in the Petition for Amendment No. 1 (Amendment) submitted by Russell City Energy Company, LLC (RCEC 2006a), and other sources to determine the RCEC's potential to have traffic and transportation impacts, and has considered mitigation measures that could reduce or eliminate the significance of those impacts. Staff is proposing a new condition of certification, a modification of one of the original conditions, and the removal of two other existing conditions.

The Amendment notes three changes in the baseline information for traffic and transportation when compared with the original application for certification (AFC), which was accepted by the Commission in July 2001: 1) primary access to the site during operation has changed from Enterprise Avenue to Depot Road; 2) construction workforce and vehicle traffic estimates have increased; and 3) new construction worker parking areas are available that may eliminate the need for worker bussing. In addition, staff has identified two new issues: 1) potential adverse impacts of RCEC generated thermal plumes on aircraft operations related to the Hayward Executive Airport; and 2) the reconstruction of the Interstate (I)-880 and State Route (SR)-92 interchange and associated changes to on-and-off ramps to local streets.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The table below lists all the updated LORS that are applicable to the traffic and transportation aspects of the proposed RCEC.

TRAFFIC AND TRANSPORTATION Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
Federal	
Federal Aviation Regulations (FAR) 77	Includes standards for determining obstructions in navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alteration. Also, provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace.
Code of Federal Regulations (CFR) Title 49, Subtitle B	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures), and provides safety measures for motor carriers and motor vehicles who operate on public highways.
State	
California Vehicle Code, Division 2, Chapter. 2.5, Div. 6, Chap. 7, Div. 13, Chap. 5, Div. 14.1, Chap. 1 & 2, Div. 14.8, Div. 15	Includes regulations pertaining to licensing, size, weight and load of vehicles operated on highways, safe operation of vehicles, and the transportation of hazardous materials.
California Streets and Highway Code, Division 1 & 2, Chapter 3 & Chapter 5.5	Includes regulations for the care and protection of State and County highways, and provisions for the issuance of written permits.
Local	
City of Hayward General Plan Circulation Element	Focuses on citywide issues concerning the roadway network, transit system, bicycle facilities, and pedestrian circulation to determine the most effective design possible while enhancing the community and protecting the environment.
City of Hayward Municipal Code Section 10-6.3.5	Describes use restrictions for any airport approach zone, turning zone or transition zone to avoid endangering the landing, takeoff or maneuvering of aircraft

SETTING

The new RCEC site is located about 1,300 feet north-northwest of the original site (See **TRAFFIC AND TRANSPORTATION Figure 1** – transportation figures are at the end of the analysis). The project site is located near a major highway transportation intersection involving I-880 and SR-92. Since certification of the original RCEC, average daily traffic counts have increased to 271,000 on I-880 and 109,000 on SR-92 and trucks comprise seven percent of the traffic (Caltrans 2005). The only other change in these highways is a new High Occupancy Vehicle (HOV) lane on the westbound side of SR-92. **TRAFFIC AND TRANSPORTATION Figure 2** illustrates the major roads, potential access routes, highways, and an airport in the project's vicinity. The roadways discussion below is based on the traffic and transportation section in the Amendment

(RCEC 2006a, Section 3.11.1.2) and traffic data from the City of Hayward Engineering-Transportation Department (City of Hayward 2007b).

ROADWAYS

The characteristics (existing conditions) of critical roadways in the project vicinity are displayed in **TRAFFIC AND TRANSPORTATION Table 2.**

Clawiter Road

Clawiter Road is a north-south two-lane road that provides access to SR-92. Access to the project site from SR-92 would be via Clawiter Road and Enterprise Avenue. Clawiter Road also intersects with West Winton Road to the north which provides access to I-880 to the east.

Enterprise Avenue

Enterprise Avenue is an east-west two-lane road that begins at Clawiter Road and ends in a cul-de-sac adjacent to the City of Hayward Water Pollution Control Facility and 0.2-mile east of the RCEC site. The project owner has indicated that Enterprise Avenue would provide access to the site during construction. According to City of Hayward staff, Enterprise Avenue carries less than 1,000 average daily vehicle trips though no traffic counts are available (City of Hayward 2007b).

Depot Road

Depot Road is an east-west two-to four-lane road that connects Hesperian Boulevard to the east with Clawiter Road and proceeds west for about a mile before terminating just west of Cabot Boulevard. Depot Road is just north of the RCEC site and would provide access during project operations

Industrial Boulevard

Industrial Boulevard is a southeast-northwest four-lane road that provides access to SR-92 and terminates at Clawiter Road.

TRAFFIC AND TRANSPORTATION Table 2
Characteristics of Critical Roadways in Project Vicinity

Name	Classification	Peak Design Capacity [a.3.]	Average Daily Traffic Volume [b, c.1.]	Truck Traffic [b, 2.] (Percent)	Peak Hour Volume [b, c. 4.]
Regional Roadway Segment					
SR-92 I-800 to Hesperian Boulevard	Freeway	14,400	109,000	7%	9,300
SR-92 Hesperian Boulevard to Clawiter Road	Freeway	14,400	99,000	7%	8,500
I-880 Winton to SR-92	Freeway	16,000	271,000	7%	16,900
I-880	Freeway	16,000	229,000	6.7%	14,900

SR-92 to Tennyson Road					
Local Roadways					
Clawiter Road Industrial Boulevard to SR-92 Westbound Ramp	Minor Arterial	1,600	18,600	12%	1,267
Clawiter Road SR-92 Westbound Ramp & SR-92 Eastbound Ramp	Minor Arterial	1,600	14,700	12%	1,114
Depot Road Dodge Avenue to Clawiter Road	Minor Arterial	1,600	8,400	12%	675
Depot Road Clawiter Road to Viking Street	Minor Arterial	1,600	10,600	12%	667
Industrial Boulevard Clawiter to Depot Roads	Major Arterial	3,200	10,600	12%	964
Industrial Boulevard Depot Road to SR-92	Major Arterial	3,200	16,300	12%	1,431

a. Vehicles/hour (both directions). Source: Highway Capacity Manual, Transportation Research Board (TRB), 2000
b. Source: State of California, Department of Transportation, 2005
c. Source: City of Hayward, Department of Public Works, Traffic Volumes:
1. ADT volumes are from 2005.
2. Truck percent is based on limited data; truck counts were only done on Clawiter Road. For planning purposes, the truck volumes recorded, 12 percent, have been applied to all industrial areas within the City of Hayward.
3. Vehicles are per hour per lane.
4. PM peak hour is 5-6 PM.

Level of Service

When evaluating a local transportation system, staff uses levels of service (LOS) measurements as the foundation on which to base its analysis. LOS measurements represent the flow of traffic. In general, LOS ranges from "A" with free flowing traffic, to "F" which is heavily congested with flow stopping frequently. The following roadway segments, that could be affected by RCEC traffic, operated at varying levels of service (LOS A to F) in 2005 based on peak hour volumes (RCEC 2006a, Table 3.11-1, pg. 3-149, City of Hayward 2007b):

I-880 (8-lane urban freeway)

- Winton Avenue to SR-92– LOS F
- SR-92 to Tennyson Road – LOS E

SR-92 (8-lane urban freeway)

- I-880 to Hesperian Boulevard– LOS C
- Hesperian Boulevard to Clawiter Road – LOS B
- Clawiter Road to San Mateo Bridge – LOS D

Clawiter Road (2-lane road)

- SR-92 Westbound Ramp – LOS C

- SR-92 Eastbound Ramp - LOS C
- Industrial Boulevard to SR-92 – LOS E

Industrial Boulevard (4-lane road)

- Clawiter Road to Depot Road – LOS A
- Depot Road and SR-92 – LOS A

Depot Road (2 lane road)

- Dodge Avenue to Clawiter Road – LOS A
- Clawiter Road to Viking Street – LOS A

Eden Landing Road (2 lane road)

- SR-92 to Arden Road– LOS A

Enterprise Avenue (2-lane road)

- - not available –

According to the City of Hayward Engineering-Transportation Division, all of the roads in the local area have a LOS of C or better, except Clawiter Road between Industrial Boulevard and SR-92 which is LOS E.

AIRPORTS

The RCEC site is located approximately 1.5 miles south of the Hayward Executive Airport and is within the airport's approach zoning plan area, which extends out approximately two miles from the airport runways (City of Hayward 1964). Airspace in the vicinity of the Hayward Executive Airport is impacted by the number of airports and high level of aircraft activity in the San Francisco Bay area. As a result, airspace over the Hayward airport is layered or "stacked" to provide a margin of safety for flights into and out of several area airports within a 25-mile radius of Hayward, including Oakland, San Jose, and San Francisco International Airports. To allow adequate separation of Hayward traffic from air traffic for other airports, as well as over-flights to other parts of California and beyond, the Hayward Executive Airport airspace only extends from the ground to 1,450 feet above ground level (AGL). Aircraft planning to takeoff, land, or maneuver in the vicinity of the Hayward airport operate primarily within that airspace (Hayward Executive Airport 2002).

Oakland International Airport is about six miles north, San Francisco International Airport is 15 miles west, and San Jose International Airport is 25 miles south of the project site.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Significance criteria are based on California Environmental Quality Act (CEQA) Guidelines, the CEQA Environmental Checklist (amended December 1, 1999) and on performance standards and thresholds established by interested agencies.

Staff believes that an impact is significant if the project results in:

- An increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- A level of service standard established by the county congestion management agency for designated roads or highways, is exceeded from impact of a proposed project either individually or cumulatively when combined with current and reasonably foreseeable planned projects;
- A substantial increase in hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Inadequate emergency access;
- Inadequate parking capacity;
- A significant hazard to the public or the environment through the transportation of hazardous material;
- A change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- An activity within any airport approach zone, airport turning zone or airport transition zone that could endanger the landing, take off or maneuvering of aircraft; and
- Any thermal plume with a velocity of 4.3 meters per second or greater within any airport approach zone, airport turning zone, or airport transition zone.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The following section describes potential traffic and transportation changes, and potential impacts, associated with the construction and operation of the RCEC. The section also provides an assessment of potential transportation-related safety impacts.

Project Construction

Traffic impact estimates for RCEC construction have increased compared with the AFC and are based on a single 7:00 AM to 7:00 PM shift for roadways adjacent to the project site. This peak hour analysis was used to provide a worst-case scenario for the impact of 650 daily workers during month 14 of the peak construction phase. This is substantially more than the 510 peak construction workers noted in the AFC.
Project construction is expected to begin in the Spring of 2008 and end during the Spring of 2010. Construction hours would generally occur from Monday through Friday. The delivery and haul-away of construction materials would also occur during the day. Truck scheduling would not differ much from that described in the AFC and would not significantly affect the traffic/truck mix along state highways (RCEC 2006a, pg. 3-152).

TRAFFIC AND TRANSPORTATION Table 3 presents a summary of the trip generation for the project construction phase. Construction traffic impacts to local and regional roads would be determined by the routes used by construction workers and delivery trucks when arriving and departing from the project site. The routes would not be different than originally envisioned with approximately 85 percent of all construction

traffic using SR-92 or I-880 to SR-92, and then exiting SR-92 via the on-and off-ramps at Clawiter Road (RCEC 2006a, pg. 3-158).

Caltrans is about to begin a major reconstruction of the existing SR-92/I-880 interchange that would affect I-880 from the Tennyson Road over-crossing to the Winton Avenue over-crossing, and affect SR-92 from the Mt. Eden over-crossing to Santa Clara Street. Caltrans has prepared a Transportation Management Plan to provide a comprehensive method of reducing traffic disruption and relieving congestion during the reconstruction project (Caltrans 2005). Staff has been advised that the project would be completed in mid-2011, and Caltrans does not plan to close any lanes during the day given the high volumes of traffic at this busy interchange (RCEC 2007a). If this plan is implemented, staff believes that existing traffic patterns on the affected sections of the freeways would not be adversely impacted.

TRAFFIC AND TRANSPORTATION Table 3
Trip Generation Summary--Construction Phase

	Average Daily Round Trips	Peak Daily Round Trips	Morning Peak Hour		Evening Peak Hour	
			In	Out	In	Out
Workers	290	585*	585	0	0	585
Delivery Trucks	14	27	0	0	0	0
Heavy Vehicles & Trucks	6	26	0	0	0	0
Total	310	638	585	0	0	585

Source: RCEC 2006a, Table 2.4-3, pg. 2-17
* Forecasted Number of Commuting Workers, RCEC 2006a, Table 3.11-4, pg. 3-157

Level of Service Changes

During the construction period, the traffic on Clawiter Road from Industrial Boulevard to SR-92 would deteriorate from LOS E to F. Since this is unacceptable according to the City of Hayward's LOS standards, Condition of Certification **TRANS-1** (construction traffic control plan) would ensure that construction traffic would not use Clawiter Road or other local roads during peak AM/PM traffic periods. Given several options for reaching the site from I-880 and SR-92 (Hesperian Boulevard, West Winton Avenue, Clawiter Road), staff believes project related construction traffic would not degrade existing LOS.

Parking

As noted earlier, new construction worker parking areas are proposed (see **TRAFFIC AND TRANSPORTATION Figure 2**). One area is located on the southwest corner of the project site and a second area is on the north side of Enterprise Avenue about 0.25-mile west of its intersection with Clawiter Road. The third area is on the south side of Enterprise Avenue at the intersection with Whitesell Street. The proposed six acres of parking area would allow construction workers to park and walk to the RCEC site (RCEC 2006a, pg. 1-3). The project owner is expected to enforce a policy that all project-related parking occurs in designated parking areas; therefore, construction related traffic is not expected to impact the availability of parking in the area. Staff agrees with the proponent's traffic consultant that the parking areas would be adequate for project construction (RCEC 2007d).

Parking areas were addressed in Condition of Certification **TRANS-2** of the Commission's Decision. That condition required the development of an off-site construction employee-parking program designed to reduce the number of trips in the project vicinity. It required that the location and number of parking spaces available off-site be adequate for peak construction employees, the number of busses and bus capacity be adequate to shuttle peak construction employees to and from the site, and the hours of operation for the shuttle bus pick up and drop off times are generally outside the adjacent street peak hours. The project owner has requested that this condition be deleted.

Staff believes that reducing the number of trips in the project vicinity as required in the existing Condition of Certification **TRANS-2** would still be appropriate. However, limiting construction traffic to off-peak periods, as required by the existing Condition of Certification **TRANS-1,** would prevent significant degradation of levels of service on local roads. In addition, given the location of the new parking areas that would allow construction workers to walk to the project site, a bussing option is not necessary. Staff recommends that the Commission delete Condition of Certification **TRANS-2**.

Linear Facilities

Given the change in project location, the natural gas pipeline would be placed on the north side of Depot Road and would proceed east about 4,000 feet until reaching an existing PG&E line in the Union Pacific Railroad right of way. The potable water and sewer lines would connect the project and the City of Hayward Water Pollution Control Facility and would proceed south and east along a planned westerly extension of Enterprise Avenue. There would be some short term traffic impacts when installing the water and natural gas pipelines. The owner should obtain and comply with all necessary encroachment permits from City of Hayward Public Works Division for any construction within public rights-of-way. Staff has proposed a new Condition of Certification **TRANS-9** to ensure compliance with relevant encroachment permit requirements.

PROJECT OPERATION

Aviation Safety

Staff briefly mentioned the Hayward Executive Airport in the Final Staff Assessment (FSA) in June, 2002 in the original RCEC proceeding. It noted that the runway is aligned with a northwest to southeast bearing and aircraft will be expected to approach from these two directions and will not conflict with the proposed RCEC facility (CEC 2002a). Unfortunately, this statement was not accurate and given the experience with the Blythe power plants as described below, staff performs a much more rigorous analysis that focuses on potential impacts of plumes on aircraft operations within two to three miles of an airport.

In 2000, staff reviewed an Application for Certification for the Blythe Energy Project, a 500 MW power plant that would be built about one mile east of the Blythe Airport on the extended runway centerline of the primary runway. Staff expressed a concern in the Traffic and Transportation section of the 2001 FSA about the small separation (168 feet) between the top of the heat recovery steam generator (HRSG) exhaust stacks, and

aircraft on an instrument approach to the primary runway. In March of 2001, the Energy Commission issued a decision to grant a permit to construct the facility. After the facility became operational in 2003, staff received complaints from pilots who experienced moderate to severe turbulence from the plumes emitted from the cooling towers. Subsequently, staff developed a more rigorous plume behavior analysis for both HRSG and cooling tower plumes, and recommended that several mitigation measures be implemented to discourage pilots from flying over the Blythe power plant.

Staff also analyzed potential aviation safety impacts related to the proposed Blythe Energy Project Phase II in the 2005 FSA. The Phase II facility would be built adjacent to the existing Blythe facility, though not on the primary runway extended center line. Staff concurred with the Caltrans Aeronautics (a division within the California Department of Transportation) conclusion that it is inappropriate to build another power plant near the Blythe Airport that will compound the existing problem with additional plume turbulence. However, the Commission felt that with additional mitigation measures in place (e. g., changing the traffic pattern and designating a calm wind runway), the construction and operation of the Phase II facility would be appropriate.

There are several agencies that have influence or jurisdiction regarding airports and overlying airspace. On the federal level, the Federal Aviation Regulation (FAR), Part 77 establishes standards for determining obstructions in navigable airspace and sets forth requirements for notification to the FAA of proposed construction. Caltrans Aeronautics is a state agency whose principal purpose is to further and protect the public interest in aeronautics by, among other things, fostering and promoting safety in and around airports (California Public Utilities Code 2006). Caltrans has also published an airport land use compatibility planning handbook that encourages compatible land uses near airports, and environmental mitigation measures to prevent incompatible land use encroachment (Caltrans 2007). State law requires, with certain exceptions, that any county that has an airport that is operated for the benefit of the public shall establish an airport land use commission that would serve as an advisory body to the applicable city or county (California Public Utilities Code 2006). The seven-member Alameda Airport Land Use Commission was created in 1971 and is currently updating its 1986 Airport Land Use Policy Plan for airports in Alameda County.

Staff has also reviewed a 2004 safety advisory circular [AC 139-05(0)], prepared by the Australian Government Civil Aviation Safety Authority (CASA), that noted “aviation authorities have established that an exhaust plume with a vertical velocity in excess of 4.3 meters per second (m/s) may cause damage to an aircraft airframe or upset an aircraft when flying at low levels” (Australian Civil Aviation Safety Authority 2004). As a result, CASA requires a proponent of a facility that generates an exhaust plume with this velocity within an airport’s Obstacle Limitation Surface (FAA equivalent = Navigable Airspace), or at 110 meters (351 feet) AGL anywhere else, to be assessed for the potential hazard to aircraft operations. The Australian State of Queensland has a planning policy for avoiding activities or developments that could adversely affect operational airspace. A development that would incorporate a stack or vent that would emit a gaseous plume with a velocity exceeding 4.3 m/s is inappropriate unless measures are included to prevent such a plume from intruding into operational airspace (State of Queensland 2002).

As noted earlier, the RCEC site is located approximately 1.5 miles south-southwest of the Hayward Executive Airport and is within the airport approach zoning plan area. Aircraft operating in the Hayward airport airspace must be in contact with the air traffic control (ATC) tower when it is in operation. However, the Hayward tower only operates from 7:00 am to 9:00 pm daily. During all other times, the airspace reverts to Class E airspace, which requires only those aircraft that are conducting instrument flights to remain in contact with ATC facilities, such as San Francisco Bay Approach Control, Oakland ATC tower, or Oakland Air Route Traffic Control Center. Other aircraft, operating under visual flight rules (VFR) are not required to be in radio communication with any ATC facility, and their flight paths need not conform to published instrument approach or departure patterns. Under VFR rules, aircraft are generally allowed to enter the standard pattern from any direction, provided it does not interfere with other aircraft or violate local noise abatement restrictions. The airport has two runways: Runway 10 Right (R)/28 Left (L) (5694 x 150 feet) and Runway 10L/28 R (3107 x 75 feet). The runways are parallel with one another and have a northwest/southeast orientation. Runway 10L-28R is closed when the tower is not in operation, further directing any departures and arrivals to the south and west (Hayward Executive Airport 2002).

The airport has more than 10,000 monthly operations such as take offs, landings, and en-route flights (City of Hayward 2007c), and a FAA terminal data report shows that operations will continue to increase thoroughout the forecast period ending in the year 2025 (FAA 2006a). There are almost 500 aircraft based at the Hayward Airport and most (442) are single engine lightweight airplanes. There are also 19 helicopters based at the airport. The air traffic pattern extends out a mile-and-a-half from the runways depending on how many aircraft are in the pattern, and primarily utilizes the area west and south of the airport to accommodate noise abatement procedures. The City of Hayward has provided staff with aircraft tracking diagrams for the month of April 2007 that show over 40 aircraft (including single engine aircraft and helicopters) flew over or within 150 horizontal meters (480 feet) of the RCEC site. Flight elevations ranged from 470 feet above ground level (AGL) to 1,000 feet AGL. Normal traffic pattern elevation is 600 to 800 feet AGL which provides sufficient separation from Oakland Airport controlled airspace beginning at 1,450 feet AGL (Hayward Executive Airport 2007). The RCEC would generate thermal plumes from two heat recovery steam generator (HRSG) stacks (145 feet tall) and a nine-cell cooling tower (64 feet tall). Under certain meteorological conditions (dead calm wind) and cool temperatures (38ºF), the plumes would maintain significant velocity and integrity as they gain elevation.

Unlike Australia and some countries in Europe, the USEPA has not approved air dispersion models that can predict vertical plume velocity. In a statistical analysis of aircraft overflight of industrial plumes, FAA safety analysts using a variety of data sources going back almost thirty years, concluded that, although the potential for risk is "acceptably small (10^{-9} or less), intentional and/or inadvertent overflight of industrial plumes at low altitudes (less than 1,000 feet above ground) during high velocity operation of the facility (*producing the plume; italics added*) could possibly result in aircraft upset and a resultant incident or accident". The agency report also determined that low, close-in operations at small to medium size airports by general aviation aircraft, particularly aircraft under 12,500 pounds and those in the Light Sport Aircraft category, would be of greatest potential concern [FAA(b), Section 4, bullet 3, p. 15].

The analysis also made recommendations to further lower the risk associated with the overflight of vertical plumes. This included amending FAA Order 7400.2 to consider a plume generating facility a hazard to navigation when expected flights pass less than 1,000 feet above the top of the object. FAA safety analysts have accepted the information contained in the CASA advisory noted earlier as a valid representation of hazardous exhaust velocities (FAA 2006b). Although the FAA statistical analysis determined the risk of thermal plumes to be acceptably low, given the particular circumstances in Hayward, staff believes the RCEC plumes could be a substantial hazard to aircraft flying overhead at low altitudes within the transition zone.

Staff has applied the 4.3 m/s criterion as a minimum threshold determination for a potential aviation safety hazard on aircraft flying over a plume generating power plant. As discussed in **TRAFFIC AND TRANSPORTATION Appendix 1**, this is an average velocity that is less than the peak plume velocity. Staff has conducted a vertical plume velocity analysis that predicts plume velocities for the HRSG stack and the cooling tower . **TRAFFIC AND TRANSPORTATION Table 4** compares average thermal plume velocities at various heights and temperatures. The heights and velocities at 500, 600 and 800 feet are in bold because they are the heights of the normal air traffic pattern. The temperatures for the HRSGs and the cooling tower were based on data submitted by the project owner (see **TRAFFIC AND TRANSPORTATION Appendix 1**). At 600 feet AGL, thermal plume velocities are predicted to be greater than the 4.3 m/s threshold for both the HRSGs and the cooling tower at the selected temperatures. The cooling tower plume velocity is predicted to exceed the 4.3 m/s threshold at 1,100 feet AGL when the temperature is 38ºF, and 600 feet AGL at 68ºF.

TRAFFIC AND TRANSPORTATION Table 4
Plume Velocity

	Gas Turbine/HRSG Plume Velocity (m/s)		Cooling Tower Plume Velocity (m/s)	
Ambient Air Temperature				
Height (ft)	**38°F**	**59°F**	**38°F**	**68°F**
300	10.18	9.88	8.00	7.64
400	7.28	6.99	6.67	5.84
500	**6.13**	**5.85**	**5.94**	**4.91**
600	**5.48**	**5.22**	**5.46**	**4.34**
700	5.05	4.80	5.12	3.96
800	**4.73**	**4.49**	**4.84**	**3.68**
900	4.49	4.26	4.63	3.47
1,000	4.29	4.06	4.44	3.30
1,100	4.12	3.90	4.29	3.17
1,200	3.98	3.77	4.15	3.05

Source: **TRAFFIC AND TRANSPORTATION Appendix-1**, Table 2.

***** Typical height for helicopter operations.

The project owner has also provided a separate plume velocity analysis, revised after staff sponsored data response and issue workshops, that was prepared by Katestone Environmental (Katestone 2007) based on a proprietary model developed from the "Spillane approach" as presented in the "Aviation Safety and Buoyant Plumes" paper (Best 2003). The final report was not completed and docketed at the time of this analysis. Katestone was still addressing staff and project owner comments on the docketed draft report. Staff's calculations and the Katestone report's calm wind values

match very well. Staff considers the methods and results provided by the Katestone report for calm conditions to be reasonable**.** A comparison of the two velocity analyses are provided in **Table 3** of staff's **TRAFFIC AND TRANSPORTATION-Appendix 1.**

The Katestone report also considers the impact of wind on the vertical velocity and frequency of velocities at given heights. Staff cannot adequately review those results without a copy of the Katestone model, so this staff analysis does not provide comment on that portion of the Katestone analysis other than to note that the wind speeds noted to be used in the model appear reasonably conservative. Table 5 of the Katestone analysis shows critical plume heights (4.3 m/s) during a realistic wind scenario, based on one-year meteorological data from the Union City Meteorological Station for the year 1994. The Katestone analysis predicted the 4.3 m/s plumes to be below 174 meters (571 feet) 99.95 percent of the time for the HRSGs. However, the critical velocity would be encountered at about 121 meters (400 feet) nine percent of the time (Katestone 2007) (see **TRAFFIC AND TRANSPORTATION Table 5**). This is an elevation used by helicopters and aircraft executing a missed approach from RY 10R/28L. The critical velocity for the cooling towers is predicted to be below 96 meters (315 feet) for 99.95 percent of the time. The Katestone analysis also provided the estimated horizontal extent of the plume at the height when the average vertical velocity of the plume falls below the 4.3 m/s threshold. The plume width is estimated at 89 meters (292 feet) in diameter for the HRSGs and 158 meters (518 feet) for the nine-cell cooling tower.

Staff's statistical analysis of Union City meteorological data shows that ambient conditions (temperatures of 60ºF or less, and wind speeds of less than 1 m/s) conducive to the formation of thermal plume velocities of concern would occur on average approximately seven percent of the time (see **TRAFFIC AND TRANSPORTATION Appendix-1, Table 7**). Although the thermal plume danger conditions are low, staff believes the RCEC plumes could pose a significant risk and hazard to pilots because they would occur in a constrained airspace that frequently requires pilots to maneuver at low altitudes. Given the experience at the Blythe power plant where aircraft encountered severe turbulence when flying over the cooling tower at 1,000 feet AGL or lower (Watkins 2003, Magana 2004, Nordberg 2004), staff is concerned that aircraft could experience similar turbulence when flying over the RCEC at routine traffic pattern elevations. The cooling tower vertical plume average velocities are calculated to be somewhat higher for RCEC than Blythe, since the heat load for the RCEC cooling tower is somewhat higher, the initial stack height and velocity are both higher for the RCEC cooling tower, and the RCEC cooling tower would have additional thermal buoyancy since it is a plume abated tower (see **TRAFFIC AND TRANSPORTATION Appendix 1-Table 6**). The Blythe cooling tower plume velocity at 1,000 feet at 38ºF is predicted to be 4 m/s, which is less than the 4.4 m/s predicted velocity for RCEC cooling tower plumes at 38ºF at 1,000 feet AGL.

TRAFFIC AND TRANSPORTATION Table 5

Critical plume height for the proposed RCEC and the proportion of the simulation year that the critical height is exceeded for a single and merged plume.

Percent of time (%)	TAPM results		Katestone methodology results	
	Single GT_1 critical plume height (meters)	Single CT_2 critical plume height (meters)	Two merged GT_1 critical plume height (meters)	Nine merged CT_2 critical plume height (meters)
100	53	13	55	22
90	58	25	67	29
80	59	29	69	31
70	59	29	74	35
60	60	29	76	37
50	65	30	82	40
40	66	30	85	44
30	71	35	93	52
20	73	36	104	58
10	99	37	119	64
9	100	41	121	65
8	101	41	123	66
7	102	42	125	68
6	103	42	128	69
5	104	42	130	71
4	105	42	132	73
3	107	47	136	75
2	110	48	141	80
1	130	67	149	87
0.5	133	68	158	91
0.3	134	69	164	92
0.2	135	70	167	92
0.1	136	71	172	95
0.05	159	71	174	96

Note 1GT – Gas turbine
Note 2CT – Cooling tower
Source: *Plume Vertical Velocity Assessment of a Proposed Gas-Fired Station at Russell City Energy Center*, Katestone Environmental, Draft, Table 5, June 2007.

The Blythe II Commission Decision provides a description of the effect thermal plumes can have on aircraft.

> Under worst-case conditions (solo pilot, small plane, flying at or below approach altitude, cool winter night or early morning with little or no wind, power plant at full-load), unexpected severe turbulence can cause sudden and significant aircraft position changes (such as 90 degree rolls to the left or right). High angle turns at low speed will result in a loss of aircraft lift and altitude. In addition, sudden aircraft position changes at night can result in pilot vertigo – the loss of reference to the earth's horizon. This can result in pilots' losing their sense of what is up and what is down. At night, this can easily lead to an aircraft accident. This problem is exacerbated if the pilot is inexperienced or the aircraft is experiencing emergency conditions. (Blythe Energy Project Phase II, Commission Decision, December 2005, pg. 178).

Unlike the situation at the Blythe Airport where there are approximately 2,100 aircraft operations a month, the Hayward Executive Airport has over 10,000 operations a month. Given the rural setting and sparsely populated area surrounding Blythe Airport, aircraft have more flexibility in the type of approaches and departures that are available. In addition, Blythe Airport did not have helicopter operations. According to the aircraft tracking data provided by the City of Hayward, helicopters at the Hayward facility do fly at lower elevations than fixed wing aircraft (400-500 AGL). **TRAFFIC AND TRANSPORTATION Figure 3** shows the arrival and departure routes for helicopters in the Hayward traffic pattern. The arrival route area is southwest of the airport where the RCEC site is located. As noted in **TRAFFIC AND TRANSPORTATION Table 4**, velocities for the HRSGs and cooling tower at 500 feet AGL are all above the 4.3 m/s threshold at the selected temperatures. There are also hazards (e.g. radio towers) and noise restrictions to the north, east and south of the Hayward Airport that complicate aircraft operations. Another restriction on aircraft operations involves the desire of pilots to stay well below the 1,450 feet AGL boundary of Oakland Center's controlled airspace.

As noted above in **TRAFFIC AND TRANSPORTATION Table 1** of this analysis, the Federal Aviation Regulations (FAR), Part 77 establishes standards for determining obstructions in navigable airspace and sets forth requirements for notification to the FAA of proposed construction. Notification is also required if the structure or obstruction is more than a specified height and falls within any restricted airspace in the approach to airports. FAA Form 7460-1 is normally required when new or altered structures are within an airport control zone; which is generally within a two to three-mile radius. For airports with runways longer than 3,200 feet, the restricted air space starts at 200 feet in elevation at 20,000 feet from an airport. The project owner submitted a Form 7460-1 to the FAA (accepted on March 7, 2007) but it did not include any discussion about plumes generated by the RCEC. In discussions with the FAA on February 23, 2007, the project owner was told that Form 7460-1 involves review of solid structures only, and is not for documenting exhaust discharges (RCEC 2007c). Consequently, the FAA released a Determination of No Hazard to Air Navigation regarding the RCEC on March 26, 2007. The determination did not consider the plumes that would be generated by the project and potential adverse impacts on aircraft safety.

The FAA can also perform studies on existing and proposed objects and activities on and in the vicinity of public-use airports. These objects and activities are not limited to

obstructions to air navigation but can focus on the efficient use of an airport and the safety of persons and property on the ground. As a result of these studies, the FAA may resist, oppose, or recommend against the presence of objects or activities in the vicinity of a public-use airport that conflict with an airport planning or design standard or recommendation. For example, an FAA study could conclude whether an object or activity on or in the vicinity of an airport is objectionable (FAA 2002). The FAA can also comment on proposed land uses when appropriate.

Representatives of the Western Region of the FAA, the Alameda County Airport Land Use Commission, Caltrans Aeronautics, and the California Pilots Association have expressed concern about the RCEC's potential to impact Hayward Executive Airport operations and plan on participating in the Energy Commission's review of the proposed amendment. Staff will provide these agencies and organizations with copies of the Staff Assessment for their review and comment.

Section 10-6.35 of the Hayward Municipal Code states that "no use may be made of land within any airport approach zone, airport turning zone, or airport transition zone… that would endanger the landing, takeoff or maneuvering of aircraft." Staff believes that RCEC generated thermal plumes would endanger aircraft flying over the power plant at normal traffic pattern elevation.

Staff has reviewed engineering changes for mitigating cooling tower plume velocities, such as increasing the size of the cones on the top of the cooling towers, which could reduce the velocity of the plume. However, this mitigation would not substantially reduce cooling tower plume velocity (Aspen 2007c).

In the Blythe case, staff did not have the modeling capability to predict plume velocity and did not identify the adverse impact on aircraft until the plant was operating and pilots complained about turbulence. Staff concluded that the cooling tower plumes were the main cause of the turbulence and several mitigation measures were implemented. These measures included: having the Blythe Airport manager request the FAA to issue a Notice to Airman (NOTAM) advising pilots to avoid low altitude (1,000 feet AGL) overflight of the plant; shut down of an instrument approach that took aircraft directly over the power plant; revising the Phoenix and Los Angeles Sectional Charts to include a marker showing where the plant is located and adding a recommendation about avoiding overflight; and requiring a new airport weather observing system equipment be installed that advised pilots, as they approached the airport, to avoid direct overflight. The mitigation measures were "after the fact" mitigation and less than ideal. CEQA requires that significant adverse impacts be avoided where possible and the HMC prohibits uses within the airport approach zone that would endanger aircraft.

Mitigating an adverse impact should be done during the analysis phase prior to making a recommendation to the Commission that a permit be granted to build a power plant. Absent any engineering or technical fixes to mitigate the RCEC plumes by reducing velocities so that they would not pose a hazard to aircraft safety, staff believes the proposed power plant would pose an unacceptable hazard to aircraft operations, and would not comply with HMC Section 10-6.35. The Hayward Airport should not bear the burden of having a power plant built within the airport approach zone that would be a

hazard to airport operations and would exacerbate an already complex aviation environment.

The Hayward Airport has been operating for over 40 years and the intent of HMC Section 10-6.35 is to protect the airport from uses that would be incompatible with airport operations. Oakland Center controlled airspace begins at 1,450 feet above the Hayward Airport. Therefore, the recommendation in the 2006 FAA Safety risk analysis (noted earlier) that aircraft stay above 1,000 feet AGL when flying over plume generating industrial facilities is not feasible in this case, because pilots want greater separation from Oakland Center controlled airspace. It is important to reiterate the fact that the traffic pattern in the Hayward Airport area is 600 to 800 feet AGL, and even lower for helicopters.

Should the Energy Commission find the risk to Hayward air traffic acceptable, staff is proposing Condition of Certification **TRANS-10**, which would discourage pilots from flying over or in close proximity to the RCEC. This would include having the FAA issue a Notice to Airman (NOTAM) advising pilots to avoid overflight of the plant, and revising any instrument approach that currently directs aircraft over the power plant site at low elevation. The proposed mitigation related to the project's impact on aircraft operations around the Hayward Executive Airport would reduce the likelihood of aircraft flying over the RCEC, but it would not affect the plume velocity's potential safety hazard to aircraft should overflight occur, and the impact would remain significant.

Hazardous Materials Transport

During operation, trucks would periodically deliver and haul away various hazardous materials and waste, and there would be regular deliveries of aqueous ammonia via Depot Road instead of Enterprise Avenue as originally planned. Depot Road is a designated truck route that would provide access to SR-92 via Clawiter Road. Staff believes this is an appropriate route that primarily goes through industrial or commercial areas. For more information, see the **HAZARDOUS MATERIALS** section of this staff assessment.

CUMULATIVE IMPACTS AND MITIGATION

The proposed Eastshore Energy Center (EEC) site is about 0.5 miles east of the RCEC and is located near the intersection of Clawiter and Depot Roads. The RCEC proponent notes that the RCEC peak construction period may overlap with the EEC project's final construction phase (RCEC 2006a, pg. 3-161). The start of construction of the EEC is scheduled for early 2008. However, the status of the EEC is unclear since the City of Hayward determined on March 13, 2007 that the project is not consistent with Hayward's Industrial Zoning District and General Plan. In addition, in a revised scheduling order, the Energy Commission directed the parties (Commission staff and EEC applicant) to consider input from the Russell City proponent regarding the feasibility of one site for both projects, potential cumulative impacts of two sites, and any other relevant information.

The RCEC proponent has analyzed the potential cumulative impact with EEC and has identified two roadway segments where the LOS would deteriorate: SR-92 between I-

880 and Hesperian Boulevard (for the simultaneous peak construction only), and Clawiter Road between SR-92 westbound and eastbound ramps (for both simultaneous peak construction and RCEC peak overlap with average activity at the EEC site). Simultaneous peak construction activity would result in 797 peak daily trips while RCEC peak with EEC average activity would result in 697 peak trips (RCEC 2006a, Table 3.11-7, pg. 3-161). Staff believes this is a reasonable analysis and agrees with the proponent that the combined RCEC and EEC construction traffic on the identified Clawiter roadway segment could cause a cumulatively significant degradation of LOS (E to F).

The EEC would also generate thermal plumes from 14 natural gas-fired reciprocating engines. The 14 stacks for Eastshore extend approximately 388 feet from end to end. Plume velocities are predicted to be 4.3 m/s at between 400-500 feet AGL. If the facility is built as proposed, the EEC could be another potential safety hazard in the general area of the RCEC, and would further restrict Hayward aircraft operations. Staff has not completed the analysis of the EEC.

Staff has been advised by City of Hayward staff that there are no other projects proposed or in the planning stage in the general area around the RCEC site. However, City staff believes the I-880/SR-92 interchange project may impact traffic movement associated with RCEC construction (City of Hayward 2007c). With implementation of the construction traffic control plan as required in the original Condition of Certification **TRANS-1**, the cumulative traffic impact would be less than significant.

Staff has considered the minority populations (as identified in **SOCIOECONOMICS Figure 1**) and low income populations in its impact analysis. With mitigation, there are no significant adverse traffic and transportation cumulative impacts, and therefore, no environmental justice issues.

COMPLIANCE WITH LORS

TRAFFIC AND TRANSPORTATION Table 6 lists applicable LORS and whether the RCEC is consistent with the relevant provisions. The RCEC would be consistent with all federal and state LORS related to ground transportation and the City of Hayward Circulation Element of the General plan. However, the project is inconsistent with Section 6-10.35 of the HMC because project-related plumes could endanger aircraft flying over the RCEC at normal pattern altitude or higher elevations. Staff has reviewed tracking data that show aircraft do fly over the site. The majority of aircraft based at Hayward Executive Airport are single engine light weight planes that would be particularly vulnerable to thermal plumes with a velocity of 4.3 m/s or greater. The RCEC would be a new hazard to aviation safety that would adversely impact airport operations. Staff has been advised that the City of Hayward has not issued any variances in recent years for land uses regarding safety issues within the airport approach zone area (City of Hayward 2007d).

TRAFFIC AND TRANSPORTATION Table 6
Compliance with LORS

Applicable LORS	Provision	Consistency
Federal		
Federal Aviation Regulations (FAR) 77	Establishes standards for determining obstructions in navigable airspace and sets forth requirements for notification to the FAA of proposed construction.	The FAA has made a determination that the project's physical structures would cause no hazard to air navigation.
Code of Federal Regulations (CFR) Title 49, Subtitle B.	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures), and provides safety measures for motor carriers and motor vehicles who operate on public highways.	Enforcement is conducted by state and local law enforcement agencies, and through state agency licensing and ministerial
State		
California Vehicle Code, Division 2, Chapter. 2.5, Div. 6, Chap. 7, Div. 13, Chap. 5, Div. 14.1, Chap. 1 & 2, Div. 14.8, Div. 15	Includes regulations pertaining to licensing, size, weight and load upon vehicles operated on highways, safe operation of vehicles, and the transportation of hazardous materials.	Enforcement is provided by state and local law enforcement agencies, and through ministerial state agency licensing and permitting, and/or local agency permitting.
California Streets and Highway Code, Division 1 & 2, Chapter 3 & Chapter 5.5	Includes regulations for the care and protection of State and County highways, and provisions for the issuance of written permits.	Enforcement is provided by state and local law enforcement, and through ministerial state agency licensing and permitting, and/or local agency permitting. Condition of Certification **TRANS-2** requires encroachment permits for any work in public rights-of-way.
Local		
City of Hayward General Plan Circulation Element.	Describes the transportation needs and issues within the City, including the circulation system's design elements, operating characteristics and limits, and criteria for locating, designing and operating the transportation system.	Project construction related traffic would reduce the level of service on one segment of Clawiter Road to LOS F which is deemed unacceptable by the Circulation Element. The existing **TRANS-1** would ensure that this road segment is not used during peak traffic periods throughout RCEC construction.
City of Hayward Municipal Code (HMC) Section 10-6.35	Describes use restrictions for any airport approach zone, turning zone or transition zone to avoid endangering the landing, takeoff or maneuvering of aircraft.	Project generated plumes, under certain meteorological conditions, would endanger aircraft flying over the RCEC at this site at normal pattern altitude or higher elevations. This project would be an inconsistent use pursuant to this code section.

NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any traffic and transportation benefits from the RCEC to date.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has reviewed the City of Hayward's letter of April 19, 2007, and understands that the City is not concerned about the RCEC being within the Hayward Airport Airspace Drawing boundaries, and the project site is not in direct alignment of any major approach routes. The City also believes the RCEC stacks would not exceed the obstacle-free zone height limitations established by the FAA. In addition, the City would rely on the FAA's review of the plume issue. As noted earlier, the FAA did not consider the plumes relevant in the context of the Part 77 review, nor did they make any recommendations regarding proper notification to pilots or a modification of the City's helicopter approach path from the west. Staff believes the FAA review process to date is incomplete and the RCEC generated plume, particularly the combined exhaust from the cooling tower, would be a significant adverse aviation safety impact on aircraft flying over the plant at 1,100 feet or lower. Staff will be seeking further input from the FAA, and input from the Alameda County Airport Land Use Commission, Caltrans Aeronautics, and California Pilots Association after the Staff Assessment is published.

CONCLUSIONS AND RECOMMENDATIONS

During the operational phase when the wind is calm and the temperature is below 59ºF, thermal plumes generated by the two HRSG stacks would occasionally (approximately seven percent of the time) create significant velocities at 800 feet AGL; 4.7 m/s at 38ºF, and 4.5 m/s at 59ºF. Cooling tower velocities at 600 feet AGL would also be significant; 5.5 m/s at 38ºF and 4.3 m/s at 68ºF. Cooling tower plume velocity would be 4.3 m/s at 1,100 feet AGL when the wind is calm and the temperature is 38ºF. As noted earlier, these are average velocities and peak velocities at the plume centerline would be higher.

These plumes could cause severe turbulence as aircraft fly over the RCEC at these elevations. Over 40 aircraft in the Hayward Executive Airport traffic zone flew over or close to the project site during April 2007. Staff believes that the RCEC generated plumes would be a substantial hazard to aircraft operations. The plume velocities exceed staff's 4.3 m/s threshold for a potential aviation hazard at traffic pattern altitude. Aircraft currently fly over the RCEC site at 600-800 feet AGL (helicopters go lower), and the 1,450 feet ceiling imposed by Oakland Center constrains pilots from using higher elevations. The HMC Section 10-6.35 prohibits any land use that would be a hazard to airport operations within the two mile wide airport approach zone area. Staff has not identified any engineering designs that would reduce plume velocities from the cooling tower.

During the construction phase, increased roadway demand resulting from the daily movement of workers and materials is expected to increase traffic volumes and degrade the level of service from LOS E to F on Clawiter Road from Industrial Boulevard to SR-92. The traffic would remain at existing levels of service for the other local roads. Staff

believes that limiting construction traffic to off peak periods as required by the existing Condition of Certification **TRANS-1** would mitigate the expected adverse construction traffic impacts on Clawiter Road.

The addition of RCEC construction traffic and the Eastshore Energy Center construction traffic to the roadways and highways could result in a significant cumulative impact. Condition of Certification **TRANS-1** requires construction workers' arrival/departure times to occur outside of peak traffic periods. The combined traffic impacts of the two projects would not be cumulatively significant if the design and implementation of the construction traffic control plan is coordinated with the City of Hayward Engineering and Transportation Division and Caltrans.

Staff's proposed new condition of certification, modification and/or deletions of the existing conditions would mitigate impacts associated with ground traffic. If the Energy Commission approves the RCEC amendment, staff recommends that it adopt the following modifications to the original conditions of certification. The proposed mitigation related to the project's impact on aircraft operations around the Hayward Executive Airport would reduce the likelihood of aircraft flying over the RCEC, but it would not affect the plume velocity's potential safety hazard to aircraft should overflight occur (see proposed Condition of Certification **TRANS-10**), and the impact would remain significant. Staff will consider comments received on the Staff Assessment and may make changes to this analysis, and possibly the proposed conditions of certification.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Given the changes in traffic and transportation information since the RCEC was permitted and a new project site was selected, staff is proposing a modification to one condition of certification (**TRANS- 6**), two new conditions (**TRANS-9 & 10)**, and the removal of conditions **TRANS-2, 3, 5, 7 & 8**. New text is underlined and strikethrough was used on conditions proposed for deletion.

The project owner is requesting that Conditions of Certification **TRANS 2, 4,** and **5** be deleted. Given the new project site, the improvements along Whitesell Street are no longer necessary. As noted earlier, the RCEC proponent has requested that the original Condition of Certification **TRANS-2** be deleted since bussing workers to the site would no longer be necessary. Staff believes that Condition of Certification **TRANS-4** may still be needed depending on the City of Hayward's requirements for improving Enterprise Avenue prior to project construction. Staff is not opposed to deleting Conditions of Certification **TRANS-2** and **5**.

TRANS-1 The project owner shall develop a construction traffic control and transportation demand implementation program that limits construction-period truck and commute traffic to off-peak periods in coordination with the City of Hayward and Caltrans. Traffic associated with construction of the RCEC shall be mitigated by avoiding peak transportation hours associated with the area, including peak work hours for Gillig Corporation, Berkeley Farms Incorporated, and other major employers in the area. In addition, the

use of the railroad spur shall not block traffic during a.m. or p.m. peak hours. Specifically, this plan shall include the following restrictions on construction traffic:

- Establish construction work hours outside of the peak traffic periods to ensure that construction workforce traffic occurs during off-peak hours, except in situations where schedule or construction activities require travel during peak hours, in which case workers will be directed to 217 routes that will not deteriorate the peak hour level of service below the City of Hayward's LOS D standard;
- Schedule heavy vehicle equipment and building material deliveries as well as the movement of materials and equipment from laydown areas to occur during off-peak hours;
- Route all heavy vehicles and vehicles transporting hazardous materials as follows: from SR 92 exit northbound at Clawiter Road, turn left at Enterprise Avenue, and enter the Russell City Energy Center shortly after passing Whitesell Street; and
- During the construction phase (every 4 months), monitor and report the turning movements for the intersection at Enterprise Avenue and Clawiter Road during the A.M. (7:30 to 8:30 a.m.) and P.M. (4:30 to 5:30 p.m.) peak hours to confirm construction trip generation rates. The construction traffic control and transportation demand implementation program shall also include the following restrictions on construction traffic addressing the following issues for linear facilities:
- Timing of pipeline construction (all pipeline construction affecting local roads shall take place outside the peak traffic periods to avoid traffic flow disruptions);
- Signing, lighting, and traffic control device placement;
- Temporary travel lane closures;
- Maintaining access to adjacent residential and commercial properties; and
- Emergency access.

Verification: At least 30 days prior to start of site preparation or earth moving activities, the project owner shall provide to the City of Hayward and Caltrans for review and comment, and to the CPM for review and approval, a copy of their construction traffic control plan and transportation demand implementation program. Additionally, every 4 months during construction the project owner shall submit turning movement studies for the intersection at Enterprise Avenue and Clawiter Road during the A.M. (7:30 to 8:30 a.m.) and P.M. (4:30 to 5:30 p.m.) peak hours to confirm that construction trip generation rates identified in the AFC and used to determine less than significant impacts to City of Hayward streets and are not being exceeded.

~~**TRANS-2** The project owner shall develop an off-site construction employee parking program that is designed to reduce the number of trips in the project vicinity. This plan should show that the location and number of parking spaces available offsite is adequate for peak construction employees, that the~~

~~number of busses and bus capacity will be adequate to shuttle peak construction 218 employees to and from the project site, that the hours of operation for the shuttle bus pickup and drop off times are generally outside the adjacent street peak hours, etc. Since some on site parking will be available, the parking program should assign general parking locations (on-site or off-site) to employees. Employees should not be encouraged to drive to the project site for a parking space only to realize that one isn't available.~~

~~**Verification:** At least 30 days prior to the start of site preparation or earth moving activities, the project owner shall provide to the City of Hayward (for determination of compliance with local LORS) and to the CPM (for approval), a copy of the parking and shuttle bus program. Additionally, the project owner shall include in its Monthly Compliance Reports information that documents the number of employees parking offsite versus the total number of employees, the shuttle bus rider ship, and the shuttle bus hours of operation.~~

~~**TRANS-3** The project owner shall ensure that all federal, state, and local regulations for the transportation of hazardous materials are observed.~~

~~**Verification:** The project owner shall include in its Monthly Compliance Reports copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transportation of hazardous substances.~~

TRANS-4 The project owner shall complete construction of Enterprise Avenue along the project frontage. Enterprise Avenue is to be constructed as a standard 60-foot industrial public street per City of Hayward Detail SD-102. This includes removal of the temporary asphalt curb, construction of approximately 21 feet of street pavement and a standard 6-foot sidewalk.

Verification: At least 30 days prior to operation of the RCEC plant, the project owner shall submit to the CPM, written verification from the City of Hayward that construction of Enterprise Avenue along the project frontage has been completed in accordance with the City of Hayward's standards.

TRANS-5 ~~The project owner shall design and construct improvements on the portion of Whitesell Street along the project frontage. Whitesell Street shall be constructed to be 48 feet wide with a standard 60-foot right-of-way per City of Hayward standards.~~

~~**Verification:** Prior to the start of site mobilization, the project owner shall submit to the CPM written verification from the City of Hayward that improvements on Whitesell Street along the project frontage has been completed in accordance with the City of Hayward standards.~~

TRANS-6 The project owner shall ~~be required to~~ resurface Enterprise Avenue and Clawiter Road, ~~which had a new asphalt overlay from Clawiter Road to the project site completed in July 2001~~, if damage is caused by construction traffic. The degree of rehabilitation is dependent on a condition inspection by the City Engineer after completion of the RCEC project. ~~This proposed condition is consistent with City of Hayward requirements on large development projects.~~

Verification: At least 30 days prior to project site mobilization, the project owner shall submit to the CPM a letter agreeing to resurface Enterprise Avenue, if in the opinion of the City of Hayward City Engineer, damage to the asphalt overlay is caused by heavy equipment used in the construction of the RCEC. If required, the project owner shall resurface Enterprise Avenue and Clawiter Road in accordance with City of Hayward standards.

~~**TRANS-7** The property owner shall grant to the City of Hayward a section of land of varying width up to 12 feet, totaling approximately 4,826 square feet, along the westerly side of Whitesell Street and the easterly line of Parcel 3 of Parcel Map No. 397, as shown on the 35 percent plan submittal for the realignment of Whitesell Street prepared by Bissel & Karn and submitted to the City of Hayward on January 4, 1993.~~

~~**Verification:** At least 60 days prior to project site mobilization, the project owner shall submit to the CPM documents verifying dedication of the defined property to the City of Hayward.~~

~~**TRANS-8** The property owner shall grant to the City of Hayward a 10-foot section of land along Enterprise Avenue for street right-of-way along the northerly line of Parcel 3 of Parcel Map No. 397.~~

~~**Verification:** At least 60 days prior to project site mobilization, the project owner shall submit to the CPM documents verifying dedication of the defined property to the City of Hayward.~~

TRANS-9 The project owner or its contractor shall comply with the City of Hayward Planning Department limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from the City of Hayward Public Works Department.

Verification: In the Monthly Compliance Reports, the project owner shall submit copies of any encroachment permits received during that month's reporting period to the Compliance Project Manager (CPM). In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-10 The project owner shall ensure that the following mitigation measures are implemented to discourage pilots from flying over or in the proximity to the RCEC. These would include:

- have the FAA issue a Notice to Airman (NOTAM) advising pilots to avoid overflight of the plant;
- have the FAA revise any instrument approach that currently directs aircraft directly over the power plant at low elevation;
- revise the San Francisco Sectional Chart to include a marker showing where the plant is located and adding a recommendation about avoiding overflight; and

- add a new remark to the airport surface observing system (ASOS) equipment that advises pilots, as they approach or depart the airport, to avoid direct overflight of the RCEC.

Verification: Sixty days prior to the start of operation, the project owner shall provide copies of the new FAA improved and implemented NOTAM, instrument approach (s), San Francisco Sectional Chart, and a transcript of the ASOS recording to the City of Hayward for review, and the CPM for approval.

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TRAFFIC AND TRANSPORTATION-APPENDIX-1
PLUME VELOCITY ANALYSIS
Testimony of William Walters

INTRODUCTION

The following provides the assessment of the Russell City Energy Project (RCEC) cooling tower and gas turbine heat recovery steam generator (HRSG) exhaust stack plume velocities. Staff completed calculations to determine the worst-case vertical velocities at different heights above the stacks using the project owner's proposed cooling tower and gas turbine/HRSG design.

PROJECT DESCRIPTION

The approved project will utilize two Siemens-Westinghouse 501FD gas turbines which will be operated in combined-cycle mode. The approved project also includes a nine-cell plume abated cooling tower.

The RCEC project owner has submitted an amendment to the existing license that seeks, among other things, to move the site location and modify the design for the two 7F frame gas turbine/HRSGs and eliminate the steam injection power augmentation and eliminate the economizer bypass system that would have reduced the plume frequency of the gas turbine/HRSG plumes.

The project amendment does not request revision to Condition of Certification **VIS-8** in relation to the plume abated cooling tower. Therefore, the existing design of the nine-cell plume abated cooling tower remains valid.

PLUME VELOCITY CALCULATION METHOD

The calculation of vertical plume velocity is not currently an option in USEPA approved air dispersion models. There are air dispersion and computational fluid dynamics models available from Australia and Europe that will provide modeled plume vertical velocity results. Additionally, there is at least one simplified calculation approach that provides vertical velocity results. The modeling approaches are expensive and would require the use of proprietary models, therefore the Energy Commission has decided to go with the calculation approach that will provide reasonably conservative estimates of the average plume vertical velocity values for use in air traffic safety analysis.

The project owner has also provided a separate plume velocity analysis, revised after data response and issue workshops, that was prepared by the Katestone Environmental (Katestone 2007) based on a proprietary model developed from the "Spillane approach" as presented in the "Aviation Safety and Buoyant Plumes" paper (Best 2003). The final report was not completed and docketed at the time of this analysis. Katestone was still addressing staff and project owner comments on the docketed draft report.

Staff has reviewed the Best paper and the draft Katestone report and considers that the Spillane approach presented in both will provide reasonably conservative estimates for worst-case vertical plume velocity for single stacks. Staff is still not completely certain that the multiple stack approach used by Katestone, in comparison to other multiple stack plume rise approaches used for The Air Pollution Model (TAPM) that were also reviewed by staff (CSIRO 2005), provides the most conservative analysis approach. However, without having empirical data staff cannot determine which theoretical multiple stack plume velocity approach is the most accurate.

The Spillane approach calculation used by staff is limited to calm wind conditions, which are the worst-case wind conditions. The Katestone report also provides results based on wind speed frequencies that staff could not review or duplicate without a copy of the proprietary Katestone model. The Spillane approach, as presented in the Best Paper, uses the following equations to determine vertical velocity for single stacks during dead calm wind (i.e. wind speed = 0) conditions:

(1) $(V*a)^3 = (V*a)_o^3 + 0.12*F_o*[(z-z_v)^2-(6.25D-z_v)^2]$
(2) $(V*a)_o = V_{exit}*D/2*(T_a/T_s)^{0.5}$
(3) $F_o = g*V_{exit}*D^2*(1-T_a/T_s)/4$
(4) $Z_v = 6.25D*[1-(T_a/T_s)^{0.5}]$

Where: V = vertical velocity (m/s), plume-average velocity
a = plume top-hat radius (m, increases at a linear rate of $a = 0.16*(z- z_v)$
F_o= initial stack buoyancy flux m^4/s^3
z = height above ground (m)
z_v= virtual source height (m)
V_{exit}= initial stack velocity (m/s)
D = stack diameter (m)
T_a= ambient temperature (K)
T_s= stack temperature (K)
g = acceleration of gravity (9.8 m/s^2)

Equation (1) is solved for V at any given height above ground that is above the momentum rise stage for single stacks (where z > 6.25D) and at the end of the plume merged stage for multiple plumes. This solution provides the plume-average velocity for the area of the plume at a given height above ground; the peak plume velocity would be higher than the plume-average velocity predicted by this equation. As can be seen the stack buoyancy flux is a prominent part of Equation (1). The calm condition calculation basis clearly represents the worst-case conditions, and the vertical velocity will decrease substantially as wind speed increases.

For multiple stack plumes, where the stacks are equivalent, the multiple stack plume velocity during calm winds was calculated by staff in a simplified fashion as follows:

(5) $V_m = V_{sp}*N^{0.25}$

Where: V_m = multiple stack combined plume vertical velocity (m/s)
V_{sp} = single plume vertical velocity (m/s), calculated using Equation (1)
N = number of stacks

VERTICAL PLUME VELOCITY ANALYSIS

The vertical plume velocities were calculated for two specific conditions each for the cooling tower and gas turbine/HRSG. The ambient and exhaust conditions for the gas turbine/HRSG and cooling tower, operating at full load, are provided below in **PLUME VELOCITY Table 1**.

PLUME VELOCITY Table 1
Gas Turbine/HRSG and Cooling Tower Parameters

Case	Gas Turbine/HRSG		Cooling Tower	
	38°F	**59°F**	**38°F**	**68°F**
Stack Height ft (m)	145 (44.196)		60 (18.288)	
Stack Diameter ft (m)	18 (5.4864)		32 (9.7536)	
Stack Velocity ft/s (m/s)	72.1 (21.98)	74.0 (22.56)	33.82 (10.31)	33.82 (10.31)
Exhaust Temperature F (K)	193 (362.6)	194 (363.15)	73.2 (296)	81 (300.3)

Source: RCEC 2006, RCEC 2007

Using the Spillane approach, the plume velocity at different heights above ground was determined by Staff and Katestone for calm conditions. Staff's calculated plume velocity values are provided in **PLUME VELOCITY Table 2,** and are compared to those provided by the project owner (Katestone 2007) in **PLUME VELOCITY Table 3**. The gas turbine/HRSG plume velocities are calculated for the two gas turbine/HRSG exhausts while the cooling tower plume velocities are calculated for a nine-stack combined exhaust. The values provided below assume that the multiple stack plumes have merged; however, the plumes may not have fully merged at the lowest heights in this table.

PLUME VELOCITY Table 2
Staff Predicted Calm Wind RCEC Plume Velocities

	Gas Turbine/HRSG Plume Velocity (m/s)		Cooling Tower Plume Velocity (m/s)	
Ambient Air Temperature				
Height (ft)	**38°F**	**59°F**	**38°F**	**68°F**
300	10.18	9.88	8.00	7.64
400	7.28	6.99	6.67	5.84
500	6.13	5.85	5.94	4.91
600	5.48	5.22	5.46	4.34
700	5.05	4.80	5.12	3.96
800	4.73	4.49	4.84	3.68
900	4.49	4.26	4.63	3.47
1,000	4.29	4.06	4.44	3.30
1,100	4.12	3.90	4.29	3.17
1,200	3.98	3.77	4.15	3.05
1,300	3.85	3.65	4.03	2.95
1,400	3.74	3.54	3.92	2.86
1,500	3.64	3.45	3.83	2.78
1,600	3.56	3.37	3.74	2.71
1,700	3.47	3.29	3.66	2.65
1,800	3.40	2.71	3.59	2.59
1,900	3.33	2.65	3.52	2.54
2,000	3.27	2.60	3.46	2.49

Source: Staff calculations.

As explained in the **TRANSPORTATION AND TRAFFIC** section a vertical velocity of 4.3 m/s has been determined as the critical velocity of concern to light aircraft. For the gas turbine HRSG cases the heights at which the plume velocity drops below 4.3 m/s are calculated to be approximately 995 feet and 880 feet, respectively for the 38°F and 59°F operating cases. This indicates that the plume velocity of the gas turbine/HRSG exhausts is not a very strong function of ambient temperature. For the cooling tower cases the heights at which the plume velocity drops below 4.3 m/s are calculated to be approximately 1,033 feet and 610 feet, respectively for the 38°F and 68°F operating cases. This indicates that the plume velocity for the cooling tower exhausts is a very strong function of ambient temperature.

PLUME VELOCITY Table 3 compares staff's results with the project owner's (Katestone) worst-case calm condition results.

PLUME VELOCITY Table 3
Predicted Worst-Case Plume Velocities Comparison

	Gas Turbine/HRSG		Cooling Tower	
4.3 m/s Height (ft)	**Staff**	**Katestone**	**Staff**	**Katestone**
Single Plume	650	650	330	344
Merged Plumes	935	935	1,042	1,033

Source: Staff calculations and Katestone 2007.

Staff's calculations and the Katestone report calm wind values match very well. Staff considers the methods and results provided by the Katestone report for calm conditions to be reasonable. The Katestone report also considers the impact of wind on the vertical velocity and frequency of velocities at given heights. Staff cannot adequately review those results without a copy of the Katestone model, so this staff analysis does not provide comment on that portion of the Katestone analysis other than to note that the wind speeds noted to be used in the model appear reasonably conservative.

BLYTHE CASE VERTICAL VELOCITY COMPARISON

The Blythe Energy Power Plant Project (BEP) underwent an extensive aircraft safety analysis. Staff has fly over observation data from pilots for this operating facility, so it can serve as a base line for comparison with RCEC. In order to complete this comparison an analysis of the BEP gas turbine/HRSG and cooling tower plumes has been completed. The ambient and exhaust conditions for the gas turbine/HRSG and cooling tower, operating at full load, are provided below in **PLUME VELOCITY Table 4**.

PLUME VELOCITY Table 4
BEP Gas Turbine and Cooling Tower Parameters

Case	**Gas Turbine/HRSG**		**Cooling Tower**	
	38°F	**59°F**	**38°F**	**68°F**
Stack Height ft (m)	130 (39.62)		40.14 (12.2)	
Stack Diameter ft (m)	16.5 (5.02)		36.7 (11.2)	
Stack Velocity ft/s (m/s)	84.7 (25.8)	85.0 (25.9)	22.0 (6.7)	21.8 (6.6)
Exhaust Temperature F (K)	216 (375)	218 (376)	74 (296)	85 (303)

Source: BEP 2004.

Using the Spillane approach, the plume velocity at different heights above ground was determined for the BEP exhausts. Staff's calculated BEP plume velocity values are provided in **PLUME VELOCITY Table 5,** and are compared to those calculated for RCEC in **PLUME VELOCITY Table 6**. The gas turbine/HRSG plume velocities are calculated for the two gas turbine/HRSG exhausts while the cooling tower plume velocities are calculated for an eight-stack combined exhaust.

PLUME VELOCITY Table 5
BEP Gas Turbine/HRSG and Cooling Tower Predicted Plume Velocities

	Gas Turbine/HRSG Plume Velocity (m/s)		Cooling Tower Plume Velocity (m/s)	
Height (ft)	**38°F**	**59°F**	**38°F**	**68°F**
300	9.87	9.82	5.64	5.25
400	7.27	7.14	5.36	4.54
500	6.17	6.02	5.04	4.11
600	5.54	5.38	4.77	3.81
700	5.11	4.95	4.54	3.59
800	4.80	4.64	4.34	3.41
900	4.55	4.40	4.18	3.27
1,000	4.35	4.20	4.03	3.14
1,100	4.19	4.04	3.90	3.04
1,200	4.04	3.90	3.79	2.95
1,300	3.92	3.78	3.69	2.86
1,400	3.81	3.67	3.60	2.79
1,500	3.71	3.57	3.52	2.72
1,600	3.62	3.49	3.44	2.66
1,700	3.54	3.41	3.37	2.61
1,800	3.46	3.34	3.30	2.56
1,900	3.39	3.27	3.25	2.51
2,000	3.33	3.21	3.19	2.47

Source: Staff calculations.

For the gas turbine/HRSG cases the heights at which the plume velocity drops below 4.3 m/s are calculated to be approximately 1,030 feet and 950 feet, respectively for the 38°F and 59°F operating cases. These heights are approximately 35 and 70 feet higher than calculated for the RCEC gas turbine/HRSGs.

For the cooling tower cases the heights at which the plume velocity drops below 4.3 m/s are calculated to be approximately 825 feet and 450 feet, respectively for the 38°F and 68°F operating cases. These heights are approximately 265 and 160 feet lower than calculated for the RCEC gas turbine/HRSGs. The impact of potential drag of visible cooling tower plumes has not been accounted for in this worst case analysis. The BEP cooling tower is not plume abated so visible plume formation would occur during the 38°F case which would case a drag on the plume and lower velocity.

PLUME VELOCITY Table 6 compares the RCEC and BEP plume vertical velocity results for the low temperature (38°F) case.

PLUME VELOCITY Table 6
RCEC vs. BEP Low Temperature Plume Velocities Comparison

	Gas Turbine/HRSG Plume Velocity (m/s)		Cooling Tower Plume Velocity (m/s)	
Height (ft)	**RCEC**	**BEP**	**RCEC**	**BEP**
300	10.18	9.87	8.00	5.64
400	7.28	7.27	6.67	5.36
500	6.13	6.17	5.94	5.04
600	5.48	5.54	5.46	4.77
700	5.05	5.11	5.12	4.54
800	4.73	4.80	4.84	4.34
900	4.49	4.55	4.63	4.18
1,000	4.29	4.35	4.44	4.03
1,100	4.12	4.19	4.29	3.90
1,200	3.98	4.04	4.15	3.79
1,300	3.85	3.92	4.03	3.69
1,400	3.74	3.81	3.92	3.60
1,500	3.64	3.71	3.83	3.52
1,600	3.56	3.62	3.74	3.44
1,700	3.47	3.54	3.66	3.37
1,800	3.40	3.46	3.59	3.30
1,900	3.33	3.39	3.52	3.25
2,000	3.27	3.33	3.46	3.19

Source: Staff calculations.

This comparison shows that the RCEC and BEP gas turbine/HRSG plume velocities are very similar, with BEP exhausts having a slightly higher velocity at higher elevation due to its hotter exhaust temperature. The cooling tower vertical plume velocities are calculated to be somewhat higher for RCEC than BEP, which is not surprising since the heat load for the RCEC cooling tower is somewhat higher, the initial stack height and velocity are both higher for the RCEC cooling tower, and the RCEC cooling tower will have additional thermal buoyancy since it is a plume abated tower.

WIND SPEED AND TEMPERATURE STATISTICS

Staff has a number of meteorological file options from the San Francisco Bay Area, including BAAQMD website data and available data from SFO and San Jose. As the wind speed and temperature statistics are of greatest concern the nearest BAAQMD monitoring station, Union City, can be used. The Union City monitoring station is located a little more than four miles southeast of the project site. **PLUME VELOCITY Table 7** provides wind speed and temperature statistics for Union City as averaged over 7 years of available data.

PLUME VELOCITY Table 7
Wind Speed and Temperature Statistics for Union City

Wind Speed		Temperature		Temperature and Wind Speed	
≤ 1 m/s	8.29%	< 40F	2.60%	≤ 1 m/s, < 40F	0.70%
≤ 2 m/s	37.99%	< 50F	16.82%	≤ 1 m/s, < 50F	3.49%
≤ 3 m/s	59.83%	< 60F	60.12%	≤ 1 m/s, < 60F	6.94%
≤ 4 m/s	74.09%				
≤ 5 m/s	92.72%				

Source: Staff data reduction of Union City meteorological data (BAAQMD 2007).

Calm conditions/ low wind speeds are not frequent in the site area but that they do occur during lower temperature periods, which are the conditions most favorable for the formation of higher velocity and thermally buoyant HRSG and cooling tower plumes.

CONCLUSIONS

The calculated calm wind condition vertical plume velocities from the RCEC gas turbine/HRSG and cooling tower will remain over 4.3 m/s, the critical velocity, at heights above 900 and 800 feet for the gas turbine/HRSG for when the ambient temperature is low or moderate, and at heights above 1,000 feet and 600 feet for the cooling tower when the ambient temperature is 38F and 68F, respectively. Ambient conditions (temperatures less than 60ºF and wind speeds less than 1m/s) conducive to the formation of thermal plume velocities of concern would occur on average approximately seven percent of the time.`

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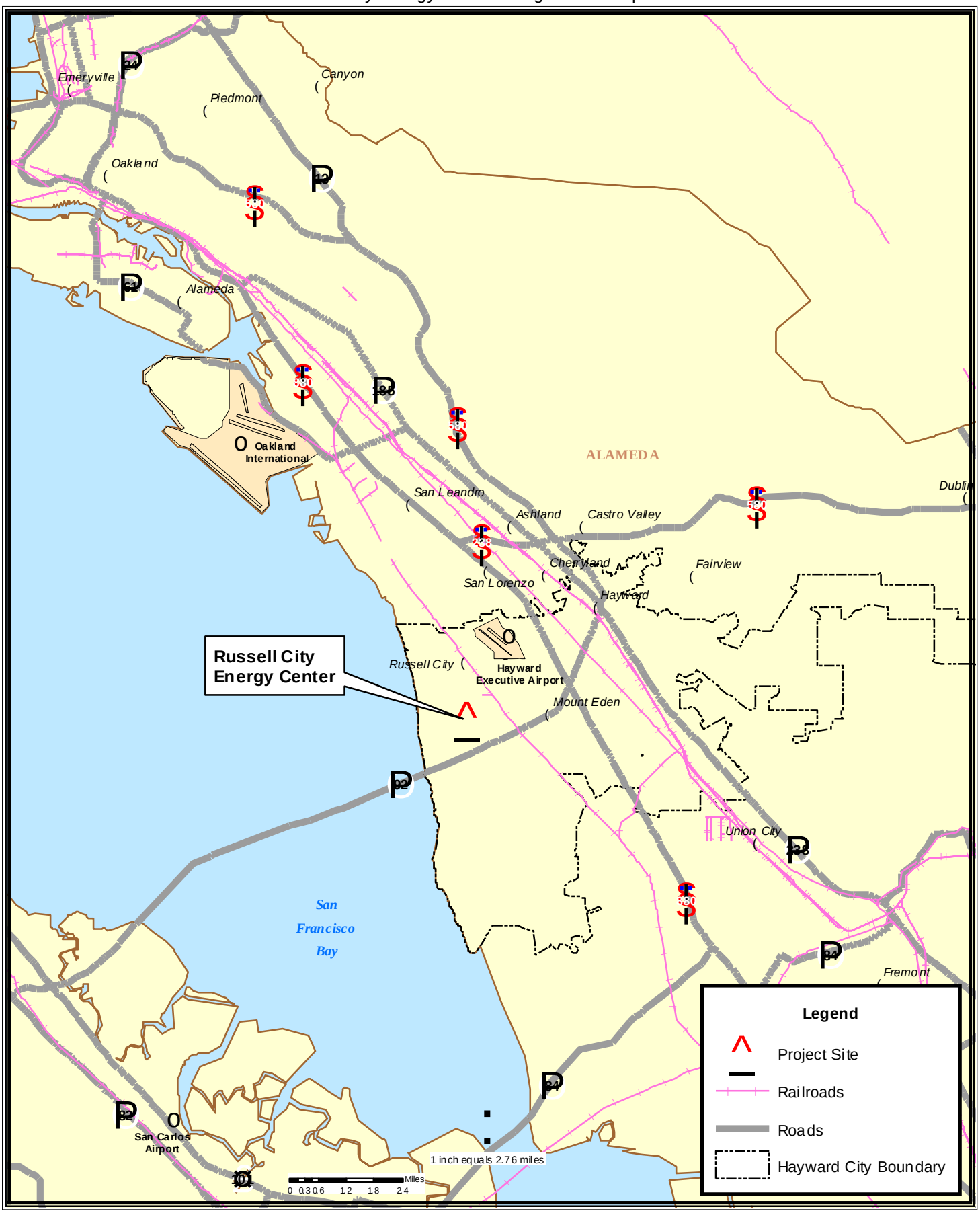
TRAFFIC & TRANSPORTATION - FIGURE 1

Russell City Energy Center - Regional Transportation

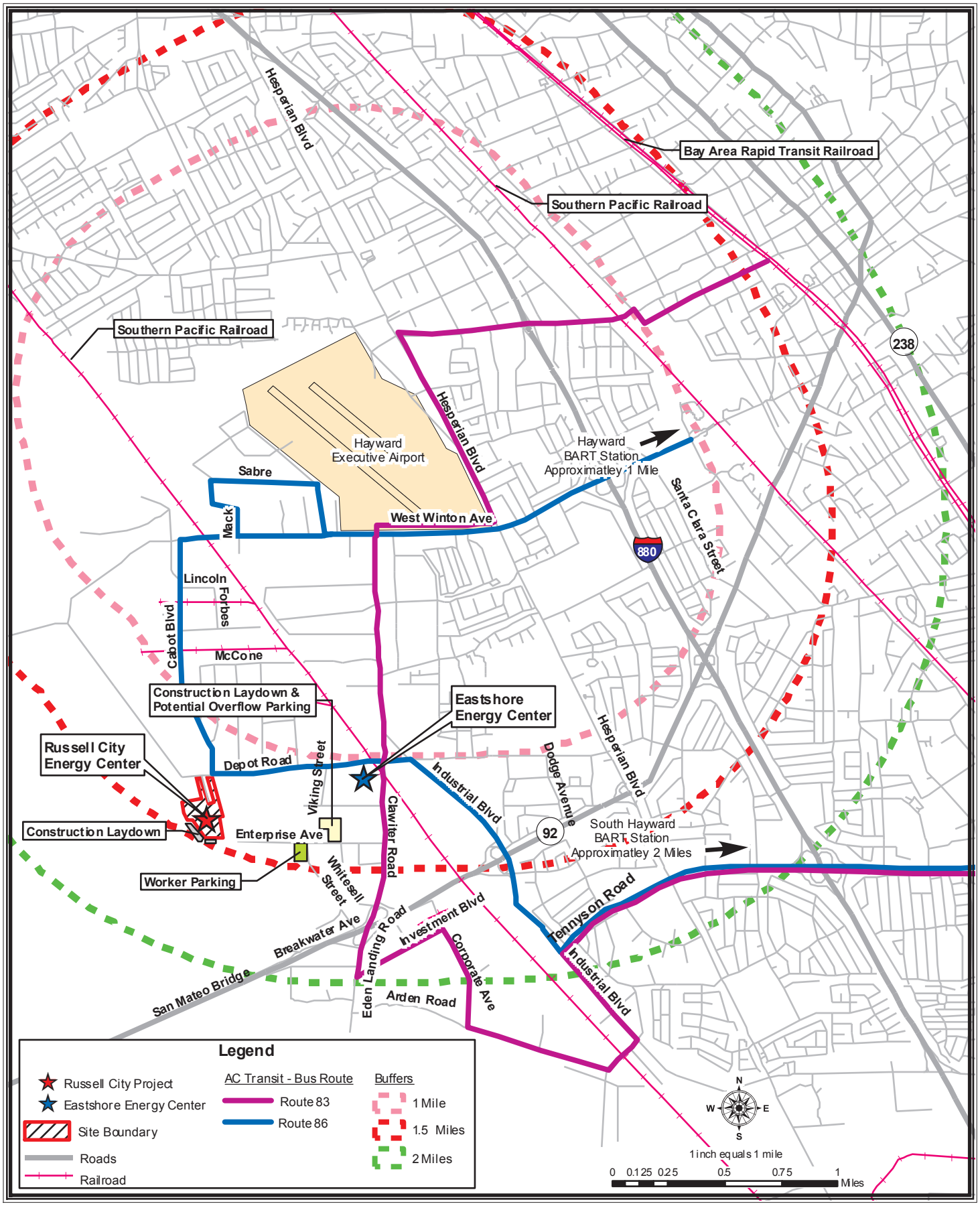


CALIFORNIA ENERGY COMMISSION, ENERGY FACILITIES SITING DIVISION, JANUARY 2007

SOURCE: California Energy Commission & TIGER Files

TRAFFIC & TRANSPORTATION - FIGURE 2

Russell City Energy Center - Local Transportation

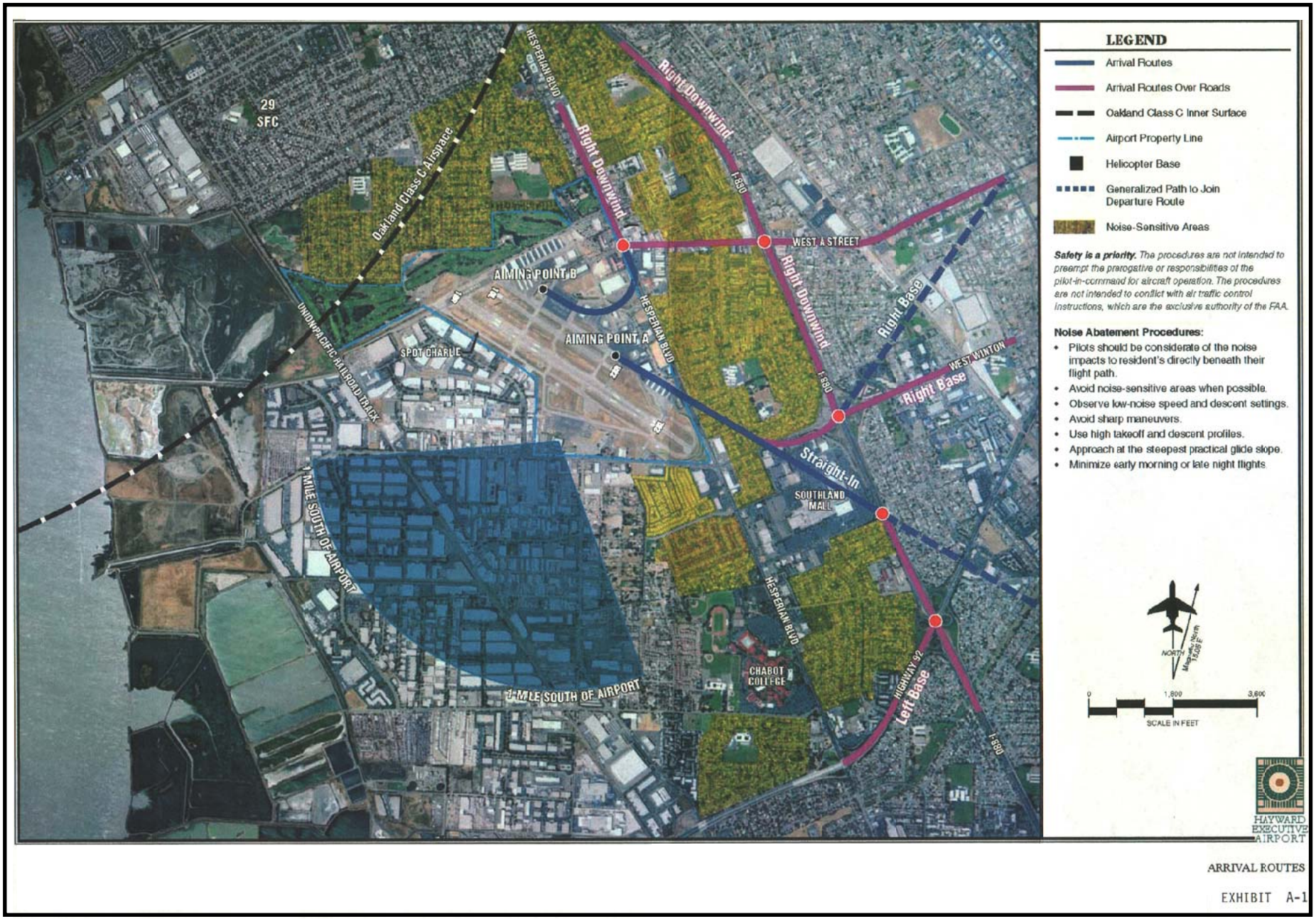


CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, MAY 2007

SOURCE: U.S Census Bureau TIGER Files and AC Transit Schedule and RCEC Amendment #1- Figure 2.4-1

TRAFFIC & TRANSPORTATION - FIGURE 3

Russell City Energy Center - Helicopter Arrival and Departure Routes



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, MAY 2007

SOURCE: City of Hayward Staff Report Item 2 Exhibit 1

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

SUMMARY OF CONCLUSIONS

Staff finds that the design and operational plan for the proposed modification to the transmission line for the Russell City Energy Center (RCEC) would be in keeping with standard Pacific Gas and Electric's (PG&E's) practices reflecting compliance with applicable laws, ordinances, regulations and standards (LORS). The proposed modification is the relocation of RCEC away from the presently approved site, which would necessitate relocating the route of a relatively small (500-foot to 1,000-foot) portion of RCEC's already approved overhead 230-kilovolt (Kv) transmission line that would connect it to PG&E's Eastshore Substation. The section to be modified is the part connecting RCEC to the section of the approved line that begins from the corridor of the existing PG&E 115-kV Grant-Eastshore line. Since the same safety and effective field management measures would be applied to the entire RCEC line as proposed for both the original and new locations, staff regards the proposed modification plan as adequate to ensure compliance with applicable LORS. With the five proposed conditions of certification, any line-related safety and nuisance impacts would be less than significant.

INTRODUCTION

The purpose of this analysis is to assess the proposed project line modification for compliance with the laws, ordinances, regulations and standards (LORS), which staff found adequate (for the original project location) for ensuring public health and safety. Staff's analysis focuses on the following issues as related primarily to the physical presence of the line, or secondarily to the physical interactions of its electric and magnetic fields:

- aviation safety;
- interference with radio-frequency communication;
- audible noise;
- fire hazards;
- hazardous shocks;
- nuisance shocks; and
- electric and magnetic field (EMF) exposure.

The following are the federal, state, and local laws and policies that apply to the control of the field and non-field impacts of electric power lines. Staff's analysis examines the project's compliance with these requirements.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

TRANSMISSION LINE SAFETY AND NUISANCE (TLSN) TABLE 1
Laws, Ordinances, Regulations and Standards (LORS)

Applicable LORS	Description
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, " Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7460) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal	
Title 47, CFR, Section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Audible Noise	Not to exceed applicable local noise ordinances – (no design-specific federal or state regulations for noise from transmission lines).
Hazardous and Nuisance Shocks	
State	
CPUC GO-95, "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.
Title 8, California Code of Regulations (CCR) Section 2700 et seq. "High Voltage Safety Orders"	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.

Applicable LORS	Description
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
Industry Standards	
Institute of Electrical and Electronics Engineers (IEEE) 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations"	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
Electric and Magnetic Fields	
State	
GO-131-D, CPUC "Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California"	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision 93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
Industry Standards	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
Fire Hazards	
State	
14 CCR Sections 1250-1258, "Fire Prevention Standards for Electric Utilities"	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

SETTING

As noted in the **Project Description** section, the present proposal is to relocate the previously approved RCEC power plant to a site approximately 1,300 feet (0.25 miles) northwest of the original site. The only change to the power plant's already approved overhead 230-kV line would be relocation of a relatively small (500-foot to 1,000-foot) segment running from the project's switchyard to the corridor of PG&E's 115-kV (at Enterprise Avenue) from where both lines would run parallel to each other (in the existing PG&E line corridor that the 115-kV line now occupies by itself) to their respective termination points within PG&E's Eastshore Substation to the east. This new 230-kV, RCEC-to- PG&E's 115-kV line corridor segment would be erected on tubular steel poles as with the already permitted segment that begins at the noted connecting spot at Enterprise Avenue. The entire project line would be designed, built, owned,

operated, and maintained by PG&E, meaning the applicable PG&E guidelines would be followed (RCEC 2006, p. 2-18).

As more fully discussed in the **Project Description** section, the power plant owner, Russell City Energy Company, LLC, (RCEC 2006, p. 2-13) proposes two alternative routes for this proposed RCEC-to-PG&E's 115-kV corridor segment. The final length of the entire RCEC line (as it extends to the Eastshore Substation) would depend on the route chosen. The new project site and the two alternative routes for the new line segment, would (as with the original location) still lie within an industrial corridor with relatively few residences, the nearest of which would be 0.96 miles versus 0.82 miles for the previous site (RCEC 2006a, p 3-105). This means that the residential field exposure at the root of the health concern of recent years would be relatively insignificant for the new line proposal. As with the already-permitted segment, the only project-related EMF exposures of potential significance are the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the immediate vicinity of the line. These types of exposures are short term and well understood as not significantly related to the health concern.

PROJECT DESCRIPTION

The proposed line modification project would consist of the components listed below with the final length depending on which of the two alternative routes is chosen:

- An overhead, double-circuit 230-kV line extending from the project's 230-kV switchyard to the point of connection with the already-permitted Enterprise Avenue-to-the Eastshore Substation segment and,
- The project's on-site 230-kV switchyard.

As with the already-permitted segment, the proposed line's conductors would be standard PG&E, low-corona cables to be erected on tubular steel poles. The applied design and construction would be in keeping with PG&E guidelines necessary to ensure line safety and efficiency together with reliability, and maintainability.

As more fully discussed by the project owner (RCEC 2006a, p 2-13), the first alternative route would extend from the RCEC switchyard east to the eastern edge of the project's property and then run northwards towards Depot Road from where it would turn right and run approximately 230 feet to the connection point within the corridor for the PG&E 115- kV line. If this route is chosen, the total line connection from the RCEC to Eastshore Substation would be 7,010 feet (1.33 miles).

The second alternative would extend from the RCEC Switchyard eastwards to the east edge of the RCEC property line and then run southwards to the property line from which it would turn east and run for 950 feet to connect with the noted permitted segment. The choice of this route would bring the total length of the RCEC-to-Eastshore Substation connection line to 6410 feet (1.21 miles). Staff does not see any significant differences between the routes with regard to the safety and field management issues of concern in this analysis.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

The potential magnitude of the line impacts of concern in this staff analysis depends on compliance with the listed LORS whose related mitigation measures have been established as adequate to maintain such impacts below levels of potential significance. Thus, if staff determines that the project would comply with applicable LORS, we would conclude that any transmission line-related safety and nuisance impacts would be less than significant. The nature of these individual impacts is discussed below together with the potential for compliance with the LORS that apply.

DIRECT IMPACTS AND MITIGATION

Aviation Safety

Any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace and the need to file a "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA as noted in the LORS section. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved.

As noted by the power plant owner (RCEC 2006a pp. 2-15 and 2-16), the nearest airport to the project is Hayward Executive Airport whose nearest runway is 8466 feet (1.60 miles) northeast of RCEC or related line. Although this distance is less than the FAA safe minimum of 10,000 feet, the north-to-northeast orientation of the runway would place RCEC and its related lines away from the area of potential collision hazard with utilizing aircraft. The maximum height of 115 feet for the line support structures in this situation would be well below the trigger height of 150 feet for FAA notification. At approximately 2.76 miles to the southeast, the St. Rose Hospital heliport is located too far for any of the RCEC line segments to pose an aviation hazard to utilized helicopters. Given these expected conditions, staff considers the proposed line structures as not posing an obstruction-related aviation hazard to area aircraft as defined using current FAA criteria. Therefore, no obstruction-related FAA "Notice of Construction or Alteration" would be required for the line.

Interference with Radio-Frequency Communication

Transmission line-related radio-frequency interference is one of the indirect effects of line operation and is produced by the physical interactions of line electric fields. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge, but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern

transmission lines. The level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts is, therefore, minimized by reducing the line electric fields and locating the line away from inhabited areas.

The proposed line segment would be built and maintained in keeping with standard PG&E practices that minimize surface irregularities and discontinuities. Moreover, the potential for such corona-related interference is usually of concern for lines of 345-kV and above, and not the proposed 230-kV line. The proposed low-corona designs are used for all PG&E lines of similar voltage rating to reduce surface-field strengths and related potential for corona effects. Since these existing lines do not currently cause the corona-related complaints along their existing routes, staff does not expect any corona-related radio-frequency interference or related complaints in the general project area. However, staff recommends Condition of Certification **TLSN-2** to ensure mitigation as required by the FCC in the unlikely event of complaints.

Audible Noise

The noise-reducing measures for field strength reduction are not specifically mandated by federal or state regulations in terms of specific noise limits. As with radio noise, such noise is limited instead through design, construction or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability. Audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345-kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345-kV such as the proposed line segment. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a right-of-way of 100 feet or more. Since the low-corona designs are also aimed at minimizing field strengths, staff does not expect the proposed line segment to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed line and related facilities, please refer to staff's analysis in the **Noise and Vibration** section.

Fire Hazards

The fire hazards addressed through the related LORS in **TLSN Table 1** of this analysis are those that could be caused by sparks from conductors of overhead lines, or that could result from direct contact between the line and nearby trees and other combustible objects.

Standard fire prevention and suppression measures for similar PG&E lines would be implemented for the proposed project line (RCEC 2006a, p. 2-18). The intended compliance with the clearance-related aspects of GO-95 would be an important part of this mitigation approach. Condition of Certification **TLSN-4,** is recommended to ensure compliance with important aspects of the fire prevention measures.

Hazardous Shocks

Hazardous shocks are those that could result from direct or indirect contact between an individual and the energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

No design-specific federal regulations have been established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public.

The power plant owner's intention to implement the GO-95-related measures against direct contact with the energized line (RCEC 2006a, p. 2-18) would serve to minimize the risk of hazardous shocks. Staff's recommended Condition of Certification **TLSN-1** would be adequate to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line's electric and magnetic fields.

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). For the proposed project line, the project owner will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way.

The potential for nuisance shocks around the proposed line segment would be minimized through standard industry grounding practices (RCEC 2006a, p. 2-18). Staff recommends Condition of Certification **TLSN-5** to ensure such grounding.

Electric and Magnetic Field Exposure

The possibility of deleterious health effects from EMF exposure has increased public concern in recent years about living near high-voltage lines. Both electric and magnetic fields occur together whenever electricity flows, hence the general practice of describing exposure to them together as EMF exposure. The available evidence as evaluated by the California Public Utilities Commission (CPUC), other regulatory agencies, and staff, has not established that such fields pose a significant health hazard to exposed humans. There are no health-based federal regulations or industry codes specifying environmental limits on the strengths of fields from power lines. Most regulatory agencies believe, as staff does, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore, considers it appropriate in light of present uncertainty, to recommend reduction of such fields as feasible without affecting safety, efficiency, reliability and maintainability.

While there is considerable uncertainty about EMF health effects, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures.

State

In California, the CPUC (which regulates the installation and operation of high-voltage lines) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It requires each utility within its jurisdiction to establish EMF-reducing measures and incorporate such measures into the designs for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Publicly owned utilities, which are not within the jurisdiction of the CPUC, voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013.

In keeping with this CPUC policy, staff requires a showing that each proposed overhead line would be designed according to the EMF-reducing design guidelines of the utility in the service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local factors bearing on safety, reliability, efficiency, and maintainability. Therefore, it is up to each project owner to ensure that such measures are applied in ways that prevent significant impacts on line operation and safety. The extent of such applications would be reflected by ground-level field strengths as measured during operation. When estimated or measured for lines of similar voltage and current-carrying capacity, such field strength values can be used by staff and other regulatory agencies to assess the effectiveness of the applied reduction measures. These field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the support

structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new or modified line in California is currently required by the CPUC to be designed according to the EMF-reducing guidelines of the electric utility in the service area involved, its fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the proposed project line segment according to existing PG&E field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management.

The CPUC has finished revisiting the EMF management issue to assess the need for policy changes to reflect the available information on possible health impacts. The findings did not point to a need for significant changes to existing field management policies.

Industrial Standards

The present focus is on the magnetic field because only it can penetrate the soil, buildings and other materials to potentially produce the types of health impacts at the root of the health concern of recent years. As one focuses on the strong magnetic fields from the more visible overhead transmission and other high-voltage power lines, staff considers it important, for perspective, to note that an individual in a home could be exposed to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S. Department of Energy, 1998). The difference between these types of field exposures is that the higher-level, appliance-related exposures are short-term, while the exposure from power lines are lower level, but long-term. Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than around high-voltage power lines.

As with similar PG&E lines, specific field strength-reducing measures would be incorporated into the design of the proposed line segment to ensure the field strength minimization currently required by the CPUC in light of the concern over EMF exposure and health.

The field reduction measures to be applied include the following:

1. Increasing the distance between the conductors and the ground;
2. Reducing the spacing between the conductors;
3. Minimizing the current in the line; and
4. Arranging current flow to maximize the cancellation effects from interacting of conductor fields.

Since optimum field-reducing measures would be incorporated into the proposed line design, staff considers further mitigation to be unnecessary, but would seek to validate the project owner's assumed reduction efficiency from the field strength measurements recommended in Condition of Certification, **TLSN-3**.

CUMULATIVE IMPACTS AND MITIGATION

Since the proposed power plant transmission line segment and related switchyard would be designed by PG&E according to its field-reducing PG&E guidelines (as currently required by the CPUC for effective field management), staff expects the resulting fields to be of the same intensity as fields from PG&E lines of the same voltage and current-carrying capacity. Any contribution to cumulative area exposures should be at similar levels. It is this similarity in intensity that constitutes compliance with current CPUC requirements on EMF management. The actual field strengths and contribution levels for the proposed line design would be assessed from the results of the field strength measurements specified in Condition of Certification **TLSN-3**.

COMPLIANCE WITH LORS

As previously noted, current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility lines to be interconnected. The utility in this case is PG&E who would also own the proposed lines. Since the proposed project line segment and related switchyard would be designed according to the respective requirements of GO-95, GO-52, GO-131-D, and Title 8, Section 2700 et seq. of the California Code of Regulations, and operated and maintained by PG&E according to its guidelines on line safety and field strength management, staff considers the presented design and operational plan to be in compliance with the health and safety LORS of concern in this analysis. The actual contribution to the area's field exposure levels would be assessed from results of the field strength measurements required in Condition of Certification **TLSN-3**. Staff has considered the minority population as identified in **SOCIOECONOMICS Figure 1** in its impact analysis and has found no potentially significant adverse impacts. Therefore, there are no environmental justice issues associated with Transmission Line Safety and Nuisance.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any public or agency comments.

CONCLUSIONS

Since the proposed line segment would not pose an aviation hazard to area airports or heliports, staff does not consider it necessary to recommend location changes on the basis of such a hazard.

The potential for nuisance shocks would be minimized by PG&E through its grounding and other field-reducing measures. These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise. The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of PUC's General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, would minimize fire hazards while the use of PG&E's low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise

and its related interference with radio-frequency communication in the area around the proposed route.

Since electric or magnetic field health effects have neither been established nor ruled out for the proposed or already-permitted RCEC line segment and similar transmission lines, the public health significance of any related field exposures cannot be characterized with certainty. The only conclusion to be reached with certainty is that the proposed line's design and operational plan would be adequate to ensure that the generated electric and magnetic fields are managed to an extent the CPUC considers appropriate in light of the available health effects information. The long-term, mostly residential magnetic exposure of health concern in recent years would be insignificant for the proposed line given the general absence of residences along the proposed route. On-site worker or public exposure would be short term and at levels expected for PG&E lines of similar design and current-carrying capacity. Such exposure is well understood and has not been established as posing a significant human health hazard.

Since the proposed project line would be designed, built, owned, operated and maintained by PG&E to minimize the health, safety, and nuisance impacts of concern to staff, while located along a route without nearby residences, staff considers it as conforming to applicable LORS. With the five proposed conditions of certification, any of these impacts would be less than significant.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are proposed new conditions that staff has identified to replace the conditions contained in the original RCEC Decision (CEC 2002b), as a result of the project changes proposed by the project owner as part of the Petition to Amend submitted to the Energy Commission on November 17, 2006. Underline is used to indicate new language.

TLSN-1 The project owner shall ~~construct~~ obtain from PG&E evidence that the proposed transmission lines would be constructed by PG&E according to the requirements of California Public Utility Commission's CPUC's GO-95, GO-52, ~~applicable sections of~~ GO-131-D, Title 8, and Group 2. High Voltage Electrical Safety Orders, Sections 2700 ~~et seq.~~ through 2974 of the California Code of Regulations, and PG&E's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

Verification: At least ~~T~~thirty days before starting construction of the transmission lines or related structures and facilities, the project owner shall submit to the Compliance Project Manager ~~(~~CPM~~)~~ ~~a letter by a California registered electrical engineer affirming compliance with this~~ specific evidence from PG&E that the lines will be constructed according to the requirements stated in the condition.

TLSN-2 The project owner shall ~~ensure~~ ~~that every~~ enter into an agreement with PG&E that ensures that PG&E would take all reasonable ~~effort will be made during project operations~~ steps to identify and correct, on a case-specific basis, any complaints of interference with radio or television ~~reception or the functioning of any electrical devices or equipment~~ signals from operation of the project-

related lines and associated switchyards. The agreement shall include verification of PG&E's intention to maintain records for a period of five years of all complaints of radio or television interference attributable to line operation together with the corrective action taken in response to each complaint.

Verification: The project owner shall ~~maintain written records for a period of five years, of all complaints of all such complaints together with the corrective action taken in response to each complaint. Complaints not leading to a specific action, or for which there was no resolution, should be noted and explained. The project owner and also the complainant if possible shall sign the record, to indicate concurrence with the corrective action or agreement, with the justification for a lack of action. All reports of line related complaints shall be summarized for the project-related lines and included during the first five years of plant operation in the Annual Compliance Report.~~ provide to the CPM evidence of the above-noted agreement 60 days before the beginning of line operations.

TLSN-3 The project owner shall ~~engage a qualified consultant to~~ enter into an agreement with PG&E that ensures that PG&E would measure the strengths of the ~~line~~ electric and magnetic fields from the proposed line segment before and after ~~they are~~ it is energized~~.~~, and provide the measurements to the project owner. The ~~M~~measurements ~~should~~ shall be made according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures at ~~representative points~~ the locations of maximum field strengths along the ~~edge of the right-of-way for which field strength estimates were provided.~~chosen route. These measurements shall be completed not later than six months after the start of operations and the results obtained by the project owner and submitted to the CPM not later than 30 days afterwards.

Verification: The project owner shall provide to the CPM evidence of the above-noted agreement within 60 days before the beginning of line operation. The project owner shall ~~file~~ obtain copies of the pre-and post-energization measurements from PG&E and file them with the CPM within 60 days after completion of the post-energization measurements.

TLSN-4 The project owner shall enter into an agreement with PG&E that ensures that PG&E would ensure that the rights-of-way of the ~~project-related~~ proposed transmission line~~s~~ ~~are~~ would be kept free of combustible material, as required under the provisions of Section 4292 of the Public Resources Code and Section 1250 of Title 14 of the California Code of Regulations~~.~~, and that PG&E would provide to the project owner summaries of inspection results and any fire prevention activities carried out along the right-of-way.

Verification: The project owner shall provide to the CPM evidence of the above-noted agreement 60 days before the beginning of line operation. During the first five years of plant operation, the project owner shall ~~provide~~ obtain from PG&E, a summary of inspection results and any fire prevention activities carried out along the right-of-way and provide such summaries in the Annual Compliance Report to the CPM.

TLSN-5 The project owner shall enter into an agreement with PG&E that ensures that PG&E would ensure that all permanent metallic objects within the right-of-way of the project-related lines are grounded according to industry standards regardless of ownership. In the event of a refusal by any property owner to permit such grounding, the project owner shall obtain the related evidence from PG&E and notify the CPM accordingly. Such notification shall include, when possible, the owner's written objection. Upon receipt of such notice, the CPM may waive the requirement for grounding the object involved.

Verification: ~~At least 30 days before the line is energized, t~~The project owner shall ~~transmit~~ provide to the CPM ~~a letter confirming compliance with this condition~~ evidence of the above-noted agreement 60 days before the beginning of line operation.

REFERENCES

Electric Power Research Institute (EPRI) 1982. Transmission Line Reference Book: 345 kV and Above.

Russell City Energy Center (RCEC 2006a. Amendment I Submitted to the California Energy Commission on November 17, 2006.

National Institute of Environmental Health Services 1998. An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. A Working Group Report, August 1998.

VISUAL RESOURCES

Testimony of Mark R. Hamblin and Eric Knight

SUMMARY OF CONCLUSIONS

With the effective implementation of the mitigation measures identified by the project owner and staff's recommended conditions of certification, this project would not cause any direct, indirect or cumulative adverse visual resource impacts, and with one possible exception would comply with applicable laws, ordinances, regulations, and standards pertaining to visual resources. Specifically, the project's elimination of the architectural façade identified as the "Wave" may not comply with the city of Hayward's General Plan policies pertaining to urban design near an important gateway into the city. Staff has deferred this matter to the city of Hayward for a determination of consistency with the city's General Plan.

INTRODUCTION

On November 17, 2006, the California Energy Commission (Commission) received a Petition to Amend the Commission Decision (Decision) from the Russell City Energy Company, LLC, to move the project from its original site location. The 600 megawatt project was certified by the Commission on September 11, 2002. The project owner is proposing to relocate the facility west of the city of Hayward's Water Pollution Control Facility between Depot Road and Enterprise Avenue.

Staff reviewed the Petition to Amend for the potential to cause significant adverse impacts on visual resources, which are the viewable natural and manmade features in the physical environment. This analysis focuses on those visual aspects of the Russell City Energy Center (RCEC) that would change as a result of the proposed amendment.

The Petition to Amend includes a revised site plan arrangement, and major project structure and building changes, resulting in a substantial change in visual appearance when compared to the original project. The most notable changes from a visual perspective are the elimination of the architectural façade, referred to as the "Wave" in the original project description, that enclosed the heat recovery steam generators (HRSGs) and cooling tower, the architectural treatment that would have been applied to the project's administrative offices, control room, warehouse and water treatment laboratory, and the planting of onsite and offsite landscaping along the edge of the baylands.

The so called "Wave" screening structure (architectural façade), designed by an international architectural firm specializing in the design of power plants and other major infrastructure facilities, was selected in consultation with city of Hayward staff and elected officials. The intent of the screen was to simplify the complexity of the plant's equipment and create a unified visual element with sculptural quality. For the original project, the city found that the "Wave" was both desirable and appropriate for the RCEC considering that it would be highly visible from the Hayward-San Mateo Bridge which the General Plan recognized as an important gateway into the city. In October 2005,

city staff submitted an agenda report to the City Council. In the agenda report, city staff supported the project owner's request to eliminate the "Wave" (COH 2005). However, the City Council made no general plan consistency finding, and took no formal action on the "Wave" at the meeting. In a March 16, 2007 dated letter, Commission staff asked the City of Hayward to provide information on any action by its planning staff, planning commission or City Council to formally consider the consistency of the new Russell City site with regard to the 2002 General Plan policies and Municipal Code requirements. Subsequent correspondence received from the city of Hayward dated April 19, 2007 and May 25, 2007 were silent regarding the elimination of the "Wave" for the amended project.

The project owner proposed an extensive list of offsite measures intended to mitigate the visual impacts of the RCEC project. The measures, which are enumerated in the conditions of certification, include trailside amenities in the Hayward Regional Shoreline, trees planted at the Whitesell Business Park, and trees planted along the warehouse and industrial park complexes that line the eastern edge of the shoreline (see Conditions of Certification **VIS-9** and **VIS-10**).

The Commission certified the RCEC in 2002 for a location near the edge of the baylands where it has high visibility and is at the State Route 92 gateway to Hayward. The Decision recognized that the project owner made a commitment to implement an architectural façade, and provide architectural treatment and landscaping that would increase the project's attractiveness making it a landmark visual element at the city's western entry.

The Energy Commission concluded with the implementation of the conditions of certification, the project would comply with applicable LORS and would not create significant adverse direct or indirect visual impacts, nor would it contribute to significant adverse cumulative visual impacts (CEC 2002b, pg. 234).

The Staff Assessment analyzes the impact the proposed changes to the certified RCEC would have on the visual resources in the vicinity of the project and whether the RCEC as modified would comply with applicable laws, ordinances, regulations and standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

The table below lists all the updated LORS that have been identified as applicable to the visual resources aspects of the proposed amendment. As with the original project site, the new site does not involve federally administered public lands, so the project is not subject to federal regulations pertaining to visual resources. The city of Hayward's General Plan has been updated since the RCEC was certified.

VISUAL RESOURCES Table 1
Laws, Ordinances, Regulations, and Standards

Applicable	Description
Local	
City of Hayward - General Plan	The Hayward General Plan contains applicable policies regarding maintenance and protection of visual resources relevant to the proposed project at this location, and includes promotion of infill development that is compatible with the overall character of the surrounding neighborhood.
City of Hayward - Zoning Ordinance	Land uses within the "Industrial" Zoning District are subject to the "Minimum Design and Performance Standards" which establish requirements for architectural design, fences, signs, outdoor storage, lighting, and landscaping.

SETTING

The project would be built in the western portion of the city of Hayward, north of State Route 92, along the edge of the baylands. The new project site would involve approximately 19 acres in an area designated by the city as an "Industrial Corridor."

The Industrial Corridor involves a 3,500 acre area in western and southern Hayward. For over 40 years, the Industrial Corridor attracted warehouse and distribution facilities. More recently, the Industrial Corridor has attracted high-tech and research and development related firms. Approximately 2,500 acres are currently devoted to industrial uses. Another 600 acres are presently devoted to commercial, residential, or public and quasi-public uses (COH 2002a, pg. 2-12-13).

The new project site borders a bayland area identified as the Hayward Regional Shoreline. The project site's west boundary along the Hayward Regional Shoreline is approximately 980 feet in length. The original project site had an approximate 360-foot border along the regional shoreline (see **VISUAL RESOURCES Figure 1** – Aerial of Project Site and Immediate Vicinity). The original project's west property boundary was visually buffered from the Hayward Regional Shoreline by the Enterprise Distribution Center.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

To determine whether the amendment would cause a potentially significant visual resources impact, Energy Commission staff reviewed the project using the California Environmental Quality Act (CEQA) Guidelines Appendix G Environmental Checklist pertaining to Aesthetics. The checklist questions included the following:

A. Would the project have a substantial adverse effect on a scenic vista?

B. Would the project substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?

C. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

D. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Energy Commission staff evaluated the existing physical environmental setting from a fixed vantage point (called a "Key Observation Point" [KOP]), and the visual change introduced by the amended project to the view from that KOP. **VISUAL RESOURCES Figure 2** shows the locations and view direction of the five KOPs selected for this amendment from the seven KOPs used in the original proceeding. The five KOPs used in this analysis are as follows:

- KOP 1 – Whitesell Business Office Park;
- KOP 2 – Hayward Regional Shoreline Interpretive Center;
- KOP 3 – Hayward Regional Shoreline – Cogswell Marsh Footbridge;
- KOP 4 – State Route 92 at Hayward-San Mateo Bridge Toll Plaza; and
- KOP 7 - State Route 92 Near Clawiter Road (transmission line crossing).

Staff's analysis of the amended project's affect on each KOP in comparison to the original project is presented under **Operation Impacts and Mitigation**. Please refer to **APPENDIX VR-1** for a complete description of staff's Visual Resources evaluation process.

Photographs and simulations from KOP 5 and KOP 6 have not been included as an attachment to this report. The visual change between the original project and the amended project structures is similar to that which was assessed in the Final Staff Assessment for the original project (CEC 2002a). The publicly visible structures on the project site would be unnoticeable from these KOP locations.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The most publicly visible structural components of the amended power plant would include: two 146-foot tall HRSG stacks; two 118-foot tall HRSG units; two 77-foot tall gas turbine inlet air filters; two 62-foot tall by 109-foot long by 39-foot wide steam turbine generator enclosures, and a 60-foot tall by 540-foot long by 60-foot wide 9-cell cooling tower (**VISUAL RESOURCES Figure 3** – Plant Elevation Looking North and East, **VISUAL RESOURCES Figure 4** – Plant Elevation Looking West and South).

A. SCENIC VISTA

CEQA checklist question: "Would the project have a substantial adverse effect on a scenic vista?"

A scenic vista for the purpose of this analysis is defined as a distant view through and along a corridor or opening that exhibits a high degree of pictorial quality. There are no scenic vistas in the KOP 1, KOP 2, KOP 3, KOP 4 and KOP 7 viewsheds. The proposed project would not cause a significant visual impact to a scenic vista.

B. SCENIC RESOURCES

CEQA checklist question: "Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway corridor?"

A scenic resource for the purpose of this analysis includes a unique water feature (waterfall, transitional water, part of a stream or river, estuary); a unique physical geological terrain feature (rock masses, outcroppings, layers or spires); a tree having a unique visual/historical importance to a community (a tree linked to a famous event or person, an ancient old growth tree); historic building; or a designated federal scenic byway or state scenic highway corridor.

In the KOP 2, KOP 3, and KOP 4 viewsheds there is an identified scenic resource. Mount Diablo (elevation 3,849 feet) is located approximately 20 miles northeast of the city of Hayward. It is the highest point in this segment of the East Bay Hills. Mount Diablo is listed number 905 on the California Historical Landmarks and listed NPS-76000526 on the National Register of Historic Places.

Also in the KOP 2, 3 and 4 viewsheds is a bayland area called the Hayward Regional Shoreline, a unique water feature that consists of 1,682 acres that includes salt, fresh, and brackish water marshes, seasonal wetlands and approximately three-miles of the San Lorenzo Trail (**VISUAL RESOURCES Figure 5a** – Landscape Character Photo - Hayward Regional Shoreline Looking Northwest from Hayward Interpretive Center, **VISUAL RESOURCES Figure 5b** – Landscape Character Photo - Hayward Regional Shoreline Looking Northeast from Hayward Interpretive Center, **VISUAL RESOURCES Figure 6** – Landscape Character Photo - Hayward Regional Shoreline Looking East Towards Project Site from San Francisco Bay Trail). The Oliver Salt Ponds within the Hayward Regional Shoreline have been placed on the National Register of Historic Places and is designated a "Rural Historic Landscape[1]. "The salt ponds are maintained as habitat for the Western Snowy Plover, a species listed by the federal government in 1993 as threatened.

The Hayward Regional Shoreline and its trail system provide views of San Francisco Bay, baylands, the East Bay Hills, Coast Range, and Mt. Diablo. Activities at the Hayward Regional Shoreline include hiking, bicycling, jogging, birdwatching, and fishing.

In the shoreline area, efforts over the past 30 years by member agencies of the Hayward Area Shoreline Planning Agency have resulted in the acquisition and restoration of over 3,000 acres. In addition, there are several ongoing projects that will preserve even more of this area as wetlands or upland habitat. Restoration work on the Eden Landing Ecological Reserve (Baumberg Tract) and on the Hayward Area Recreation and Parks District (HARD) Marsh (former Oliver Salt Ponds) when

[1] This distinction applies to lands that were used by people in the pursuit of day-to-day activities and were shaped or modified by their users in response to the forces of nature. In the case of the Oliver Salt Ponds, the flat, windswept salt marshes and their accompanying clay soils were the perfect landscape to manipulate for the ponding of acres of bay water (Hayward Regional Shoreline Interpretive Center).

completed would provide for extension and/or enhancement of the Bay Trail (COH 2002a, pg. 7-1).

The amended project's publicly visible power plant structures would be most visible across the open baylands located to the northwest, west, and southwest of the project site. Individuals who are recreating (e.g., birdwatching, fishing, hiking, trail bike riding) in the Hayward Regional Shoreline would be exposed to highly visible unobstructed views of the project from several locations. Visitors to the Hayward Shoreline Interpretive Center, and motorists on eastbound State Route 92 would also be exposed to an unobstructed view of the project's publicly visible structures. Unlike the original project, the relocated project would be outside of the direct line-of-sight of Mt. Diablo from the Hayward Regional Shoreline Interpretive Center.

In the KOP 2, KOP 3 and KOP 4 viewsheds, there are identified scenic resources. The proposed amended project would not cause a significant visual impact to a scenic resource with the effective implementation of Conditions of Certification **VIS-1** through **VIS-4** and **VIS-8** through **VIS-11** adopted for the original RCEC project by the Energy Commission, and modified by staff herein to reflect the proposed amended project. For further discussion of visual impacts on scenic resources see the discussion for the KOP 2-4 viewsheds below.

C. VISUAL CHARACTER OR QUALITY

CEQA checklist question: "Would the project substantially degrade the existing visual character or quality of the site and its surroundings?"

Construction Impacts and Mitigation

Construction activities for the project would occur during an approximate 24-month period with an estimated commercial operation start date being June 1, 2010. Main activities that would be ongoing on the power plant construction site during the construction period include: the installation of the HRSG enclosures and power train foundations, erecting of the HRSG, the installation of pipe supports, liner plates and baffles and aboveground electrical, exhaust stack fabrication and condenser work, the installation of the cooling tower, aboveground tanks and prefabricated buildings. In addition, during the construction period, construction materials, heavy equipment, trucks, modular offices, and parked vehicles would have limited public visibility on the temporary construction laydown area due to automobile salvage yards obstructing ground level views to north and east of the project site, and the city's wastewater treatment facility to the south.

Typically screening of onsite construction activities is accomplished by attaching a fabric or adding wooden slats to a perimeter fence. This screening is effective in limiting ground level visual exposure of the construction site. This type of screening may be necessary along the project site's west boundary because there is an unobstructed view from the baylands and southern San Francisco Bay. Individuals recreating in the baylands would have an unscreened view of the project's onsite ground level structures during the construction period. Condition of Certification **VIS-1** found in the Decision currently requires the erecting of a 12-foot-tall fence with opaque, solid slates along the southwest corner of the site (the corner of the original project site that bordered the

Hayward Regional Shoreline). The original **VIS-1** condition requiring construction site screening has been modified by staff to reflect the proposed project site (see **Proposed Amended And Proposed Conditions of Certification**).

During pipeline construction, the ground surface along the proposed alignments would be temporarily disrupted by the presence of construction equipment, excavated piles of soil, concrete and pavement, and construction personnel and vehicles. After construction, the ground surfaces would be restored. The restored ground surfaces and buried pipelines would not create a change to the existing visual condition. The original Condition of Certification **VIS-1** includes restoration of ground surfaces affected by construction activities.

Construction activities would not result in a long-term visual degradation. Overall, the project's proposed construction activities with the effective implementation of mitigation would generate a less than significant visual effect.

Operation Impacts and Mitigation

KOP 1- Whitesell Business Office Park

VISUAL RESOURCES Figure 7 shows the existing view towards the new project site from the parking lot of the Whitesell Business Office Park. The KOP 1 location is from the closest building to the project site near a rear entrance and an outdoor patio area. The KOP 1 location is approximately 1,675 feet southeast of the project site. **VISUAL RESOURCES Figure 8** depicts a photo simulation of the amended project's publicly visible structures after completion of construction from the KOP 1 location. For comparison, **VISUAL RESOURCES Figure 9** depicts a photo simulation of the original project from KOP 1. **VISUAL RESOURCES Figure 10** shows the original project's proposed architectural facade - "The Wave."

With the relocation of the project, the high visual contrast and dominance of the original project would be substantially reduced as seen from the KOP 1 area, to the degree that the adverse visual impact would not be considered significant and not require mitigation. Originally, to increase the effectiveness of onsite landscaping, as viewed from KOP 1, Measure 2 of Condition of Certification **VIS-10** required landscaping to be planted offsite in the empty tree wells of the Whitesell Business Park parking lot and near the buildings and outdoor patio area. Staff does not believe Measure 2 is necessary for the amended project and recommends that it be deleted from **VIS-10**.

The project owner has requested the deletion of Condition of Certification **VIS-7** because the project no longer borders Whitesell Street and Enterprise Avenue. The original project buildings were highly visible to motorist on these streets and to viewers at the Whitesell Business Park. The new site location and arrangement for the administrative offices and control room, warehouse, and water treatment laboratory would no longer be sited adjacent to or directly visible from a public street. The proposed site plan shows the administrative offices/control building and the water treatment laboratory would be located approximately 650 feet and about 400 feet northwest of the end of Enterprise Avenue respectively, and northwest of the sewage treatment pond at the city's wastewater treatment facility. The proposed warehouse would be located about 585 feet south of Depot Road. The applicant has proposed to

construct a sound wall along the south property line on the proposed site. The sound wall would help visually soften the view of buildings from public view and other structures. The existing automobile salvage yards that front Depot Road provides a visual buffer to the north of the project site. Staff does not believe that Condition of Certification **VIS-7** is necessary and recommends that it be deleted.

KOP 2 – Hayward Regional Shoreline Interpretive Center

KOP 2 is located on the observation deck of the Hayward Regional Shoreline Interpretive Center. **VISUAL RESOURCES Figure 11** shows the existing view from the Hayward Regional Shoreline Interpretive Center towards the proposed project site. **VISUAL RESOURCES Figure 12** depicts a photo simulation of the amended project from the KOP 2 location. For comparison, **VISUAL RESOURCES Figure 13** depicts a photo simulation of the original project from this location.

In the project's original location it was in the direct line-of-sight of Mt. Diablo from the observation deck of the Hayward Regional Shoreline Interpretive Center and would have substantially blocked the mountain from view. To mitigate this impact, Condition of Certification **VIS-9** required the project owner to install benches, an information kiosk, information panels, and free-of-charge viewscopes at two nearby locations on a Shoreline trail where views toward Mt. Diablo would not be affected by the project. The trailside amenities would enhance views of Mt. Diablo from the KOP 2 viewshed, compensating for the view that would be lost from the deck of the Interpretive Center.

In its new location, the RCEC would not be in direct line-of-sight of Mt. Diablo from the Interpretive Center. Although the relocated project would not block views of Mt. Diablo from KOP 2, the project owner is still willing to provide the trailside amenities. Staff is supportive of the modifications to **VIS-9** proposed by the project owner.

With the removal of the "Wave" architectural façade, the power plant would now appear more overtly industrial than before. In addition it would be larger and more industrial appearing than the smaller scale rectangular warehouse type structures now visible along the eastern edge of the baylands. The proposed project would alter the character of the KOP 2 viewshed, making it appear more intensively industrial developed. The amended project's vertical HRSGs and stacks and the long, horizontal cooling tower would create a visually dominant element in the landscape along the regional shoreline's eastern fringe that would stand out because of its large scale, and its contrast with the setting.

To mitigate for the original project's highly contrasting and dominating structures in the KOP 2 viewshed, the project owner proposed planting landscaping both onsite and offsite. Due to the original project site's proximity to the Regional Shoreline marsh and concerns of the U.S. Fish & Wildlife Service over tall trees providing perching opportunities for birds of prey, the height and type of landscaping was limited. Because onsite landscaping alone would not mitigate the visual impacts of the project, Calpine proposed Measure 3 in their Visual Mitigation Plan. Measure 3 (Condition of Certification **VIS-10**) called for the planting of a row of evergreen trees along the west edge of the Industrial Corridor, starting at the warehouse complex to the west of the original RCEC site and continuing southerly along the parking lot of the Whitesell

Business Park. Additional trees were to be planted on an existing berm from Breakwater Avenue north to Johnson Road to screen from view some of the unsightly industrial uses near SR 92 (see **VISUAL RESOURCES Figures 14 and 15**). The trees would be planted relatively close together to create a dense screen and arranged in informal patterns with occasional breaks to impart a more natural appearance. The intent of the offsite landscaping was to compensate for the project's visual contrast with and dominance in the setting, by reducing the visibility of other highly contrasting and dominating structures in the KOP 2 viewshed. The city of Hayward was supportive of the offsite landscaping proposal and nearby landowners provided letters agreeing to allow landscaping on their properties (CEC 2001a, Visual Resources Appendix VR-5). The Petition to Amend states that "because travelers along State Route 92 south of the project site, Whitesell Business Park, and Whitesell Street will no longer have an unimpeded view of the project," Condition of Certification **VIS-10** should be eliminated. However, as discussed above, the intent of Measure 3 was not to address these viewers, but to mitigate the project's visual contrast and dominance introduced into the KOP 2 viewshed (regional shoreline).

The project owner is now proposing to identify locations within the marsh where landscaping can be planted to reduce the impact to KOP 2, because they say there are limited opportunities on the new project site to plant trees due to pipeline easements associated with the city's sewage treatment plant. Staff does not believe planting in the marsh would be acceptable from a biological resources perspective. Staff believes that the U.S. Fish & Wildlife Service would still have the same concerns about tall trees being planted.

With the elimination of the architectural façade and the offsite landscaping, the project would appear more industrial and would introduce to the KOP 2 viewshed a strong industrial character. The visual impact of the amended project would be significant and require mitigation. Therefore, staff believes Measure 3 of **VIS-10** should remain a part of the Decision. Staff disagrees with the project owner's modifications to **VIS-2** and deletion of **VIS-10**.

KOP 3 – Hayward Regional Shoreline - Cogswell Marsh Footbridge

VISUAL RESOURCES Figure 16 shows the existing view within the Hayward Regional Shoreline from the footbridge that crosses Cogswell Marsh towards the project site, approximately one mile away. **VISUAL RESOURCES Figure 17** depicts a photo simulation of the amended project as it would be seen from the KOP 3 location. For comparison, **VISUAL RESOURCES Figure 18** depicts a simulation of the original project.

From KOP 3, the original project was located behind an existing industrial park. The relocated project would now occupy a portion of the view that currently has an open view from the baylands. As a consequence, the area of development along the bayland edge would be substantially extended. Without the architectural facade, the project would now appear more industrial, imparting a strong industrial character on the KOP 3 viewshed. As discussed above for KOP 2, Measure 3 of Condition of Certification **VIS-10** should remain a part of the Decision to compensate for the project's visual contrast with and dominance in the KOP 3 viewshed.

KOP 4 – State Route 92 at Hayward-San Mateo Bridge Toll Plaza

VISUAL RESOURCES Figure 19 shows the existing view from State Route 92, near the toll plaza at the east end of the Hayward San Mateo Bridge, approximately 1.5 mile southwest of the project site. The figure represents a view of the project site that would be seen by eastbound motorists. **VISUAL RESOURCES Figure 20** depicts a simulation of the amended project as it would be seen from KOP 4. **VISUAL RESOURCES Figure 21** depicts a simulation of the original project from this viewpoint.

For the original project, the city of Hayward believed that the architectural facade was both desirable and appropriate for the RCEC considering that it would be highly visible from the Hayward-San Mateo Bridge. The city's General Plan identified the Hayward-San Mateo Bridge as an important gateway into the city and that the appearance of structures at the bridge entrance should contribute to the character of the baylands. City Manager Jesus Armas, in a 2001 letter to the Energy Commission, stated that "the "Wave" structure would relate to the baylands in the sense that the bay tides transport vital nutrients used by shoreline plants and animals" (Armas 2001). In this letter, the city insisted that the architectural facade for the project be unique and distinctive and believed that the "Wave" structure would fulfill this objective.

In a 2005 agenda report to the City Council, City Manager Armas recommended that the city of Hayward exchange property with Calpine so they could build the amended RCEC project on the current site. In the report, city staff wrote that they supported Calpine's request to eliminate the "Wave" structure, because "the new location makes the RCEC less visible to motorists entering Hayward via Route 92, which was the main reason the screen was incorporated in the original design" (COH 2005, pg. 2). The Council resolution does not specifically address eliminating "the Wave" from the project. Energy Commission staff disagrees that the relocated project would be less visible from State Route 92 (for comparison purposes see **VISUAL RESOURCES Figures 20 and 21**).

Staff defers to the city on the use of an architectural façade for the power plant and its consistency with local LORS. However because the project would now appear, as the Petition to Amend acknowledges, more overtly industrial and would make the view from State Route 92 appear more intensely developed and more industrial, staff believes that the requirement for offsite landscaping (Measure 3 of Condition of Certification **VIS-10**) should not be deleted as recommended by the project owner because it potentially will result in a significant visual impact under CEQA.

KOP 7 - State Route 92 Near Clawiter Road Overpass (transmission line crossing)

VISUAL RESOURCES Figure 22 shows the existing view from State Route 92, near the Clawiter Road highway overpass approximately one mile south of the project site. **VISUAL RESOURCES Figure 23** depicts a simulation of the original project's transmission line crossing of State Route 92 as seen by eastbound motorists.

The original RCEC transmission overhead transmission route involved use of a 230-kV double-circuit overhead transmission line supported by 110 to 125-foot tall tubular steel poles that were to run parallel to the existing Grant-Eastshore 115-kV transmission line connecting to the PG&E Eastshore substation. The transmission line route traversed

industrial properties in the city's Industrial Corridor. The most publicly visible segment of the transmission line was its crossing over State Route 92.

The new RCEC project would also interconnect to the Eastshore substation by use of a double circuit 230 kV line with 120-foot tall tubular steel poles. The length of the transmission line would be either 1.33-miles or 1.21-miles depending on the selected alternate route. Alternative 1 would start at the RCEC switchyard on the project site, extend north to Depot Road where it would go underground and travel eastward along Depot Road until reaching the Grant-Eastshore corridor, where it would come back up above ground and travel overhead on a set of new towers until reaching the Eastshore substation. Alternative 2 would start at the RCEC switchyard, and then travel east along the north boundary of the city's wastewater treatment facility until reaching the Grant-Eastshore transmission corridor, which it would then follow to the Eastshore substation (RC 2006a, pg. 3-165). The amended project's transmission line would also cross industrial properties in the city's Industrial Corridor and State Route 92 at the same location as the original project proposed.

The visual change caused by the amended project's overhead transmission line alternatives at KOP 7 would be similar to that which was assessed in the Final Staff Assessment for the original project (CEC 2002a).

Visible Water Vapor Plumes

The RCEC's potential to emit visible water vapor plumes from its cooling tower and HRSG stacks was a concern in the original proceeding given the project's visibility from State Route 92 across the open baylands. To reduce visual impacts, the project owner proposed a plume-abated cooling tower and an economizer bypass system capable of raising the temperature of the HRSG exhausts to limit plumes from the stacks. The project owner has requested a modification to Condition of Certification **VIS-8** deleting the portion of the condition to abate the HRSG plumes. The major requested changes to the HRSG design and/or exhaust conditions include the following: 1) elimination of the economizer bypass system, 2) increase of the unabated exhaust temperatures from 170 degrees Fahrenheit (F) to a value ranging from 180-199 degrees F; and, 3) elimination of the steam injection power augmentation. The Petition to Amend states that use of an economizer bypass system and maintaining an exhaust temperature of 270 degrees F would be very inefficient in terms of the use of natural gas resources.

Staff conducted plume frequency modeling of the project owner's new HRSG design and operation (see **APPENDIX VR-2**). The elimination of the steam injection and raising of the unabated exhaust temperatures has kept the plume formation potential similar to that modeled for the original case and well below staff's publicly visible plume impact study threshold of 20 percent of seasonal daylight clear hours. Due to their very low frequency of occurrence (3.4% plume frequency with duct firing), the HRSG plumes would not cause a significant visual impact. The project owner is not proposing any changes to the plume-abated cooling tower, so staff's original plume modeling analysis remains valid. Therefore, staff accepts the project owner's proposed changes to Condition of Certification **VIS-8**. For a discussion on plume formation as they relate to air navigation safety refer to the **Traffic and Transportation** section of this Staff Assessment.

CUMULATIVE IMPACTS AND MITIGATION

As defined in Section 15355 of the CEQA Guidelines (California Code of Regulations, Title 14), a cumulative impact is created as a result of the combination of the project under consideration together with other existing or reasonably foreseeable projects causing related impacts. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. In other words, while any one project may not create a significant impact to visual resources, including visible water vapor plumes, the combination of the new project with all existing or planned projects in an area may create significant impacts. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) views of a scenic resource is impaired; or (3) visual quality is diminished.

Changes to baseline land use information involved the annexation by the city of Hayward of the project site. In March 2007, three parcels were annex into the city of Hayward as part of Phase I of the city's Mt. Eden Annexation process. The parcels were part of the Depot Road Island. The Depot Road Island area has been prezoned "Industrial" by the city of Hayward, consistent with the zoning designations of surrounding properties within the city limits. Other nearby county lands planned for annexation into the city of Hayward have also been prezoned for industrial use. The project site would become part of the city's West Industrial Planning Area portion of the Hayward Industrial Corridor.

The project as amended no longer involves the use of an architectural façade. The amended RCEC would introduce publicly visible structures that would be highly visible along the edge of the Hayward Regional Shoreline that would contribute to the existing contrast of other offsite structures and buildings in the KOP 2, 3, 4 viewsheds. The project's contrast in the viewshed would not be overlooked and would be dominate in the landscape, and contribute significantly to a cumulative impact requiring mitigation. To reduce the original project's high contrast and dominance, the project owner provided Measure 3 in their Visual Mitigation Plan. Measure 3 provides for the planting of trees along the western edge of the Industrial Corridor to screen views of the industrial buildings and structures in the immediate vicinity of the original project site. This would reduce the visibility of other highly contrasting offsite structures in the KOP 2, 3 and 4 viewsheds to compensate for the project's visual contrast with and dominance in the setting.

Properties to the north of the facility are used as auto salvage yards, and a business park. The Hayward Wastewater Treatment Plant is to the east. While project-related nighttime light and daytime glare impacts on the project site would be mitigated to a level that would be less than significant, existing light and glare levels in the vicinity of the project would increase cumulatively as a result of the project and the existing and planned land uses involved in the Mt. Eden annexation area associated projects. Light and glare impacts generated by these proposed projects are not anticipated to be cumulatively considerable if they are mitigated according to CEQA and the city's Municipal Code requirements.

A potential development project east of the project site is the Eastshore Energy Center (EEC). On September 22, 2006, an Application for Certification was filed with the

Energy Commission to construct and operate a 115 MW peaking plant on approximately 6 acres located 3,000 feet east of the Amendment No. 1 project site. The EEC would not be seen or noticed from the KOPs.

Staff has reviewed Census 2000 information (maps) that shows a minority population greater than fifty percent within a six-mile radius of the proposed power plant, and a low income population less than fifty percent within the same radius (see the **Socioeconomics** section of this Amendment, and **SOCIOECONOMICS Figure 1**). **SOCIOECONOMICS Figure 1** shows that an identified minority population may potentially have a limited exposure to the project's publicly visible structures and lighting. Staff has determined that all significant direct or cumulative impacts specific to visual resources resulting from the construction or operation of the project will be mitigated. Therefore, the proposed project would not introduce a significant visual resources related environmental justice issue(s).

Staff concludes that the effective implementation of the conditions of certification found in the original RCEC project's Decision as amended by staff to reflect the current project site and project configuration would reduce the amended project's cumulative visual impacts to a less than significant level in the KOP 2, 3, and 4 viewsheds.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Table 2 presents the original project's LORS consistency table found in the RCEC FSA (originally Table 5) updated to reflect the amended project's consistency with visual resources related LORS. Staff used ~~strikeout~~ to show deleted text and, **bold and underlined** to show new text inserted.

VISUAL RESOURCES: Table 2
Proposed Project's Consistency with
Local LORS Applicable to Visual Resources

LORS		Consistency Determination	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
City of Hayward General Plan			
City Image *("City Image" policy section of the 1986 General Plan reviewed by staff during the original proceeding has been incorporated into Chapter 1 - Land Use, and Chapter 7 – Conservation and Environmental Protection in the*	The land use policies and design regulations of the City would be used to shape development in ways consistent with the desired city character. • Establish site plan review standards which seek to preserve vistas, significant natural features, drainage and solar access, and which provide for continuity of bike and pedestrian ways or trails (Strategy #6).	~~NO~~ **YES AS PROPOSED**	The background discussion in the City Image Chapter of the General Plan states that views of the hills from the shoreline and bay plain are central to Hayward's physical image. ~~The project would not preserve a scenic vista since it would nearly block the entire view of Mt. Diablo currently available from the Hayward Shoreline Interpretive Center, which was designed to provide vista views across the open baylands.~~ **The relocated project would not block the view of Mt. Diablo from the observation deck of the Hayward**

LORS		Consistency Determination	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
city's 2002 General Plan)			**Interpretive Center. In addition, the project owner agrees to** ~~implementation of~~ **implement** condition of certification **VIS-9, which** would result in the installation of new interpretive facilities within the shoreline area to ~~compensate for the view that would be lost from the Interpretive Center. Implementation of **VIS-9** would~~ enhance shoreline visitors' appreciation and understanding of Mt. Diablo ~~and would bring the project into conformance with this General Plan strategy~~
Urban Design *("Urban Design" policy section of the 1986 General Plan reviewed by staff during the original proceeding has been incorporated into Chapter 1 - Land Use, and Chapter 7 – Conservation and Environmental Protection in the city's 2002 General Plan)*	• Enhance entrances to Hayward with distinctive planting, signing or architecture (Strategy #2).	~~YES~~**/UNKNOWN DEFERRED TO CITY**	The City of Hayward ~~believes~~ **believed** that **the** architectural ~~treatment~~ **façade was** ~~is~~ both desirable and appropriate for the RCEC considering that it would be highly visible from the Hayward-San Mateo Bridge which the General Plan recognizes as an important gateway into the City. The Urban Design Chapter of the General Plan ~~states~~ **stated** that City entrances should be signified by suitable landmarks or entry features and ~~suggests~~ **suggested** that windmills on the baylands near the San Mateo bridge would provide a memorable entrance to the City. The General Plan ~~expresses~~ **expressed** concern about the visual appearance of structures at the bridge entrance to the City and ~~states~~ **stated** that visible structures should contribute to the character of the baylands. The "Wave" structure would relate to the baylands in the sense that the bay tides transport vital nutrients used by shoreline plants and animals. The City ~~"insists"~~ **insisted** that the architectural ~~treatment~~ **façade** for the project be unique and distinctive and ~~believes~~ **believed** that the proposed "Wave" ~~fulfills~~ **fulfilled** this objective ~~(Armas 2001)~~. **In an agenda report to the City Council in October 2005, City staff supported Calpine's request to eliminate the "Wave" structure. The City did not make a general plan consistency finding in the agenda report for this action. The City Council took no formal action on the "Wave" during the meeting.**
City of Hayward Zoning			

LORS		Consistency Determination	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
Ordinances			
• Section 10-1.1630 Yard Requirements	Minimum Front Yard (Standard Street): 10 feet Minimum Side Yard: None Minimum Side Street Yard: 10 feet Minimum Rear Yard: None	YES **AS PROPOSED**	As depicted on the site plan, the ~~project proposes 20-foot wide property line setbacks along Whitesell Street and Enterprise Avenue (Calpine/Bechtel 2001a). The~~ project would comply with the yard requirements.
• Section 10-1.1635 Height Limit	Maximum building height: • Industrial building: No Limit • Office building: 40 feet Maximum height for fences, hedges, walls: (1) Front and street yard: 4 feet (2) Side and Rear Yard: No Limit	~~NO~~ **YES AS PROPOSED AND YES AS CONDITIONED**	The project would comply with the building height provisions since there are no limitations for industrial buildings and the office-like buildings, such as the warehouse/maintenance office and administration building/control building, would be 25 feet tall. ~~As depicted on the conceptual landscaping plan (Calpine/Bechtel 2001b) a 6-foot tall solid-wood fence would be located within the street yard along Whitesell Street , inconsistent with the 4-foot maximum height for fences.~~ Condition of certification **VIS-5** would ensure compliance with ~~this~~ **the City's** standard **pertaining to the maximum height for fences, hedges and walls.**
• Section 10-1.1640 Site Plan Review	Site Plan Review approval is required before issuance of any building, grading, or construction permit within this district only if the Planning Director determines that a project is incompatible with City policies, standards and guidelines. Site Plan Review approval may also be required for fences (i.e., such as anodized gray chain link fences along corridor streets) in certain circumstances.	~~UNKNOWN~~ **YES AS CONDITIONED**	Staff's proposed conditions of certification for **onsite** landscaping (**VIS-2**), structural treatment (**VIS-3**), fences and walls (**VIS-5**), signs (**VIS-6**), and ~~architectural treatment (**VIS-7**)~~ **offsite landscaping** (**VIS-10**) allow for review and comment by the City of Hayward.
•Section 10-1.1645 Minimum Design and Performance Standards (Industrial Buildings and Uses)	This section establishes design and performance standards that shall apply to the construction of industrial and commercial buildings and uses in the (I) Industrial District. The applicable standards pertinent to visual resources are summarized below		
	a. Accessory Buildings, Detached. Shall not exceed one story (1).	YES **AS PROPOSED**	The warehouse/maintenance shop, administration building/control room, and water treatment building/laboratory would not exceed one story.
	f. Architectural Design Principles. • Incorporate design elements that		• The ~~architectural~~ **surface** treatments proposed for the power

LORS		Consistency Determination	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
	are harmonious and in proportion to one another (1). • Incorporate an attractive mixture of color and materials. Select building materials and colors that are harmonious with the site and surrounding uses, buildings and area. Base colors shall be low reflective, subtle, neutral. Building trim may feature brighter accent colors (2). • Create shadow relief with recesses, columns, score lines, trellises, windows, or other features on blank wall when they are visible from adjacent streets (4). • Building facades in excess of 100 feet long and/or greater than 20 feet in height shall be setback a minimum of 20 feet from the front property line and must incorporate recesses and projects, which may include windows and trellises (5). • New buildings shall use roof parapet walls to screen rooftop mechanical equipment (6). • Any metal clad building which is visible from a street shall adhere to these design criteria. Unpainted (gray galvanized) metal surfaces shall not be used on primary structures (7). • Truck loading areas shall not face the street, unless no practical alternative exists (8). • Industrial facilities, whose building design is utilitarian by necessity, shall be screened with landscaping (9)	**YES AS CONDITIONED AND** YES **AS PROPOSED**~~/ UNKNOWN~~	plant and cooling tower are harmonious with one another. (1) • Condition of certification **VIS-3** would ensure that building materials and colors would be harmonious with the site and surrounding area. (1, 2) • The one-story buildings containing the facility's administrative offices, warehouse, and water treatment laboratory **would not front on any public road and would be set back in excess of twenty feet from Depot Road.** ~~and fronting on Whitesell Street would be set back about 60 feet from the property line. The project owner has committed to providing if architectural treatment to these buildings consistent with the design guidelines. Conformance with these principles would be ensured by condition **VIS-7**.~~ **The project owner has requested that VIS-7 be deleted. Staff supports the requested modification because the project's administrative offices, warehouse, and water treatment laboratory would not be visible from Whitesell Street, Enterprise Avenue and Depot Road.** (4) (5) (6) • Truck loading areas would not face the street. (8) • The proposed landscaping would partially screen the power plant structures. (9)
	i. Fences, Hedges, Walls. • Fences, hedges and walls shall not exceed a height of 4 feet in a required front yard, or side street yard (1). • For fences limited to a maximum of 4 feet in height, the height limit shall not be exceeded at grade measured on either side of the fence (3).	~~NO~~ **YES AS CONDITIONED**	~~As depicted on the conceptual landscaping plan, a 6-foot tall solid-wood fence would be located within the street yard along Whitesell Street, inconsistent with this standard. The City has indicated that decorative masonry walls should be located along Enterprise Avenue and Whitesell Street (Ameri 2001).~~ **Proposed project fencing is shown on the site plan to be outside the front yard area. The project does not have a side yard area that borders a street.** Condition of certification **VIS-5** would ensure compliance with this standard.

LORS		Consistency Determination	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
	l. Landscaping. • Landscape Areas. Required front, side, side street, and rear yard areas shall be landscaped except for permitted driveways, and walkways. All other areas not utilized for structures or paving shall be landscaped unless otherwise authorized by the Planning Director or other approving authority because of site constraints, existing or adjacent site conditions, or phased development (a). Required landscape areas shall be planted with water conserving trees, shrubs, turf grass, ground cover, or a combination thereof (c). • Buffer Trees/Landscaping. Masonry walls, solid building walls, trash enclosures, and/or fences facing a street or driveway shall be buffered with continuous shrubs or vines (b). • Parking Lot Trees/Planters. Parking areas shall include a minimum of one 15-gallon parking lot tree for every 6 parking stalls, unless an alternative tree planting is approved by the City Landscape Architect (a). Parking and loading areas shall be buffered from the street with shrubs, walls, or earth berms. Where shrubs are used for buffering, the type and spacing of shrubs shall create a continuous 30-inch high screen within 2 years (e). • Street Trees. Street trees shall be planted along all street frontages at a minimum of one 24-inch box tree per 20 to 40 lineal feet of frontage or fraction thereof, except where space is restricted due to existing structures or site conditions. • Irrigation. Within all required landscaped areas, an automatic water efficient irrigation system shall be installed upon initial construction of any building or substantial alteration to any building or site.	YES **AS CONDITIONED**/ ~~UNKNOWN~~	~~• Landscape Areas. Landscaping, consisting of a mixture of fast-growing evergreen trees, shrubs, and groundcovers, is proposed within the required front and side street yards.~~ ~~• Buffer Trees/Landscaping. Rows of shrub-type trees are proposed in front of the fences along Whitesell Street and Enterprise Avenue. The City believes that the shrub massing, variety and spacing is inadequate as shown on the conceptual landscape plan, and suggests using large shrubs (Ameri 2001).~~ **The project owner has indicated that due to constraints caused by underground pipelines associated with the City's waste water treatment facility, the planting of yard area landscaping in the rear and side yard areas would be difficult. The City Planning Director or other approving authority may grant relief from the strict application of the landscape areas provision. An alternative the City has suggested is that the project owner provides landscaping on an earthen berm and/or wall. (a) (c)** • Parking Lot Trees/Planters. No trees are proposed within the parking lot. City ~~has indicated that~~ **requires** one parking lot tree for every 6 parking stalls ~~is needed (Ameri 2001).~~ **c**onsistent with the **City** standards~~, the parking area along Whitesell Street would be buffered from the street by a continuous screen of White Oleander that would range in height from 2-4feet at planting~~. ~~• Street Trees. Consistent with the standards, the proposed street trees along Enterprise Avenue and Whitesell Street shown on the conceptual landscape plan are 24" box, and would be planted 30 feet on center.~~ ~~• Irrigation. The conceptual landscape plan indicates that a water efficient irrigation system would be installed.~~ ~~• Maintenance. Procedures for maintenance of the landscaping are not specified on the conceptual landscape plan or in the AFC.~~ Condition of certification **VIS-2** would

LORS		Consistency Determination	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
	• Maintenance. After initial installation, all plantings shall be maintained in a reasonably weed-free and litter-free condition, including replacement where necessary (a). Required street, parking lot, and buffer trees shall not be severely pruned, topped, or pollarded (cut back to the trunk) (b).		ensure compliance with the City's landscaping requirements, and that landscaping is installed and maintained in a manner acceptable to the City.
	m. Lighting, Exterior. Exterior lighting and parking lot lighting shall be provided in accordance with the Security Standards Ordinance and be designed by a qualified lighting designer and erected and maintained so that light is confined to the property and would not cast direct light or glare upon adjacent properties or public rights-of-way.	YES **AS CONDITIONED**~~/ UNKNOWN~~	The project owner has proposed measures to control light trespass outside the boundaries of the project. The information provided in the AFC **or Amendment No. 1 Petition** does not allow a determination that the lighting conforms to the Security Standards Ordinance. Condition of certification **VIS-4** would ensure compliance with this standard.
	n. Outdoor Storage. All uses shall be conducted wholly within enclosed buildings. Minor open storage is a secondary use and is permitted, provided the materials, products, or equipment stored are necessary to the operation of the use being conducted on the site. Storage shall not be placed within required yard or parking areas, and the storage shall be compatible with adjoining uses (for example, adequately screened, set back or not too high, and not visually unpleasant).	YES **AS PROPOSED**	Storage would occur within enclosed buildings and tanks. No storage is proposed within required yards or parking areas.
	q. Roof-Mounted Equipment. Roof-mounted equipment, antennas, satellite dishes, support structures and similar devices shall be screened from public view, preferably by the roof form.	YES **AS PROPOSED**~~/ UNKNOWN~~	The elevation drawings provided in the AFC **or Amendment No. 1 Petition** do not depict equipment mounted on the roofs of the proposed buildings. ~~Conformance with this requirement would be ensured by condition of certification **VIS-7**.~~
	r. Signs. Signs shall be of a design in harmony with the environment and shall not constitute excessive visual impact.	YES **AS CONDITIONED**~~/ UNKNOWN~~	No signs are depicted on the site plan ~~or conceptual landscaping plan~~. **The project owner may decide to use a sign to identify the facility.** Condition of certification **VIS-6**, would ensure compliance with this provision.
	t. Trash and Recycling Facilities. Trash and recycling facilities shall be adequately screened from view, utilizing a decorative wood or masonry wall or combination	YES **AS PROPOSED**	No trash facilities are depicted on the site plan. ~~However, the extensive landscaping proposed along the perimeter of the site~~ **In addition, the proposed perimeter fencing and**

LORS		Consistency Determination	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
	thereof.		**sound wall** would sufficiently screen any proposed trash facilities.
	u. Truck Loading Facilities. Loading areas should not dominate the street frontage, and should not directly face a major street unless no practical alternative exists.	YES **AS PROPOSED**	The ammonia truck unloading area would be located a sufficient distance from **a public street** ~~Enterprise Avenue and Whitesell Street~~ so as not to dominate the street frontage.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

City of Hayward

A letter dated April 19, 2007 was received from David Rizk, Planning Manager for the city of Hayward (docketed April 23, 2007), pertaining to the Russell City Energy Center and Eastshore Energy Center projects. Mr. Rizk states to reduce visual and aesthetic impacts, landscape screening, which could include landscaping with a berm and/or wall, should be provided. The use of a perimeter wall to screen lower level plant facilities would also be appropriate. He does not feel that the stacks can be mitigated to an insignificant level, though their impact could be mitigated somewhat if they were more of a neutral color that would blend with the background. Finally, lighting provided should meet the city's Security Ordinance standards, with light sources shielded so as not to shine or glare offsite.

Staff response – Staff has recommended Conditions of Certifications **VIS-2**, **VIS-3**, **VIS-4**, **VIS-5** and **VIS-10** which address the city of Hayward's comment. Specifically regarding the exhaust stacks, **VIS-3** requires the project owner to treat all project structures and buildings visible to the public in appropriate colors or hues that minimize visual intrusion and contrast by blending with the landscape.

A letter dated May 25, 2007 was received from David Rizk. The letter offered specific conditions that the city of Hayward would consider if they were the permitting agency for the proposed project. The city recommended two visual related conditions for the proposed project.

1. A landscape plan be developed and submitted to the city of Hayward for review and comment/approval.

Staff response - Staff has recommended conditions of certification **VIS-2** and **VIS-10**. These conditions address the city of Hayward's comment.

2. The proposed sound wall to be constructed along the southern property line is to be of a neutral, non-reflective color.

Staff response - Staff has recommended condition of certification **VIS-5** for the project**.**

CONCLUSIONS AND RECOMMENDATIONS

The visual analysis focused on two main issues; (1) would construction and operation of the project as amended cause visual impacts under CEQA; and (2) would it comply with applicable local LORS.

1. The project is to be constructed in the “Industrial Zone” district within the “Industrial Corridor” of the city of Hayward in Alameda County.

2. The project site does not have frontage, or traverse a segment of road recognized as a National Scenic Byway or All American Road, or a State Scenic Highway.

3. The project would generate a less than significant visual impact to the viewsheds at the selected key observations points with the effective implementation of visual mitigation measures originally adopted by the Energy Commission and modified to reflect the project on the current site.

4. The project would not substantially degrade the existing visual character or quality of the site and its surroundings with the effective implementation of the conditions of certification.

5. The project would generate a less than significant new source of light or glare to nighttime or daytime views with the effective implementation of the conditions of certification.

6. The project’s publicly visible water vapor plumes generated by its gas turbines/HRSG exhaust are expected to occur infrequently and, are predicted to be well below the 20 percent plume frequency threshold of seasonal daylight clear hours (3.4 percent plume frequency with duct firing). This very low occurrence frequency would be considered to have a less than significant visual impact.

7. The project’s publicly visible structures may potentially be seen by an identified minority population of greater than fifty percent. Staff has determined that all significant direct, indirect or cumulative impacts specific to visual resources resulting from the operation of the project will be mitigated. Therefore, the proposed project does not introduce a significant visual resource related environmental justice issue(s).

8. With the effective implementation of the mitigation measures that the project owner has agreed to, and the visual resource conditions of certification in the Decision, as modified, the project would not have a substantial adverse effect on a scenic vista or a scenic resource.

9. With the effective implementation of the mitigation measures, and the conditions of certification in the Decision, as modified, the construction and operation of the project would not contribute significantly to a cumulative visual impact.

10. The project may not comply with all applicable local laws, ordinances, regulations, and standards pertaining to maintenance and protection of visual resources.

Specifically, the project's elimination of the architectural façade identified as the "Wave" may not comply with the city of Hayward's General Plan policies pertaining to urban design near an important gateway into the city.

The construction and operation of the project, with the effective implementation of the mitigation measures identified by the project owner and staff's recommended conditions of certification (below), would not cause any direct, indirect or cumulative adverse visual resource impacts, and with one possible exception would comply with applicable LORS pertaining to visual resources.

PROPOSED AMENDED AND PROPOSED CONDITIONS OF CERTIFCATION

Staff has proposed modifications to the original RCEC visual resources conditions of certification as shown below (Note: deleted text is in ~~strikethrough~~, new text is underlined).

VIS-1 The project owner shall ensure that implementing the following measures adequately mitigates visual impacts of project construction:

- Install opaque, solid slats in the chain link fence along the RCEC site's boundary along the Hayward Regional Shoreline ~~with Whitesell Street~~. Erect a 12-foot-tall fence with opaque, solid slats along the ~~southwest corner~~ west property boundary of the site~~, starting at a point in line with the fence along the north boundary of KOP 1, and extending to the warehouse building to the west of the RCEC site~~.
- Staging, material, and equipment storage areas, if visible from public rights-of-way, shall be visually screened with opaque fencing.
- All evidence of construction activities, including ground disturbance due to staging and storage areas shall be removed and remediated upon completion of construction. Any vegetation removed in the course of construction would be replaced ~~-~~on a 1-to-1 in-kind basis. Such replacement planting would be monitored for a period of three years to ensure survival. During this period, all dead plant material shall be replaced.

Protocol: The project owner shall submit a plan for screening construction activities at the site from views from the Hayward Regional Shoreline and staging, material, and equipment storage areas, and restoring the surface conditions of any rights-of-way disturbed during construction of the transmission line and underground pipelines. The plan shall include grading to the original grade and contouring and revegetation of the rights-of-way.

The project owner shall not implement the plan until receiving written approval of the submittal from the California Energy Commission Compliance Project Manager (CPM).

Verification: At least 60 (sixty) days prior to the start of site mobilization, the project owner shall submit the plan to the CPM for review and approval. If the CPM notifies the project owner that any revisions of the plan are needed before the CPM would approve

the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days after installing the screening that the screening is ready for inspection.

The project owner shall notify the CPM within seven days after completing the surface restoration that the areas disturbed during construction are ready for inspection.

VIS-2 Prior to the first turbine roll, the project owner shall prepare and implement an approved ~~perimeter~~ landscape plan to screen the power plant from view to the greatest extent possible. ~~Landscaping shall consist of a mix of trees, shrubs, and groundcovers. Fast growing, evergreen species shall be used to ensure that maximum screening is achieved as quickly as possible and year-round. Street trees shall be 24"-box size at the time of planting. Other trees used for landscaping on the site shall be a minimum of 15 gallons in size~~. Suitable irrigation shall be installed to ensure survival of the plantings. Landscaping shall be installed consistent with the City of Hayward zoning ordinance and ~~Plant species shall be selected consistent~~ with the U.S. Fish and Wildlife Service's recommendations, if applicable, that plants not provide opportunities for perching by birds of prey.

Protocol: The project owner shall submit a ~~perimeter~~ landscape plan to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments. The plan shall include, but not be limited to:

1) A detailed landscape, grading, and irrigation plan, at a reasonable scale, which includes a list of proposed tree and shrub species and installation sizes, and a discussion of the suitability of the plants for the site conditions and mitigation objectives.

2) An installation schedule. The project owner shall not implement the landscape plan until the project owner receives approval of the plan from the CPM. The planting must be completed by the start of commercial operation, and the planting must occur during the optimal planting season.

3) Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and

4) A procedure for monitoring for and replacement of unsuccessful plantings for the life of the project.

The project owner shall not implement the plan until the project owner receives approval of the plan from the CPM.

Verification: Prior to the first turbine roll and at least 60 days prior to installing the landscaping, the project owner shall submit the ~~perimeter~~ landscape plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM would approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscape screening that the planting and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in the Annual Compliance Report.

VIS-3 Prior to first turbine roll, the project owner shall treat all project structures and buildings visible to the public a) in appropriate colors or hues that minimize visual intrusion and contrast by blending with the landscape; b) such that those structures and buildings have surfaces that do not create glare; and c) such that they are consistent with local laws, ordinances, regulations, and standards.

The project owner shall submit for CPM review and approval, a specific treatment plan whose proper implementation would satisfy these requirements.

Protocol: The project owner shall submit the treatment plan to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments. The treatment plan shall include:

1) Specification, and 11" x 17" color simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture;

2) A list of each major project structure, building, tank, transmission line tower and/or pole, and fencing specifying the color(s) and finish proposed for each (colors must be identified by vendor brand or a universal designation);

3) Two sets of brochures and/or color chips for each proposed color;

4) Samples of the proposed treatment and color on any fiberglass materials that would be visible to the public;

5) Documentation that the surfaces to be used on all project elements visible to the public would not create glare;

6) Documentation that non-specular conductors, and nonreflective and nonrefractive insulators would be used on the transmission facilities;

7) A detailed schedule for completion of the treatment; and

8) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated on site until the project owner receives notification of approval of the treatment plan by the CPM.

Verification: At least 60 (sixty) days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed treatment plan to the CPM for review and approval.

If required, the project owner shall provide the CPM with a revised plan within 30 (thirty) days of receiving notification that revisions are needed.

Prior to first turbine roll, the project owner shall notify the CPM that all buildings and structures are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-4 Prior to first turbine roll, the project owner shall design and install all permanent lighting such that a) light bulbs and reflectors are not visible from public viewing areas, b) lighting does not cause reflected glare, and c) illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

1) Lighting is designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

2) Non-glare light fixtures shall be specified;

3) All lighting shall be of minimum necessary brightness consistent with worker safety;

4) High illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have switches or motion detectors to light the area only when occupied;

5) Parking lot lighting shall be provided in accordance with the City of Hayward Security Standards Ordinance; and

6) A lighting complaint resolution form (following the general format of that in Appendix VR-**3**) shall be used by plant operations, to record all lighting complaints received and to document the resolution of those complaints. All records of lighting complaints shall be kept in the onsite compliance file.

The project owner shall notify the CPM when the lighting has been installed. If after inspecting the lighting the CPM notifies the project owner that modifications

to the lighting are needed to minimize impacts, the project owner shall perform the necessary modifications.

Verification: Prior to the first turbine roll, the project owner shall notify the CPM that the lighting is ready for inspection. If the CPM notifies the project owner that modifications to the lighting are needed, within thirty days of receiving that notification the project owner shall implement the modifications.

VIS-5 All fences and walls (including sound walls) for the project shall be non-reflective and treated in appropriate colors or hues that minimize visual intrusion and contrast by blending with the surrounding landscape. Fences and walls for the project shall comply with the applicable requirements in the City of Hayward zoning ordinance that relate to visual resources.

Protocol: Prior to ordering fences and walls the project owner shall submit to the City of Hayward for review and comment, and to the CPM for review and approval, design specifications for fences and walls and documentation of their conformance with the City of Hayward zoning ordinance. The submittal to the CPM shall include the City's comments.

The project owner shall not order fences and walls until the submittal is approved by the CPM.

Verification: At least 30 days prior to ordering fences and walls, the project owner shall submit the specifications and documentation to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM would approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

VIS-6 The project owner shall design project signs using non-reflective materials and unobtrusive colors. The project owner shall ensure that signs comply with the applicable City of Hayward zoning requirements that relate to visual resources. The design of any signs required by safety regulations shall conform to the criteria established by those regulations.

Protocol: The project owner shall submit a signage plan for the project to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

Verification: At least 60 days prior to installing signage, the project owner shall submit the plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM would approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within 7 days after completing installation of the signage that they are ready for inspection.

~~**VIS-7** Prior to the start of commercial operation, the project owner shall treat the major structures of the Advanced Water Treatment (AWT) facility and the buildings housing the project's administrative offices and control room, warehouse, and water treatment laboratory with appropriate architectural treatment if visible from Enterprise Avenue and Whitesell Street. All architectural treatment for the project shall be consistent with the City of Hayward's architectural design guidelines for industrial zoning districts. A specific architectural treatment plan shall be developed for CPM approval to ensure that the treatments do not unduly contrast with the surrounding landscape.~~

~~Protocol: The project owner shall submit an architectural treatment plan to the City of Hayward for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments. The architectural screening plan shall include:~~

~~1) Specification, and 11" x 17" color simulations at life-size scale as seen from Whitesell Street and Enterprise Avenue of the treatment proposed for use on the AWT structures and project buildings;~~

~~2) A detailed schedule for completion of the treatment; and,~~

~~3) A procedure to ensure proper treatment maintenance for the life of the project.~~

~~The project owner shall not implement the plan until approved by the CPM.~~

~~**Verification:** At least 60 days prior to start of construction, the project owner shall submit the architectural treatment plan to the CPM for review and approval.~~

~~If the CPM notifies the project owner of any revisions that are needed before the CPM would approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan.~~

~~Not less than thirty (30) days prior to the start of commercial operation, the project owner shall notify the CPM that the architectural screening is ready for inspection.~~

~~The project owner shall provide a status report regarding screening maintenance in the Annual Compliance Report.~~

VIS-8 The project owner shall reduce the RCEC cooling tower and HRSG visible vapor plumes by the following methods:

- The project owner shall reduce the RCEC cooling tower visible plumes through the use of a plume abated wet/dry cooling tower that has a stipulated plume abatement design point of 38°F and 80 percent relative humidity. An automated control system would be used to ensure that plumes are abated to the maximum extent possible for the stipulated design point.
- ~~The project owner shall reduce the RCEC HRSG exhaust visible plumes through the use of an economizer bypass that is capable of raising the exhaust temperature to a minimum of 270°F. An automated control system would be used to ensure that plumes are abated to the maximum extent possible when raising the exhaust temperature to the stipulated design point.~~

Verification: At least 30 days prior to first turbine roll, the project owner shall provide to the CPM for review and approval the specifications for the automated control systems and related systems and sensors that would be used to ensure maximum plume abatement for the wet/dry cooling tower ~~and HRSG economizer bypass~~ plume abatement systems.

VIS-9 Prior to commercial operation, the project owner shall install new trailside amenities in the Hayward Regional Shoreline ~~to offset the blockage of the view of Mt. Diablo from the observation deck of the Hayward Shoreline Interpretive Center. Consistent with Measure 1 of project owner's Visual Mitigation Plan, the trail amenities shall~~ that may include, ~~but not necessarily be limited to,~~ benches, free-of-charge viewscopes, and an information kiosk and set of low panels for the display of interpretive information related to Mt. Diablo and other important elements of the regional setting. The project owner shall work with the Hayward Area Recreation and Parks District (HARD) to develop the final designs for these facilities. As part of this measure, the project owner shall provide the HARD with an adequate budget that would allow its Staff to research and prepare the interpretive materials to be mounted on the kiosk and panels. The project owner shall determine the precise location of the trailside amenities in consultation with the CPM and the HARD.

Verification: Within 12 months after ~~of~~ the start of HRSG construction, the project owner shall submit a final design plan for the trailside amenities to the HARD for review and comment and to the CPM for review and approval. If the CPM notifies the project owner that revisions are needed before the CPM would approve the plan, within 30 days of receiving that notification the project owner shall submit a revised plan to the CPM.

Not less than thirty 30 days prior to the first turbine roll, the project owner shall notify the CPM that the trailside amenities are ready for inspection.

VIS-10 Prior to the start of construction, the project owner shall prepare and implement an approved off-site landscaping plan. ~~The project owner shall install trees at the Whitesell Business Park (KOP 1) to screen views of the project from this viewing area to the maximum extent possible. Consistent with Measure 2 of project owner's Visual Mitigation Plan trees shall be planted in the existing empty planting islands at the Whitesell Business Park. If the landowner agrees, the project owner also shall plant trees in the landscape area near the Whitesell~~

~~Business Park buildings and outdoor patio area to increase the effectiveness of the landscape screening.~~ Consistent with Measure 3 of the Visual Mitigation Plan, the project owner shall install trees along the west side of the warehouse and industrial park complexes and the project site that line the eastern edge of the shoreline wetlands. The extent of the landscaping area, as shown in Visual Resources Figure 14 shall be expanded to include the berm from Breakwater Avenue north to Johnson Road. Trees shall be planted close together to create a dense screen. Trees planted along the edge of the Whitesell Business Park parking lot shall be pruned up as they grow to allow westward views from the parking lot to the shoreline open space. Trees planted close to the walls of the warehouses shall be allowed to take on a bush-like form to maximize their screening potential.

All tree species shall be fast growing and evergreen and shall be 24" box size when planted. The project owner shall provide an appropriate level of irrigation and fertilization to ensure optimal tree growth, health, and appearance.

Protocol: Prior to start of construction, the project owner shall submit an offsite landscape plan to the City of Hayward and the U.S. Fish and Wildlife Service, if applicable, for review and comment, and to the CPM for review and approval. The submittal to the CPM shall include the City's comments. The plan shall include, but not be limited to:

1) A detailed landscape, grading, and irrigation plan, at a reasonable scale, which includes a list of proposed tree and shrub species and installation sizes, and a discussion of the suitability of the plants for the site conditions and mitigation objectives.

2) An installation schedule. The project owner shall not implement the landscape plan until the project owner receives approval of the plan from the CPM. The planting must be completed by the start of commercial operation, and the planting must occur during the optimal planting season.

3) Maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project; and

4) A procedure for monitoring for and replacement of unsuccessful plantings for the life of the project. The project owner shall not implement the plan until the project owner receives approval of the plan from the CPM.

Verification: At least 90 days prior to start of construction, the project owner shall submit the ~~perimeter~~ offsite landscape plan to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM would approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the landscape screening that the planting and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in the Annual Compliance Report.

VIS-11 The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

1) All lighting shall be of minimum necessary brightness consistent with worker safety.
2) All fixed position lighting shall be shielded, hooded, and directed downward to minimize backscatter to the night sky and direct light trespass (direct lighting extending outside the boundaries of the construction area).
3) Wherever feasible and safe, lighting shall be kept off when not in use and motion detectors shall be employed.
4) A lighting complaint resolution form (following the general format of that in Appendix VR-3, ~~found on page 4.11-54~~ of the Final Staff Assessment shall be maintained by plant construction management, to record all lighting complaints received and to document the resolution of that complaint.

Verification: At least 30 (thirty) days prior to the start of ground disturbance, the project owner shall provide to the CPM documentation demonstrating that the lighting would comply with the condition.

If the CPM notifies the project owner that modifications to the lighting are needed, within 30 (thirty) days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM that the modifications have been completed.

The project owner shall report any lighting complaints and documentation of resolution in the Monthly Compliance Report, accompanied by any lighting complaint resolution forms for that month.

REFERENCES

Armas. 2001. Letter from Jesus Armas, City Manager, regarding clarification of City's preference for architectural screening of the power plant. Submitted to Kae Lewis December 3, 2001.

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. July 2002.

COH 1986a - City of Hayward, Zoning Ordinance. 1986.

COH 2002a - City of Hayward, General Plan, adopted March 12, 2002.

COH 2005 – City of Hayward, Agenda Report to Hayward City Council. Authorization to City Manager to execute a cooperation and option Agreement with Russell City Energy Center, LLC in connection with the Russell City Energy Center. October 11, 2005.

COH 2007e – City of Hayward/D. Rizk (tn 40102) City of Hayward Letter on Land Use Issues/Russell City Energy Center and Eastshore Energy Center. 04/19/2007 Rec'd 04/23/2007

COH 2007f – City of Hayward/D. Rizk. Letter to Eric Knight, Senior Planner, regarding conditions for the amended Russell City Energy Center. 05/25/2007. Rec'd 05/26/2007.

Haag. 2002. Letter from Nancy Haag, Assistant Vice President, Archon Group (part owners of Whitesell Business Park) to Alex Ameri, City of Hayward, regarding landscaping enhancements at the Whitesell Business Park. Letter dated May 9, 2002.

Hanna. 2002. Letter from Mr. Hanna, Project Manager, Bay Center Distribution Center accepting Calpine's offer to plant trees on their property.

HRSIC 2007 - Hayward Regional Shoreline Interpretive Center. 2007

Mead. 2002. Letter from Meredith Mead, Assistant Property Manager, Whitesell Business Center accepting Calpine's offer to plant trees on their property. Letter dated April 15, 2002.

RC 2006a – Russell City/M. Hartfield (tn: 38410). Petition for Amendment No. 1, Russell City Energy Center. 11/17/2006. Rec'd 11/17/2006.

APPENDIX VR-1

STAFF'S VISUAL RESOURCES EVALUATION METHODOLOGY

Visual resources analysis has an inherent subjective aspect. Use of generally accepted criteria for determining environmental impact significance and a clearly described analytical approach aid in developing an analysis that can be readily understood.

Staff's methodology is based on the California Environmental Quality Act (CEQA) Guidelines. The methodology includes an evaluation of the visual characteristics of the existing setting, the visual characteristics of the proposed project, the circumstances affecting the viewer, and the degree of visual impact that the proposed project would cause.

ELEMENTS OF THE METHODOLOGY

Key Observation Points

Staff evaluates the existing visible physical environmental setting from a fixed vantage point (called a "Key Observation Point" [KOP]), and the visual change introduced by the proposed project to the view from that KOP. The view as seen from the KOP is referred to as the viewshed. Staff uses a KOP[2] to represent a location(s) from which to conduct detailed analyses of the proposed project and to obtain existing condition photographs and prepare visual simulations. KOPs are selected to be representative of the most critical viewshed locations from which the project would be seen. Because it is not feasible to analyze all the views in which a proposed project would be seen, it is necessary to select a KOP that would most clearly display the visual effects of the proposed project. A KOP may also represent a primary viewer groups that would potentially be affected by the project. In addition to KOP photo(s), staff reviews landscape character photos that help provide a visual overview of a project site, its vicinity, and the selected KOP area, as appropriate. Prior to application submittal, staff participates in the selection of appropriate KOP(s) for the analysis.

Staff also reviews federal, state, and local LORS and their policies or guidelines for the protection or preservation of visual resources that may be applicable to the project site and surrounding area; such as local government land-use planning documents (e.g., General Plan, zoning ordinance).

LORS Consistency

Energy Commission staff consider federal, state, and local laws, ordinances, regulations, and standards (LORS) relevant to visual resources. Conflicts with such LORS can constitute significant visual impacts. For example visual staff examines land use planning documents, such as local government General Plans and Specific Plans, and zoning ordinances applicable to the project site and surrounding area to gain insight as to the type of land uses intended for the area, and the guidelines given for the protection or preservation of visual resources.

[2]The use of KOPs or similar view locations is common in visual resource analysis. The U.S. Bureau of Land Management (USDI BLM 1986a, 1986b, 1984) and the U.S. Forest Service (USDA Forest Service 1995) use such an approach.

Visible Water Vapor Plume Frequency

When a proposed power plant is operated at times of low temperature and high humidity, the potential exists for the exhaust from its cooling towers to condense and form visible water vapor plumes (steam plume). The formed plume potentially could have an adverse effect on visual resources in the vicinity of the project.

The severity of the visual impacts created by a project's visible plumes depends on five factors: 1) the frequency of the plumes, 2) the physical size of the plumes (dimensions), 3) the sensitivity of the viewers who would see the plumes, 4) the distance between the plumes and the viewers, 5) the visual quality of the existing viewshed; and, 6) whether a scenic resource or vista would be blocked by the plumes.

Staff completes water vapor plume modeling of the proposed project's cooling towers using design parameters provided by the applicant. Staff models the estimated plume frequency and dimensions for the cooling tower and turbine exhaust using the Combustion Stack Visible Plume (CSVP) model, and a multi-year meteorological data set obtained for the area where the project is proposed.

Staff considers the 20th percentile plume to be the reasonable worst case plume dimensions on which to base its visual impact analysis. The 20th percentile plume is the smallest of the plumes that are predicted to occur zero to 20 percent of the time. Eighty (80) percent of the time the dimensions of the clear hour plumes would be smaller than the 20th percentile plume dimensions. A one percentile clear hour plume would be extremely large, very noticeable to a wide area, but would occur very infrequently.

Staff focuses its frequency of the plumes analysis on the portion of the year when the ambient conditions (i.e., cool/cold temperatures and high relative humidity) are such that plumes are most likely to occur (typically from November through April) and when "clear" sky conditions exist because this is when the plumes would cause the most visual contrast with the sky and have the greatest potential to cause adverse visual impacts. Staff eliminates from consideration plumes that occur at night or during rain or fog conditions because plume visibility, and overall visual quality, is typically low during those conditions. In addition, plumes that occur during specific cloudy conditions are also eliminated because under these conditions, plumes have less contrast with the background sky. A plume frequency of 20 percent of seasonal daylight no rain/fog high visual contrast (i.e. "clear") hours is used to determine potential plume impact significance. If it is determined that the seasonal daylight clear hour plume frequency is greater than 20 percent, then plume dimensions are determined and a significance analysis is included in the Visual Resources section of the Staff Assessment for the proposed project.

Plume frequencies of less than 20 percent have been determined to generally have a less than significant impact. If the modeling predicts seasonal daylight clear plume frequencies greater than 20 percent, staff calculates the dimensions of the clear hour plumes and then conduct an assessment of the visual change (in terms of contrast, dominance and view blockage) that would be caused by the 20th percentile plume dimensions. Staff also analyzes the predicted plume's potential luminescence (light refraction resulting in a glare or glow) and color contrast, and opacity (the degree to

which light is prevented from passing through an emission plume) that may be introduced to the KOP viewsheds. Considering the visual sensitivity of the existing landscape and viewing characteristics, the degree of visual change caused by the plumes may result in a significant visual impact.

Energy Commission staff model the estimated turbine plume frequency and dimensions for the cooling tower and turbine exhaust using the Combustion Stack Visible Plume (CSVP) model, and a multi-year meteorological data set obtained for the area where the project is proposed.

A plume frequency threshold of 20 percent of seasonal (typically from November through April) daylight no rain/fog high visual contrast (i.e. “clear”) hours is used to assess potential plume impact significance. If it is determined that the seasonal daylight clear hour plume frequency is greater than 20 percent, then plume dimensions are determined and a significance analysis is included in the Visual Resources section of the Staff Assessment for the proposed project. Plume frequencies of less than 20 percent have been determined to generally have a less than significant impact.

California Environmental Quality Act Guidelines

The CEQA Guidelines define a “significant effect on the environment” to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance” (California Code of Regulations, Title 14, Section 15382).

Appendix G Environmental Checklist Form of the CEQA Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Staff answers each of the four checklist questions for the proposed project, including any related facility such as a transmission line or gas pipeline; and for both construction and operation phases.

APPENDIX VR-2

VISIBLE PLUME MODELING ANALYSIS

William Walters

INTRODUCTION

The following provides the assessment of the Russell City Energy Center (RCEC) project gas turbine heat recovery steam generator (HRSG) exhaust stack visible plumes. Staff completed a modeling analysis for the project owner's proposed amendment for an unabated gas turbine/HRSG design.

PROJECT DESCRIPTION

The RCEC project owner has submitted an amendment to the existing license that seeks to modify the design for the two 7F frame gas turbine/HRSGs and eliminate the steam injection power augmentation. Additionally, the project amendment requests a revision to condition of certification **VIS-8** in the RCEC Decision) to remove the requirement for an economizer bypass system to reduce the plume frequency of the gas turbine/HRSG plumes.

The project amendment does not request revision to condition of certification **VIS-8** in relation to the plume abated cooling tower. Therefore, the existing analysis of the plume abated cooling tower remains valid.

VISIBLE PLUME MODELING METHODS

PLUME FREQUENCY MODELING

The CSVP model was used to estimate plume frequency for the HRSG exhausts. This model provides conservative estimates of plume frequency based on both hourly exhaust parameters and ambient condition data to determine the plume frequency.

CLOUD COVER DATA ANALYSIS METHOD

A plume frequency of 20 percent of seasonal (November through April) daylight no rain/fog high visual contrast (i.e. "clear") hours is used as a plume impact study threshold trigger and to determine potential plume impact significance. The high visual contrast hour determination methodology is provided below:

> The Energy Commission staff has identified a "clear" sky category during which plumes have the greatest potential to cause adverse visual impacts. For this project the meteorological data set[3] used in the analysis categorizes total sky cover

[3] This analysis uses a six year (1990 through 1995) San Francisco International Airport (SFO) Hourly US Weather Observations (HUSWO) meteorological data set obtained from the National Climatic Data Center (NCDC). This meteorological station is located near the site, approximately 13 miles west, and

and opaque sky cover in 10% increments. Staff has included in the "Clear" category a) all hours with total sky cover equal to or less than 10% plus b) half of the hours with total sky cover 20-100% that have sky opacity equal to or less than 50%. The rationale for including these two components in this category is as follows: a) plumes typically contrast most with sky under clear conditions and, when total sky cover is equal to or less than 10%, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and b) for a substantial portion of the time when total sky cover is 20-100% and the opacity of sky cover is relatively low (equal to or less than 50%), clouds do not substantially reduce contrast with plumes; staff has estimated that approximately half of the hours meeting the latter sky cover and sky opacity criteria can be considered high visual contrast hours and are included in the "clear" sky definition.

If it is determined that the seasonal daylight clear hour plume frequency is greater than 20 percent then plume dimensions are determined, and a significance analysis of the plumes is completed.

HRSG VISIBLE PLUME MODELING ANALYSIS

HRSG PARAMETERS

Based on the stack exhaust parameters anticipated by the project owner (RCEC 2006), the frequency of visual plumes can be estimated. The operating data for these stacks are provided in Visible Plume Table 1.

Visible Plume Table 1 – Amended HRSG Exhaust Parameters [a]

Parameter	**HRSG Exhaust Parameters**				
Stack Height	145 feet (44.2 meters)				
Stack Diameter	18.0 feet (5.49 meters)				
Ambient Conditions	Molecular Weight	Mole (%)	Moisture Content (% by weight)	Exhaust Flow Rate (klb/hr)	Exhaust Temp (°F)
Full Load No Duct Firing					
38 °F	28.43	8.05	5.09	4,038.9	193
59 °F	28.38	8.53	5.41	3,920.4	194
88 °F	28.28	9.41	5.99	3,768.8	199
Full Load Peak Duct Firing					
38 °F	28.39	8.74	5.54	4,047.6	180
59 °F	28.33	9.24	5.87	3,929.1	183
88 °F	28.23	10.14	6.47	3,777.5	188

Source: Amendment Request No. 1 (RCEC 2006, Appendix 3.1A Table 3.1A-4)
Note(s): a. Values were extrapolated or interpolated between hourly ambient condition data points as necessary.

The turbine type and duct burner size are not requested to be changed. The major requested changes to the design and/or exhaust conditions are:

1. Elimination of the economizer bypass system.

being located adjacent to the bay would provide representative temperature and relative humidity conditions.

2. Unabated exhaust temperatures increased from the previously noted 170°F[4] value to values ranging from 180°F to 199°F.
3. Elimination of the steam injection power augmentation.

The last two of these revisions significantly reduce the unabated plume potential from the RCEC HRSG exhausts.

HRSG VISIBLE PLUME MODELING RESULTS

Visible Plume Table 2 provides the CSVP model visible plume frequency results for duct firing and non-duct firing operations using a six-year (1990-1995) meteorological data set, obtained from the National Climatic Data Center, from SFO.

Visible Plume Table 2 – Staff Predicted Hours with HRSG Steam Plumes SFO 1990-1995 Meteorological Data

Case	Available (hr)	Full Load No Duct Firing		Full Load Peak Duct Firing	
		Plume (hr)	Percent	Plume (hr)	Percent
All Hours	52,583	1,006	1.91%	4,391	8.35%
Daylight Hours	26,843	168	0.63%	774	2.88%
Daylight No Rain No Fog	24,694	72	0.29%	365	1.48%
Seasonal Daylight No Rain No Fog*	10,354	72	0.70%	352	3.40%
Seasonal Daylight Clear**	4,946	48	0.97%	174	3.52%

*Seasonal conditions occur anytime from November through April.
**Available hours based on seasonal daylight clear hours.

A visible plume frequency of 20% of seasonal (November through April) daylight clear hours is used as a plume impact study threshold trigger. The visible plume frequencies are predicted to be well less than 20% of seasonal daylight clear hours at full load no duct firing and full load peak duct firing conditions.

The original design with the economizer bypass system was capable of abating essentially all plumes under no duct firing operation, but plume formation was still possible under worst case conditions due to the amount of steam that was injected for power augmentation. A comparison of the original design and requested amended design is provided in Visible Plume Table 3.

Visible Plume Table 3 – Staff Predicted HRSG Steam Plumes Frequencies Original Design vs. Requested Amended Design

Case	Original Design Plume Frequencies			Amended Design Plume Frequencies	
	No Duct Firing	With Steam Injection	Worst Case[a]	No Duct Firing	Duct Firing
All Hours	0.002%	5.7%	8.8%	1.91%	8.35%
Daylight No Rain No Fog	0%	0.93%	1.6%	0.29%	1.48%
Seasonal Daylight No Rain No Fog	0%	2.2%	3.5%	0.70%	3.40%

Note(s): a. Represents full duct firing and steam injection.

Visible Plume Table 3 shows that the original design with the economizer bypass would have had similar plume frequency potential to the amended design without economizer bypass, although the no duct firing case has a very small increased plume potential,

[4] Without the use of the economizer bypass.

and that both the original and revised designs are forecast to be well below the 20% of seasonal daylight clear hours impact study threshold trigger

CONCLUSIONS

Visible water vapor plumes from the proposed amended RCEC gas turbine/HRSG exhausts are expected to occur infrequently, well below 20 percent of seasonal daylight clear hours. Therefore, no further visual impact analysis of the expected plume sizes has been completed.

The project owner's request to delete the **VIS-8** requirements for an economizer bypass would not create a significant visual impact and the revised version of **VIS-8** shown in the Amendment No. 1 documentation is acceptable.

REFERENCES

RCEC (Russell City Energy Company, LLC.). 2006. Russell City Energy Center, Hayward, CA, Amendment No. 1. Submitted to the California Energy Commission, November 2006.

APPENDIX VR-3

LIGHTING COMPLAINT RESOLUTION FORM

Russell City Energy Center City of Hayward, Alameda County, California
Complainant's name and address: Phone number:
Date complaint received: Time complaint received:
Nature of lighting complaint:
Definition of problem after investigation by plant personnel: Date complainant first contacted:
Description of corrective measures taken: Complainant's signature: _____ Date:
Approximate installed cost of corrective measures: $ Date installation completed: Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct: Plant Manager's Signature:

(Attach additional pages and supporting documentation, as required.)

VISUAL RESOURCES - FIGURE 1

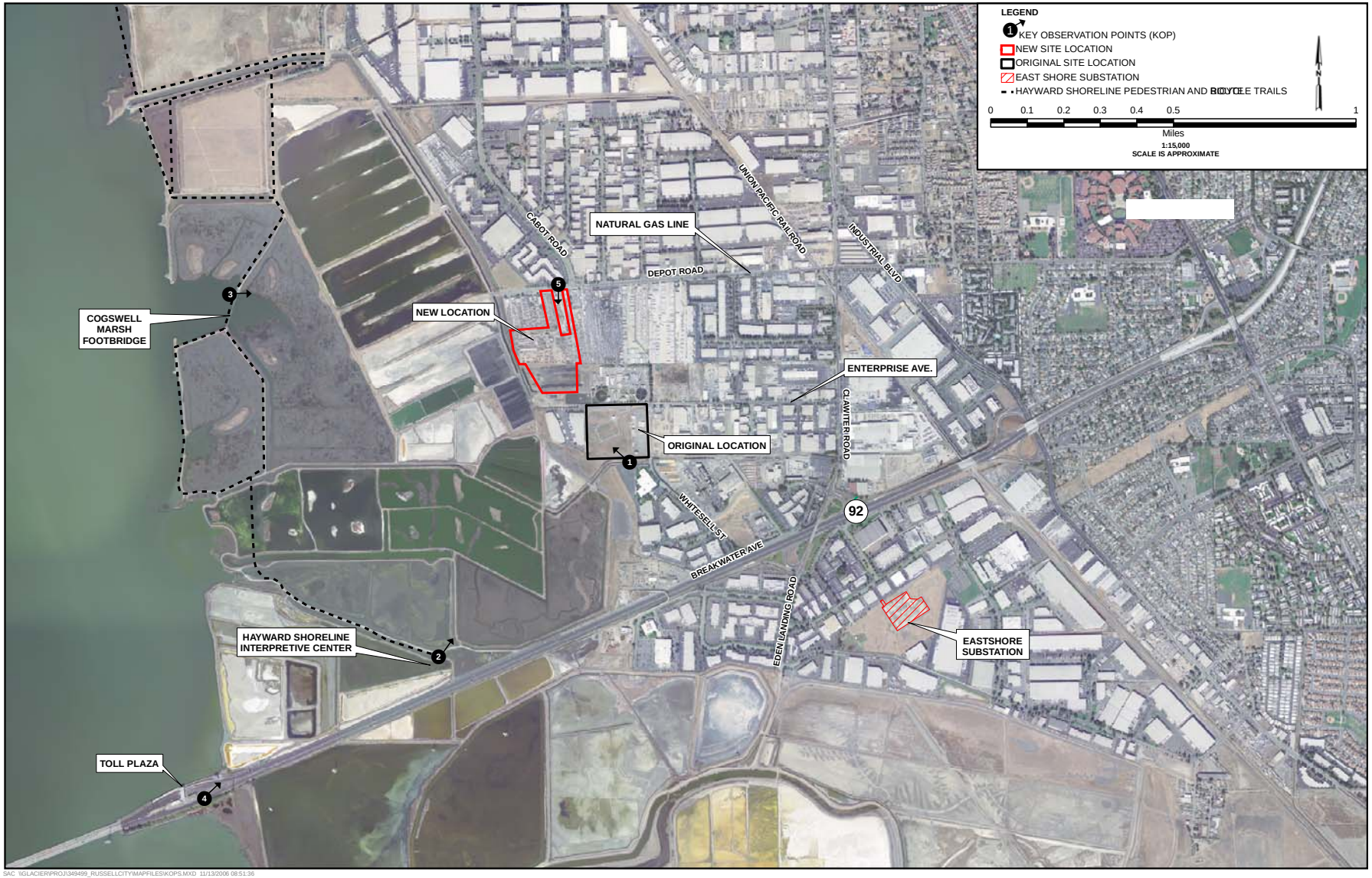
Russell City Energy Center Project - Aerial of Project Site and Vicinity

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Google Earth

VISUAL RESOURCES - FIGURE 2

Russell City Energy Center Project - Location of Project Features and Key Observation Points



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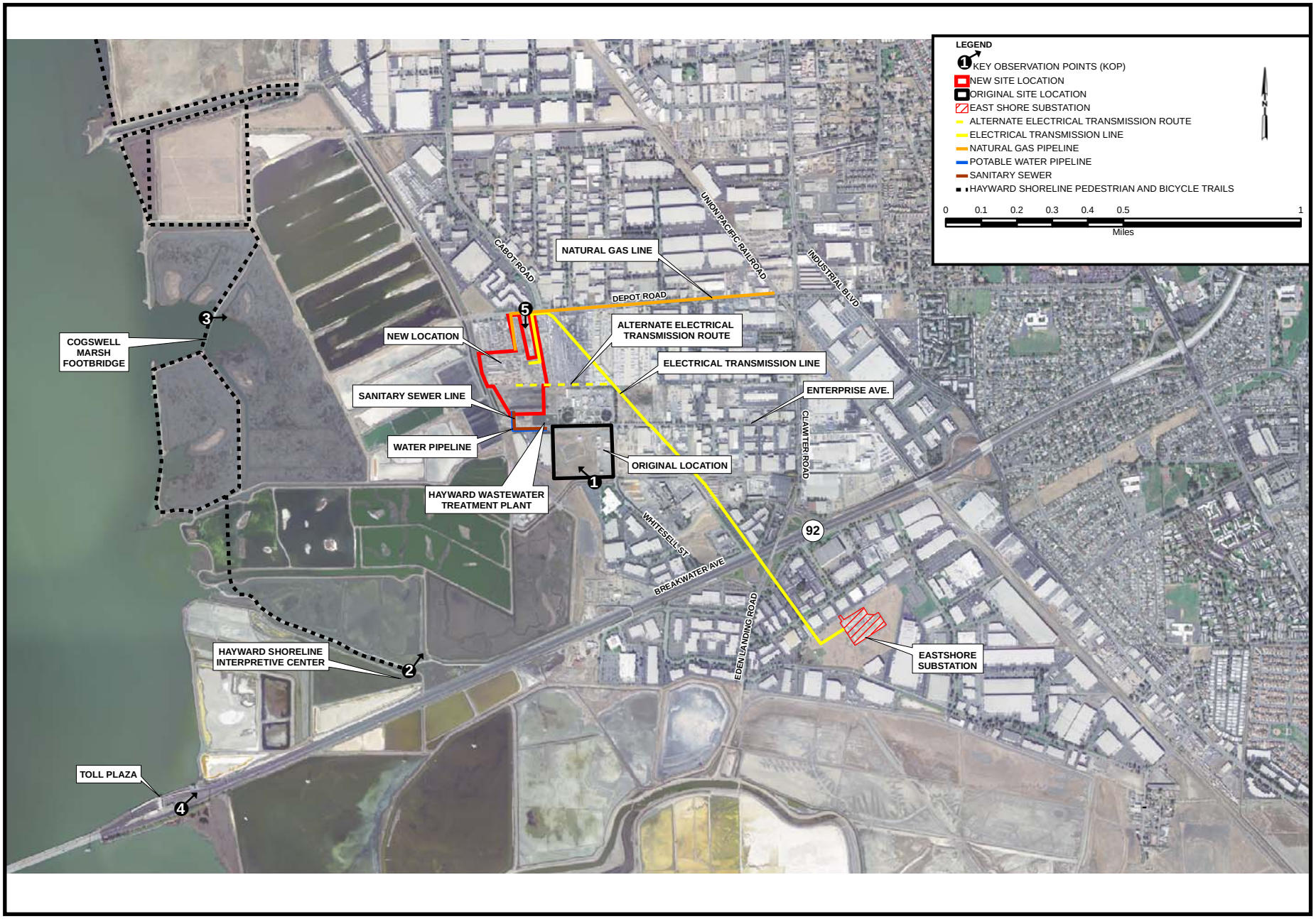
CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-1

VISUAL RESOURCES - FIGURE 2

Russell City Energy Center Project - Location of Key Observation Points

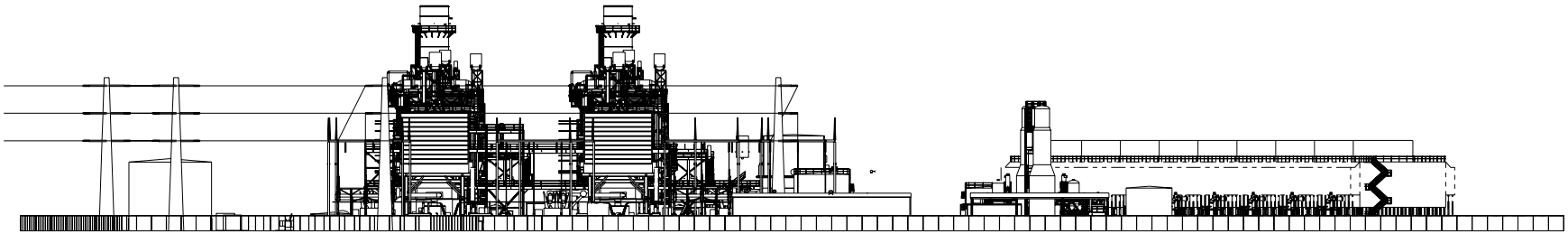


CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

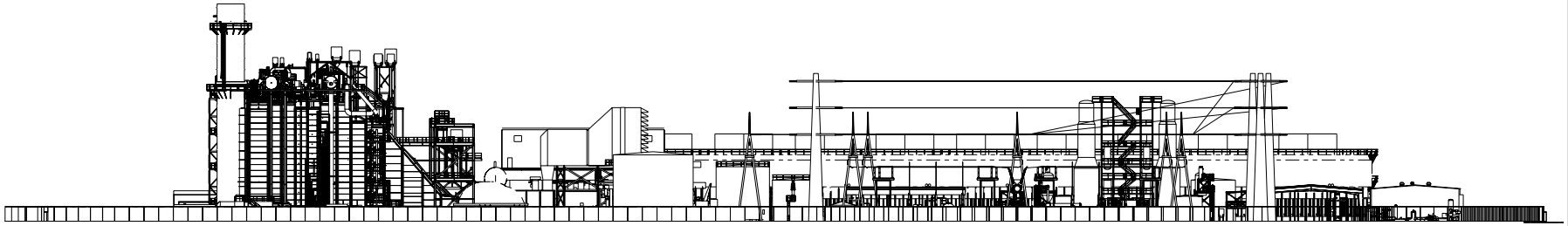
SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-1

VISUAL RESOURCES - FIGURE 3

Russell City Energy Center Project - Plant Elevation Looking North and East



NORTH ELEVATION
LOOKING SOUTH



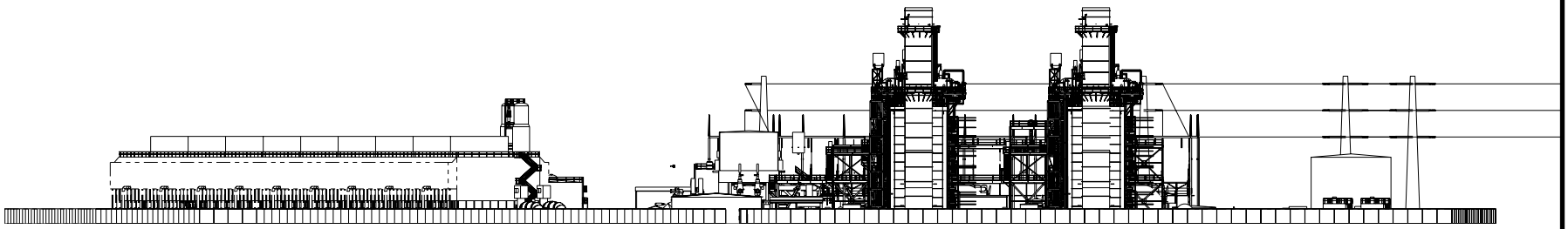
EAST ELEVATION
LOOKING WEST

40 0 40 80 120

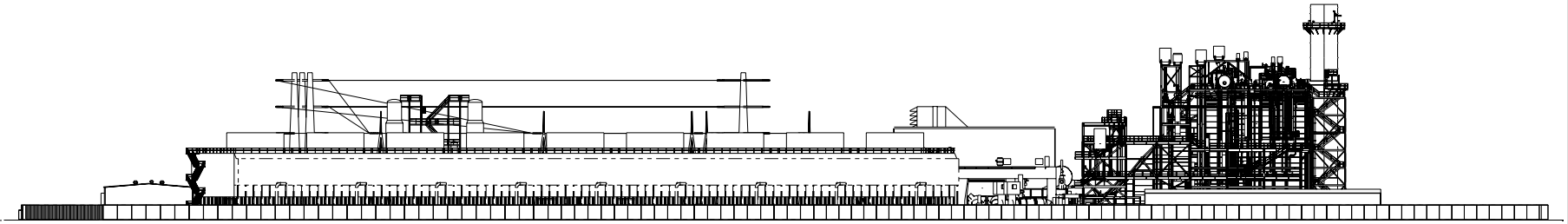
SOURCE: Russell City Energy Center Amendment No.1 - Figure 2.1-3

VISUAL RESOURCES - FIGURE 4

Russell City Energy Center Project - Plant Elevation Looking West and South



SOUTH ELEVATION
LOOKING NORTH



WEST ELEVATION
LOOKING EAST

40 0 40 80 120

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center Amendment No.1 - Figure 2.1-4

VISUAL RESOURCES - FIGURE 5a & b

Russell City Center Project - Landscape Character Photo of Hayward Regional Shoreline

Figure 5a - Looking Northeast from Hayward Interpetive Center

Figure 5b - Looking Northwest from Hayward Interpetive Center

CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Staff photo

VISUAL RESOURCES - FIGURE 6

Russell City Energy Center Project - Landscape Character Photo of Hayward Regional Shoreline
Looking East Towards Project Site from Trail

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Staff Photo

VISUAL RESOURCES - FIGURE 7

Russell City Energy Center Project - KOP 1 - Existing View from an Employee Parking Area in a Light Industrial Park Looking North

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-2, A

VISUAL RESOURCES - FIGURE 8

Russell City Energy Center Project - KOP 1 - Existing View with the Photo Simulated Amended Project

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-2, B

VISUAL RESOURCES - FIGURE 9

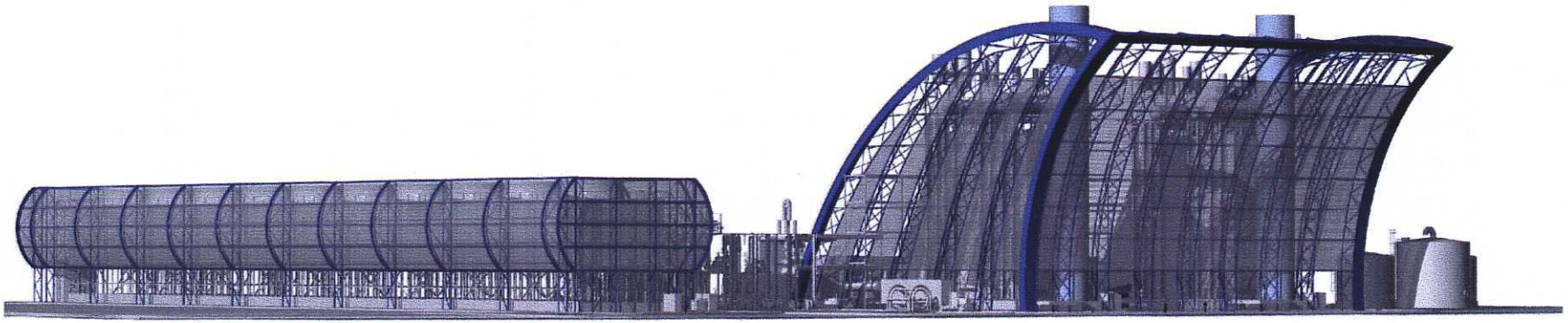
Russell City Energy Center Project - Photo Simulation of Original Project from KOP 1

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center AFC, Vol.1

VISUAL RESOURCES - FIGURE 10

Russell City Energy Center Project - Original Project's Proposed Visual Facade - " The Wave"



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: AFC Figure 8.13-13

VISUAL RESOURCES - FIGURE 11

Russell City Energy Center Project - KOP 2 - Existing View from Hayward Shoreline Interpretive Center

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center 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

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-3, B

VISUAL RESOURCES - FIGURE 13

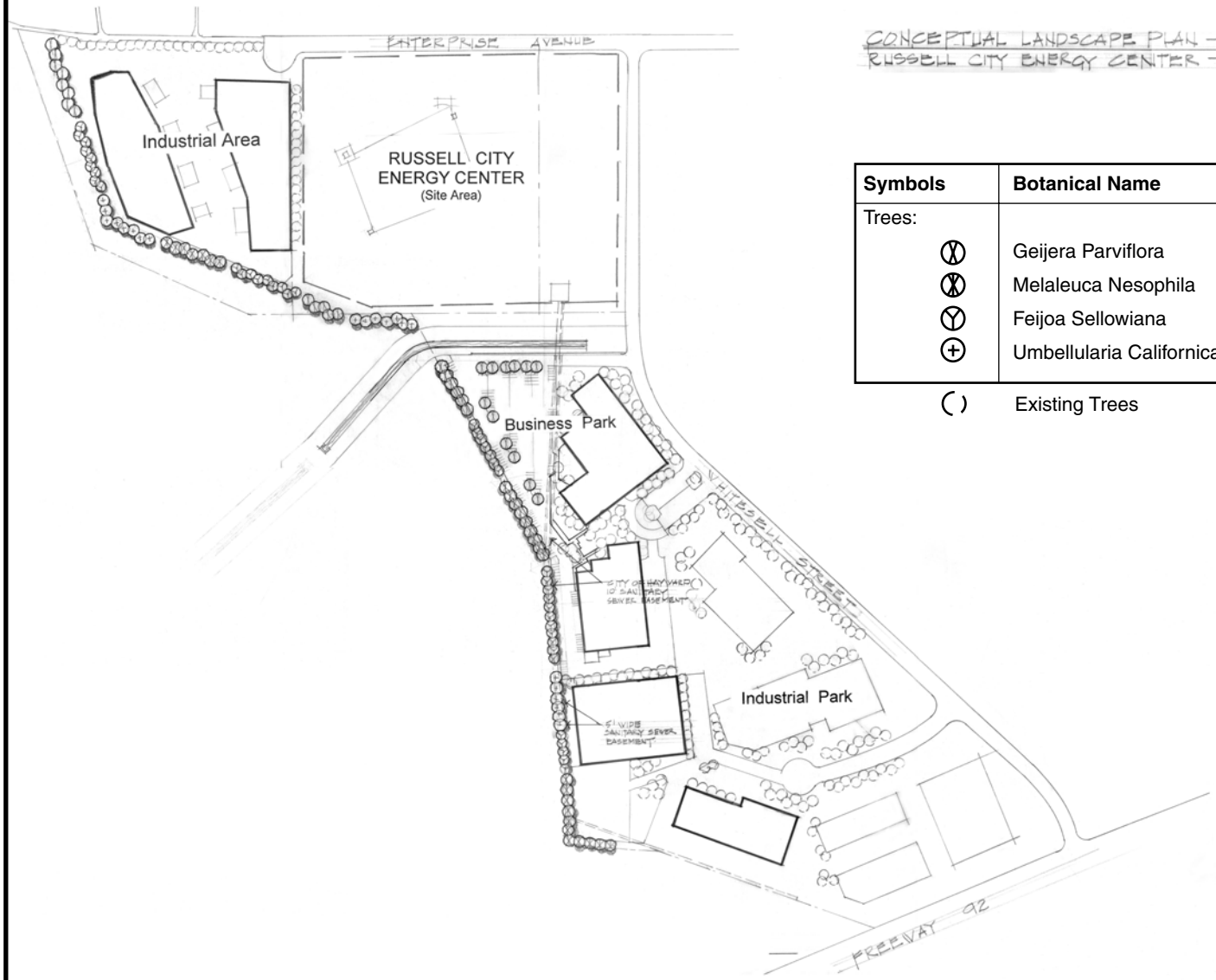
Russell City Energy Center Project - Photo Simulation of Original Project from KOP 2

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center AFC, Vol.1

VISUAL RESOURCES - FIGURE 14

Russell City Energy Center Project - Original Project's Conceptual Offsite Landscaping Plan



CONCEPTUAL LANDSCAPE PLAN – SCREENING OF INDUSTRIAL AREA
RUSSELL CITY ENERGY CENTER – HAYWARD, CA

Symbols	Botanical Name	Common Name
Trees:		
⊗	Geijera Parviflora	Australian Willow
⊗	Melaleuca Nesophila	Pink Melaleuca
Ⓨ	Feijoa Sellowiana	Pineapple Guava
⊕	Umbellularia Californica	California Bay

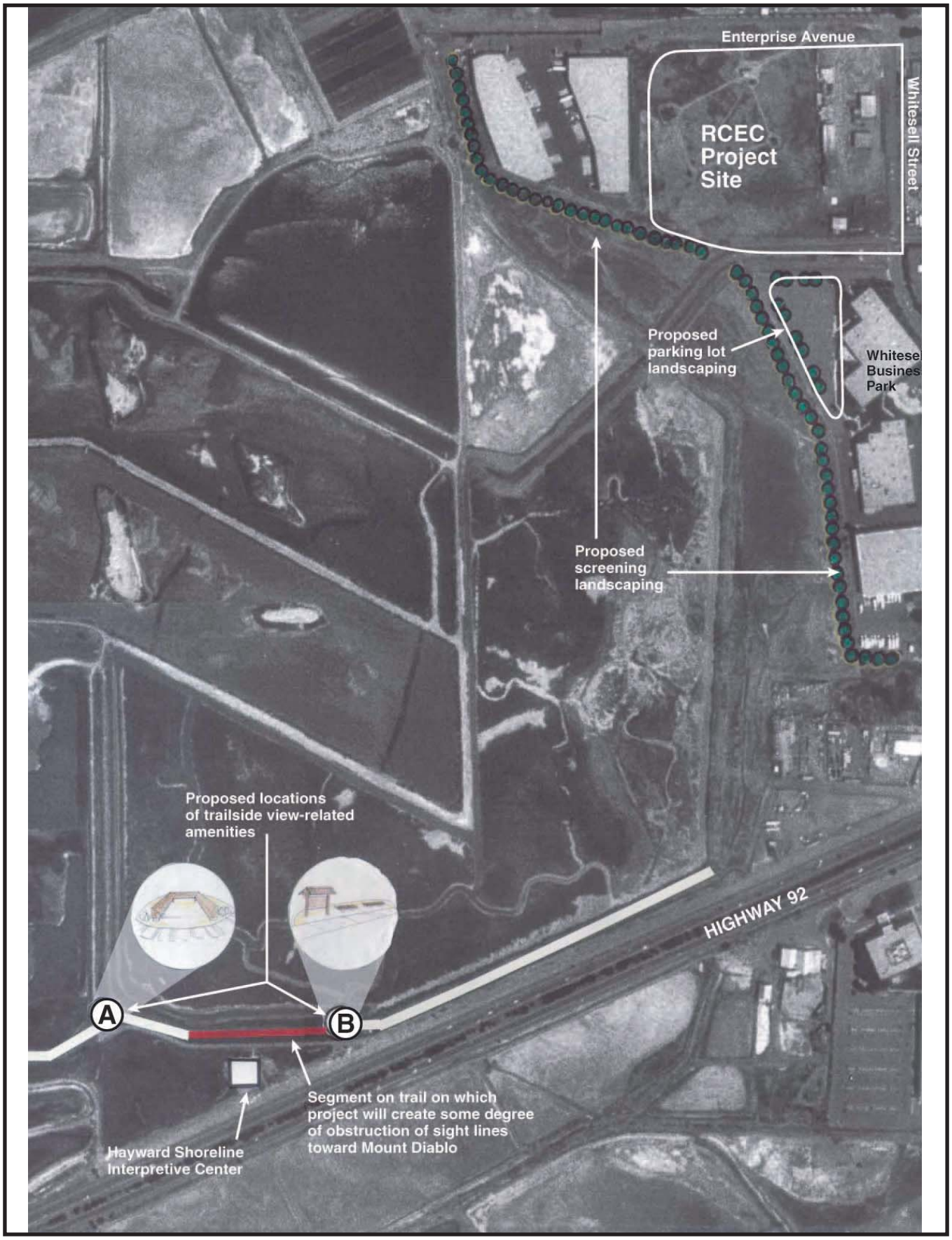
( ) Existing Trees

Figure 4
Russell City Energy Center, Hayward, CA

SOURCE: Calpine/Bechtel

VISUAL RESOURCES - FIGURE 15

Russell City Energy Project - Locations of Offsite Landscaping and Shoreline Trail Amenities



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Calpine/Bechtel

VISUAL RESOURCES - FIGURE 16

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

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-4, A

VISUAL RESOURCES - FIGURE 17

Russell City Energy Center Project - Existing View from Cogswell Marsh Footbridge with Photo Simulated Amended Project

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-4, B

VISUAL RESOURCES - FIGURE 18

Russell City Energy Center Project - Photo Simulation of Original Project from KOP 3

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center AFC, Vol.1

VISUAL RESOURCES - FIGURE 19

Russell City Energy Center Project - KOP 4 - Existing View from San Mateo Bridge Toll Plaza on State Route 92 Looking East

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-5, A

VISUAL RESOURCES - FIGURE 20

Russell City Energy Center Project - Existing View from San Mateo Bridge Toll Plaza with the Photo Simulated Amended Project

SOURCE: Russell City Energy Center Amendment No.1 - Figure 3.12-5, B

VISUAL RESOURCES - FIGURE 21

Russell City Energy Center Project - Photo Simulation of Original Project from KOP 4

SOURCE: Russell City Energy Center AFC, Vol.1

VISUAL RESOURCES - FIGURE 22

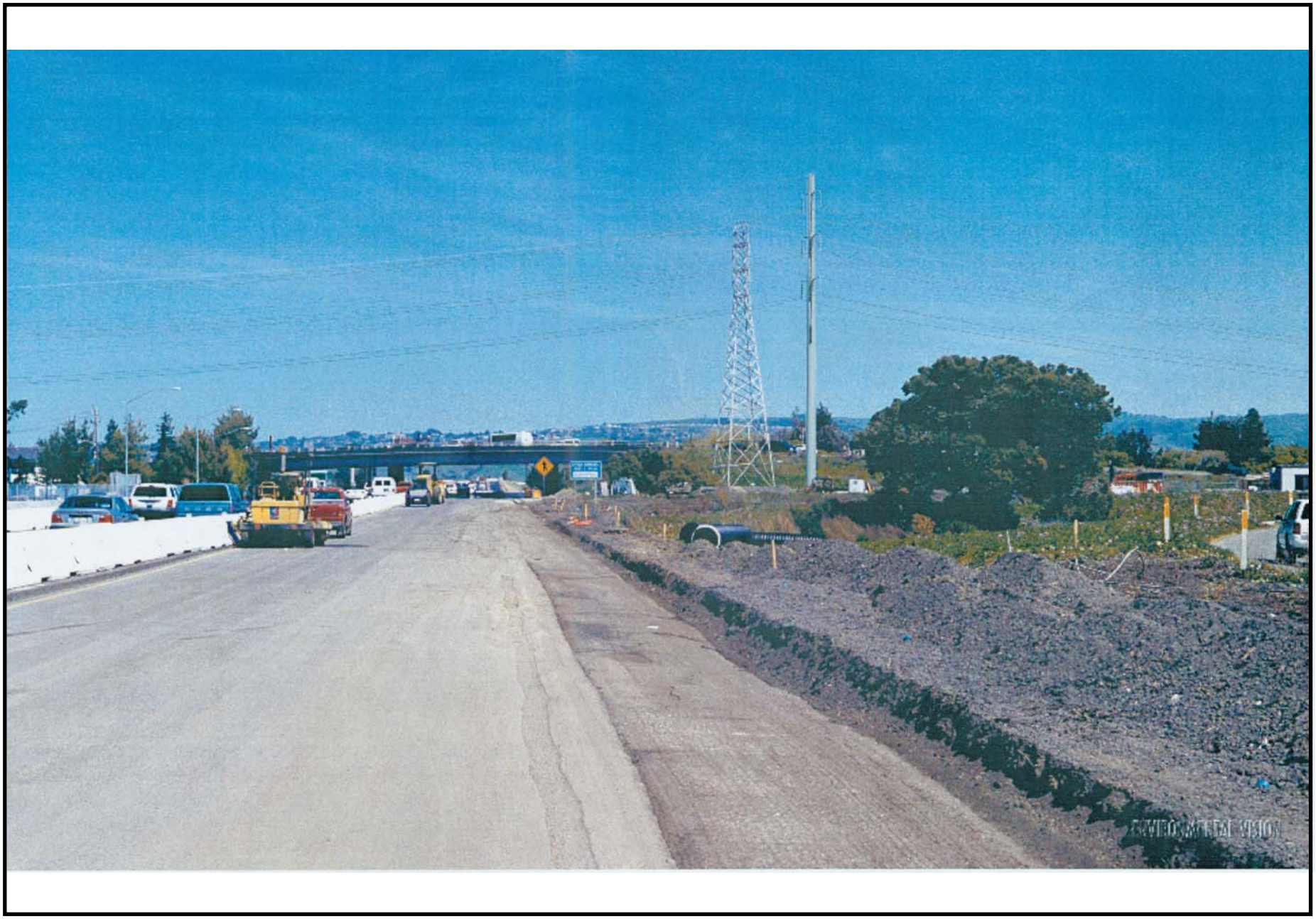
Russell City Energy Center Project - KOP 7 - Existing View from State Route 92 Near Clawiter Road Overpass Looking East

CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: ENVIRONMENTAL VISION

VISUAL RESOURCES - FIGURE 23

Russell City Energy Center Project - Photo Simulation of Original Project's Overhead Transmission Line Crossing at State Route 92



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: ENVIRONMENTAL VISION

WASTE MANAGEMENT

Testimony of Ellie Townsend-Hough

SUMMARY OF CONCLUSIONS

If staff's proposed conditions of certification are implemented, and the measures and remediation proposed in the amendment are executed the management of the waste generated during construction, operation, operation, and existing on site of the Russell City Energy Center (RCEC) would not result in any significant adverse impacts.

INTRODUCTION

On November 17, 2006, the Russell City Energy Company, LLC (project owner) filed a petition with the California Energy Commission to modify the RCEC project. The petition contains several modifications, the most notable being the relocation of the project facilities approximately 1,300 feet northwest of the original location in the City of Hayward (City). All proposed modifications are described in the **Project Description** Section of this document.

This analysis addresses project changes that would be associated with managing wastes generated from constructing and operating the proposed RCEC and any hazardous wastes already existing on-site at its new location. Only those aspects of the RCEC that have changed because of the proposed amendment and that affect staff's testimony for Waste Management, as contained in the Commission Decision (Decision) dated September 11, 2002 (CEC 2002b), are examined. The technical scope of this analysis encompasses solid wastes existing on-site and those generated during facility construction and operation. Wastewater is more fully discussed in the **Soil and Water Resources** section of this document.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS) - COMPLIANCE

The following framework of federal, state, and local environmental laws, ordinances, regulations and standards (LORS) exists to ensure the safe and proper management of hazardous waste from generation to disposal to reduce the risks of accidents that might impact worker and public health and the environment. These provisions have established the basis for staff's determination regarding the significance and acceptability of RCEC with respect to management of waste.

WASTE MANAGEMENT Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	*Description*
Federal	
Title 42, United States Code § 6922 Resource Conservation and	Requires regulations for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

Recovery Act (RCRA)	• Record keeping practices which identify quantities of hazardous wastes generated and their disposition, • Labeling practices and use of appropriate containers, • Use of a manifest system for transportation, and • Submission of periodic reports to the U.S. Environmental Protection Agency (EPA) or authorized state agency.
RCRA Subtitle C	Controls storage, treatment, and disposal of hazardous waste.
RCRA Subtitle D	Regulates design and operation of solid waste landfills.
RCRA 3008(h)	The corrective action program designed to ensure the remediation of hazardous releases and contamination associated with RCRA-regulated facilities.
Title 40, Code of Federal Regulations, part 260	Regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.
State	
California Health and Safety Code §25100 et seq. Hazardous Waste Control Act of 1972, as amended.	Creates the framework under which hazardous wastes must be managed in California. This act mandates that the State Department of Health Services (now the Department of Toxic Substances Control (DTSC) under the California Environmental Protection Agency (Cal/EPA)) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal/EPA and creates a manifest system to be used when transporting such wastes.
Title 14, California Code of Regulations, §17200 et seq. (minimum standards for solid waste handling and disposal)	Set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.
Title 22, California Code of Regulations, §66262.10 et seq. (generator standards)	Establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off-site, and use only permitted treatment, storage, and disposal facilities. Additionally, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established and are enforced by the Cal-EPA Department of Toxic Substances Control.
Title 22, California Code of Regulations, §67100.1 et seq.	Hazardous Waste Source Reduction and Management Review. These sections establish reporting requirements for generators of certain hazardous and extremely hazardous wastes in excess of specified limits. The required reports must indicate the generator's waste management plans and performance over the reporting period.
The Asbestos Airborne Toxic Control Measure	Adopted by the California Air Resources Board (CARB) adopted the Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations. The ATCM requires specific mitigation measures to prevent off-site migration of asbestos-

	containing dust.
Title 8 California Code of Regulations §1529 and §5208	Requiring the proper removal of asbestos containing materials and are enforced by California Occupational Safety and Health Administration (Cal-OSHA).
Public Resources Code Section 41780	States that each city and counties in the State of California to manage waste disposal through the implementation of the Source Reduction and Recycling Element. Under the Source Reduction and Recycling Element, counties would achieve the mandated diversion goals through the implementation of diversion programs.
The Porter-Cologne Water Quality Control Act of 1967, Water Code Sec 13000 et seq.	Requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. Those regulations require that the RWQCBs issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
Local	
Alameda County Department of Environmental Health	Administers and enforces the California Integrated Waste Management Act for non-hazardous solid waste for the proposed energy center.
City of Hayward Fire Department, Hazardous Materials Office	Administers and enforces compliance with the Hazardous Waste Enforcement Act. This agency will also regulate hazardous waste management handling and disposal procedures at the proposed energy center.
Chapter 5, Sanitation and Health, City of Hayward Municipal Code - ARTICLE 10 construction and Demolition Debris Waste Reduction and Recycling Requirements	This Article is adopted in order to supplement the provisions of the California Integrated Waste Management Act of 1989, which requires that each jurisdiction in the state divert 50% of discarded materials from landfills by December 31, 2000, and aid in compliance with the Alameda County Waste Reduction and Recycling Act of 1990. The intent of this Article is to Divert building materials from landfills, and process and returns the materials into the economic mainstream, thereby conserving natural resources and stimulating markets for recycled and salvaged materials.

SETTING

The regional setting for the new project has not changed; the new project site is approximately 1,300-feet northwest of the original project site. The new location lies approximately 1.0-mile east of South San Francisco Bay (Bay), which is closer to the Bay's eastern shoreline than the original site.

PROJECT, SITE, AND VICINITY DESCRIPTION

The project owner proposes to construct a 600 megawatt energy generating facility in the east industrial area of the City of Hayward, Alameda County, California. The site is situated adjacent to and south of Depot Road in the east Hayward industrial area. Cabot Road has its southern terminus at Depot Road across from the northeast corner of the site. Enterprise Avenue lies to the south of the site boundary.

The RCEC facility is composed of four parcels. The parcels are identified in the Section 3.13 of the amendment petition and the Phase I Environmental Site Assessments (ESA) as the small and large Eash parcels, located at 3878 and 3862 Depot Road, respectively. The City of Hayward parcel and the Aladdin parcel are also part of the amended project. The large Eash parcel currently has the following uses: a machine shop, wooden pallet fabrication shop and storage yard, lumber yard and a wrought iron fabrication shop. There is also discarded metal storage drums, abandoned vehicles and an abandoned aboveground storage tank located on site. The small Eash parcel contains a storage yard, which contains trucks and vans in various stages of disassembly (RC 2006a Section 3.13.1.1.1).

Other existing uses of the proposed RCEC site include a 5.4-acre Hayward City parcel that is currently used for sewage sludge drying. The Aladdin parcel is currently used as an automobile salvage and dismantling yard consisting of approximately 3.0-acres. Of the 18.8-acres of RCEC property, 16.5-acres will be fenced, including the East Bay Dischargers Authority easement. The construction parking and lay down areas are located east and south of the power plant site and are presently used as an auto storage yard and light industry facility respectively (RC 2006a, Section 3.3.1.1 and CH2MHill 2007a, Data Response 42-1).

PROJECT DESCRIPTION Figure 2 shows the project site, construction parking and lay down areas, and linear facilities. The linear facilities consist of the electric transmission line, natural gas supply line, potable water supply line, and sanitary sewer line. The natural gas pipeline route and a small portion of the transmission line route would be re-located. The natural gas pipeline will connect to the existing Pacific Gas and Electric Company's (PG&E) natural gas pipeline located along the Union Pacific Railroad easement to the east of the project. The pipeline would run entirely under Depot Road for a distance of approximately 3,800-feet. Both the potable water supply line and sanitary sewer line will run south from the RCEC site and connect to the existing City pipelines located under Enterprise Avenue.

There are two alternatives for the new 230 kV transmission line that would run in the existing 115 kV Grant-Eastshore transmission corridor between the RCEC and PG&E's Eastshore Substation. The two alternative routes are shown on **PROJECT DESCRIPTION Figure 2**.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Two issues are addressed in this **Waste Management** section: 1) potential existing site contamination, and 2) the methods used to handle wastes (Class I hazardous wastes, Class II designated wastes, and Class III municipal solid wastes) during construction and operations. The methods and thresholds staff uses for determining significance of impacts are different for these two issues.

For any site proposed for the construction of a power plant in California, the project owner must provide sufficient documentation about the nature of any existing

contamination on the site. Staff requires that at the least a Phase I ESA be prepared and submitted to the Energy Commission for staff's review and evaluation. A Phase I ESA provides a history of use of the site, often as far back as the mid-1800s, and a list of any hazardous waste release within a certain distance of the site. If there were reasonable potential that the site contains hazardous waste, soil or groundwater would be sampled and analyzed as part of a Phase II ESA. The Phase II ESA verifies the level of contamination and the potential for remediation.

Staff may utilize either of two approaches or both for determining if hazardous waste present on the site would pose a risk to on-site workers (construction or operations) or the public. The first approach follows standards promulgated by Cal/EPA, principally by the Department of Toxic Substances Control (DTSC), the Office of Environmental Health Hazard Assessment (OEHHA), and the Regional Water Quality Control Boards (RWQCB). Staff would compare the levels of contaminants found on site with established standards, such as OEHHA California Human Health Screening Levels (CHHSLs). If metals were suspected of being present at unsafe levels, staff would compare those levels to levels that occur naturally in soil or water as tabulated by DTSC or other federal agencies.

The alternative approach involves the preparation of a site-specific Human Health Risk Assessment and, if appropriate, an Ecological Risk Assessment. The human health risk assessment would follow Cal/EPA guidelines and must address all affected populations including the most burdened and compromised receptors. Staff would require the project owner to prepare such an assessment and would require some form of remediation if the human health cancer risk exceeded one-in-one million or the non-cancer hazard index exceeded 1.0. An ecological risk screening evaluation or risk assessment would be required if contaminants might pose a risk to biological receptors. The project owner also would follow Cal/EPA and RWQCB guidelines, and if the ecological risks were significant, appropriate mitigation would be required.

Regarding the management of wastes generated during demolition, construction and operation, staff reviews the project owner's proposed solid and hazardous waste management methods and determines if the methods meet the state standards for waste reduction and recycling. Staff then reviews the available off-site treatment and disposal sites and determines whether the proposed power plant's waste would have a significant impact on the allotted daily, yearly, or lifetime volume of waste the disposal site is allowed to receive. Staff uses a threshold of less than 10 percent impact on a waste disposal facility to determine if the impact would be significant.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Existing Contamination

The goal of completing a thorough analysis of existing contamination at the proposed site is to ensure that the contamination in the soil and groundwater not pose significant risk to workers (construction, maintenance and operators) and/or the environment prior to construction of the power plant.

The Phase I and II ESAs were completed on each of the four parcels. Combined, the parcels contained a machine shop, wooden pallet fabrication shop, a lumber company, battery storage, above-ground storage tanks, dismantled vehicles, an industrial non-potable water well, an abandoned water well and a groundwater monitoring well (RC 2006a Section 13.1.1.1). The Phase II ESA test results indicate varying levels of petroleum hydrocarbons, polychlorinated biphenyls (PCBs), herbicides, pesticides, volatile organic compounds (VOCs), semi-VOCs (SVOC), and metals were on the parcels in varying degrees (LFA 2006a, LFR 20006b, LFR 2006c, LFR 2006d, LFR 2006e).

Residual chemicals above the industrial Environmental Screening Levels (ESL) levels were found in the industrial soils. PCBs were detected in several locations on the Eash parcel. Groundwater sampling determined that the shallow groundwater contained selenium, MTBE, 1, 1-dichloroethane, and 1, 1-dichloroethene above industrial ESL levels (RC 2006a Section 3.13.1.1.6). The soil and groundwater quality data were based on comparison to the San Francisco Regional Water Quality Control Board (SFRWQCB) Environmental Screening Levels (ESLs) for soil and groundwater for commercial and industrial properties where the groundwater is a potential source of drinking water. The ESLs were developed for the following pathways and environmental concerns: protection of human health, direct/indirect exposure to affected soil, emission of subsurface vapors to building interiors, protection of groundwater quality, protection of terrestrial (non-human) biota, protection against nuisance concerns (odors, etc.), and general resource degradation (RC 2006a Section 3.13.1.1.3).

Staff did not require an ecological risk assessment from RCEC. The goal of the ecological risk assessment is to predict potential adverse effects and when appropriate, to measure existing adverse effects, of chemical contaminants on the biota on or near a site or facility, and to determine levels of those chemicals in the environment that would not be expected to adversely affect the biota. The proposed project site would not cause direct loss of wetlands. The new project site does not represent sensitive species habitat. Review **Biological Resources** for further information.

During any soil disturbance for demolition and construction purposes at RCEC, onsite workers, site visitors, and the public could be exposed to the residual pesticides, PCBs, elevated levels of metals, or other contamination. Anticipating potential problems and using written procedures to establish how these problems will be addressed can minimize undue delays and stoppages. Condition of Certification **WASTE-10** requires preparation of a Soils Management Plan (SMP) so that contractors and others, through site-specific information, can better manage environmental and health and safety contingencies at RCEC. In accordance with Condition of Certification **WASTE-9** and **WASTE-10,** the Hayward Fire Department has agreed to monitor site investigation and cleanup in conjunction with the SFRWQCB.

DTSC and the SFRWQCB recommended the Hayward Fire Department (Fire Department) be the administering agency. As the administering agency the Fire Department would be the initial contact agency to prepare the site for both remediation and construction activities. The Commission, Fire Department and SFRWQCB regulatory authorities come together collectively in the RCEC Waste Conditions of

Certification. The Fire Department agreed to act as administering agency in consultation with either the DTSC or the SFRWQCB. Due to the close proximity to the Bay and potential of petroleum hydrocarbon contamination, the Fire Department expects to work with the SFRWQCB.

The project owner would need to enter into a cost recovery agreement with SFRWQCB to assist the Hayward Fire Department, see Condition of Certification **WASTE 6.** The project owner shall also provide cost recovery to the Hayward Fire Department as well. This cost recovery agreement would be consistent with the Cooperation and Option Agreement has been arranged between RCEC, LLC and the city of Hayward, California.

Construction Impacts and Mitigation

Site preparation and construction of the proposed generating plant and associated facilities would last approximately 25 months, and would generate both nonhazardous and hazardous wastes in solid and liquid forms (RC 2006a Section 3.13). Before construction can begin, the project owner must develop and implement a Construction Waste Management Plan per proposed Condition of Certification **WASTE-2**.

Nonhazardous solid wastes generated during construction would include up to 35 tons of wood, paper, glass, and plastic waste products. An estimated 1,000 tons of concrete will be disposed of during demolition. Up to 38 tons of metal wastes will be generated (RC 2006a Table 3.13-7). All non-hazardous wastes would be recycled to the extent possible, refer to Chapter 5 Article 10 of the Sanitation and Health Section of the city of Hayward California Municipal Code. Non-recyclable wastes would be collected by a licensed hauler and disposed of in a solid waste disposal facility, per Title 14, California Code of Regulations, §17200 et seq.

Nonhazardous liquid wastes would be generated during construction, and are discussed in the **Soil and Water Resources** section of this document. Storm water runoff would be managed in accordance with a Drainage, Erosion and Sediment Control Plan that would be prepared for the project and approved prior to construction. Other wastewaters would be sampled to determine their disposal.

Since excavation activities and trenching during construction of the proposed project may encounter potentially contaminated soils specific handling, disposal, and other precautions may be necessary per 22 CCR 66262.10. Staff concludes that proposed Conditions of Certification **WASTE-1**,**WASTE-7**, **WASTE-3, WASTE-4, WASTE-9,** and **WASTE-10** would be adequate to address any soil contamination contingency that may be encountered during construction of the project and would ensure compliance with 22 CCR 66262.10.

The project owner would be considered the generator of hazardous wastes at this site during the construction period and therefore, prior to construction, the project owner would be required to obtain a unique hazardous waste generator identification number from DTSC in accordance with DTSC regulatory authority, pursuant to proposed Condition of Certification **WASTE-7**. Wastes would be accumulated at satellite locations and then transported daily to the construction contractor's 90-day hazardous waste storage area located in the construction laydown area in response to California

Code of Regulations, Title 22, et seq. 66262.34. The wastes thus accumulated would be properly manifested, transported and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies. Should any construction waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed Condition of Certification **WASTE-1** to notify the Compliance Project Manager (CPM) whenever the owner becomes aware of this action.

Operation Impacts and Mitigation

The proposed RCEC would generate both nonhazardous and hazardous wastes in solid and liquid forms under normal operating conditions. Before operations can begin, the project owner would be required to develop and implement an Operations Waste Management Plan pursuant to proposed Condition of Certification **WASTE-2**.

Nonhazardous Solid Wastes

Nonhazardous solid wastes anticipated to be generated during operation include maintenance wastes and office wastes. The Advanced Water Treatment (AWT) plant has been dropped from the project and has been replaced with an on-site Title 22 Recycled Water Facility (RWF). In addition, a Zero Liquid Discharge (ZLD) system has been added to the project. Wastewater from the cooling tower will no longer be treated on-site and returned to the City of Hayward's Water Pollution Control Facility (WPCF) for disposal through the East Bay Dischargers Authority outfall pipeline to the Bay. Instead, cooling tower blowdown will be sent to the ZLD system.

The ZLD system will evaporate the water, and the solids will be compacted into a salt cake to be tested and disposed of off-site at an appropriate disposal site. For more information, see the **Soil & Water Resources** section. The expected annual salt cake generation is estimated at 4,000 tons.

Nonhazardous Liquid Wastes

Nonhazardous liquid wastes, plant drainage from equipment area, contact stormwater, clarifier sludge, and sanitary wastewater, would be generated during facility operation, and are discussed in the **Soil & Water Resources** section of this document. Storm water runoff would be managed in accordance with a Drainage, Erosion and Sediment Control Plan. General facility drainage will consist of area washdown, sample drains, equipment leakage and drainage from facility equipment areas and would be discharged to the waste water collection system.

Hazardous Wastes

The project owner would be the generator of hazardous wastes at this site during operations. The project owner's unique hazardous waste generator identification number obtained during construction would still be required for generation of hazardous waste during operation, pursuant to proposed Condition of Certification **WASTE-7.**

The potential for accidental hazardous material release to the environment is extremely small (see **Hazardous Materials** section). The existing LORS ensure that the environment is protected. The remaining hazardous waste (oil, diesel, catalyst, etc.) would be temporarily stored on-site pursuant to the California Fire Code and Title 22, California Code of Regulations, Section 66262.10 et seq. and then waste will be

disposed of by licensed hazardous waste collection and disposal companies in accordance with all applicable regulations, pursuant to Title 22, California Code of Regulations, and Section 66262.10 et seq. Should any operations waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed Condition of Certification **WASTE-1** to notify the CPM whenever the owner becomes aware of this action.

Impact on Existing Waste Disposal Facilities

Nonhazardous Solid Wastes

Nonhazardous waste disposal sites suitable for discarding project-related construction and operation wastes are identified in Section 3.13 of the amendment petition (RC 2006a Table 3.13-8). During construction of the proposed project, 1,073 tons of solid waste will be generated and disposed of in solid waste management landfills. The nonhazardous solid wastes generated yearly at RCEC would be recycled if possible, or disposed of in a Class III landfill.

There are two landfills listed in Table 3.13-8 of the amendment, they are located in Alameda county with 136 million cubic yards of remaining capacity. The total amount of nonhazardous waste generated from project construction and operation will contribute less than one percent of available landfill capacity. Staff finds that disposal of the solid wastes generated by RCEC can occur without significantly impacting the capacity or remaining life of any of these facilities.

Hazardous Wastes

The 4,000 tons per year of ZLD salt cake will be tested to confirm if it is nonhazardous; however, if the waste is determined hazardous waste, there is adequate landfill capacity. Section 3.13.1.3.2 of the amendment discusses the two Class I landfills in California: The Clean Harbors' Buttonwillow Landfill in Kern County, and the Chemical Waste Management's Kettleman Hills Landfill in Kings County. The Kettleman Hills facility also accepts Class II and Class III wastes. In total, there is an excess of 16 million cubic yards of remaining hazardous waste disposal capacity at these landfills, these landfills will be in operation until 2023. In addition, the Kettleman Hills facility is in the process of permitting an additional 15 million cubic yards of disposal capacity, and the Buttonwillow facility is not expected to reach its capacity until 2030 at current disposal rates.

In the **Socioeconomics** section of this staff analysis, staff presents census tract information that shows that there are minority populations within one mile and six miles of the project. Since staff has added conditions of certification that would reduce the risk associated with hazardous waste to an insignificant level, staff concludes that there will be no significant impact from construction or operation of the power plant on minority populations. Therefore, there are no environmental justice issues for Waste Management.

CUMULATIVE IMPACTS AND MITIGATION

There are three projects, RCEC, Eastshore Energy Center (EEC) and the Route 92/I-880 Interchange Reconstruction Project proposed to be located in Alameda County. As proposed, the quantities of solid waste and hazardous wastes generated during

construction and operation of the all three projects would add to the total quantities of waste generated in the State of California. Both RCEC and EEC propose to use the same Class II and III landfills. Combined the Altamont and Vasco Road landfills have 155,742,205 cubic yards of capacity remaining. During construction of the power plant projects, the proposed projects will generate less than 12,000 cubic yards of non-hazardous waste. Staff does not have an estimate on how much waste the Route 92 project would generate at this time, recycling efforts would be prioritized wherever practical in conformance with Title 14, California Code of Regulations, capacity is available in a variety of treatment and disposal facilities. Due to the minor amounts of wastes generated during project construction and operation, the insignificant impacts on individual disposal facilities and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous waste disposal.

COMPLIANCE WITH LORS

Energy Commission staff concludes that the RCEC would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during facility demolition, construction and operation, and the remediation of any soil or groundwater contamination. The project owner is required to dispose of hazardous and non-hazardous wastes at facilities approved by the various departments within Cal/EPA. Because hazardous wastes would be produced during project demolition, construction, and operation, the RCEC would be required to obtain a hazardous waste generator identification number from DTSC. Accordingly, RCEC would be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, keep detailed records, and appropriately train employees. Pursuant to California Code of Regulations, the RCEC must prepare Title 22, section 67100.1 et seq., a hazardous waste Source Reduction, Evaluation Review, and Plan.

Energy Commission staff's objectives in its waste management analysis are to ensure that:

- The management of the wastes would be in compliance with all applicable LORS Compliance with LORS ensures that wastes generated during the demolition, construction and operation of the proposed project would be managed in an environmentally safe manner.
- The disposal of project wastes would not result in significant adverse impacts to existing waste disposal facilities. Project owner will use waste minimization and recycling techniques prior to the disposal of the waste.
- Upon project completion, the site would be is managed in such a manner that contaminants would not pose a significant risk to humans or the environment.
- With the adoption and implementation of the Conditions of Certification, the project would comply with the LORS required for the remediation of contaminated soils and groundwater on the project site.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff received comments on the Russell City Energy Center Petition for Amendment from DTSC, the SFRWQCB and the Hayward Fire Department. The agencies also reviewed the Limited Soil and Groundwater Sampling Report for 3878 Depot Road, Phase II ESAs at 3810 Depot Road and 3700 Enterprise Avenue, Additional Soil and Groundwater Sampling at 3862 and 3878 Depot Road, Hayward California documents.

A March 1, 2007 letter from DTSC outlined areas that required additional information concerning the level of existing contamination at the proposed project site. DTSC acknowledged that the proposed site has similar environmental impacts that many properties in urban areas encounter. DTSC indicated that RCEC would require the development and implementation of a Soil Management Plan and a Cleanup Plan. The Soil Management Plan would address the additional site characterization activities. The Cleanup Plan would cover the period of time during construction and operation of the power generation facility. It is also important that there is a record of appropriate land restrictions if contaminants are left in the soil as part of the RCEC cleanup effort above levels safe for possible future residential use.

The Soil Management Plan and Cleanup Plan shall include the following information as required in Conditions of Certification **WASTE-9** and **WASTE-10**:

a. A requirement that land use controls be executed and recorded and an implementation and enforcement plan be approved by the environmental oversight agency if the site is not cleaned up to standards appropriate for unrestricted use;
b. The screening levels used to determine when soil must be removed and/or addressed;
c. The specific locations where soil must be removed based upon existing data;
d. Plans for handling, storing, stockpiling, profiling and disposing of excavated soil;
e. Plans and requirements for confirmation sampling and analysis;
f. Plans for filling existing data gaps in information and in sampling data; and
g. A contingency plan outlining the steps that shall be taken if additional contamination is discovered during the course of implementing the Cleanup Plan or Soil Management Plan and during the development of the property.

LFR, RCEC's environmental consultants, addressed DTSC'S comments with a March 27, 2007 letter. SFRWQCB addressed LFR's March 27, 2007 letter, via an April 30, 2007 email. SFRWQCB suggested that proper groundwater characterization is warranted at the proposed project site. SFRWQCB comments recommended that consideration be given to sampling below the biosolids drying area, below the wood treatment area and below the Metal Master's building for evidence of impacts related the construction of the proposed project. The Phase I ESA indicates that a groundwater monitoring well was present at the 3878 Depot Road property. The SFRWQCB recommended the project owner close existing wells on the proposed RCEC site to prevent vertical conduits. To ensure that contaminants do not pose a risk to workers staff added Conditions of Certification **WASTE-8** and **WASTE-12**. A discussion of groundwater is provided in the **Water Resources** Section of this Staff Assessment.

The Hayward Fire Department will assume the responsibility as the administering agency reviewing the Soils Management Plan and the Cleanup Plan in with the SFRWQCB.

CONCLUSIONS

Management of the waste generated during demolition, construction and operation of the RCEC or those associated with remediation of existing on-site contamination would not result in any significant adverse impacts if the measures and remediation proposed in the amendment petition and staff's proposed conditions of certification are implemented. Potential contamination and remediation on the proposed project site is to be reviewed and overseen by the Commission, Hayward Fire Department and the SFRWQCB. With staff's proposed mitigation, potential waste management impacts will be reduced to less than significant for the environment and all people within the affected area, including the minority population.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of at least 120 days prior to any ground disturbance, which include those activities associated with site mobilization, or grading as defined in the General Conditions of Certification becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-2 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CEC CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 30 days prior to the start of construction, the project owner shall submit the Construction Waste Management Plan to the CPM for ~~review~~ for approval. The Operation Waste Management Plan shall be submitted no less than 30 days prior to the start of project operation for approval. The project owner shall submit

any required revisions within 20 days of notification by the CPM (or mutually agreed upon date).

In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year and provide a comparison of the actual methods used to those proposed in the original Operation Waste Management Plan.

WASTE-3 The project owner shall have a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies, available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of construction, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist to the CPM for approval.

WASTE-4 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the San Francisco Bay Regional Water Quality Control Board, ~~the Alameda County Department of Environmental Health,~~ City of Hayward Fire Department Hazardous Materials Office, and the Berkeley Regional Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM within 5 days of their receipt.

~~**WASTE-5** The project owner shall prepare a Remedial Action Plan (RAP) for the known soil and groundwater contamination present on the Runnells Industry portion of the site and submit this plan to the SFRWQCB, the City of Hayward Fire Department Hazardous Materials Office, and the CPM. This RAP shall include a schedule for the remediation of the site prior to the commencement of construction activities.~~

~~**Verification:** Sixty (60) days prior to any earth moving activities, the project owner shall submit the RAP to the SFRWQCB, the City of Hayward Fire Department Hazardous Materials Office, and the CPM for approval 60 days prior to any earth moving activities, including those associated with site mobilization, ground disturbance, or grading as defined in the general conditions of certification.~~

WASTE-5 The project owner shall ensure that the ZLD salt cake is tested twice the first year of operation as per 22 CCR 66262.10 and report the findings to the CPM.

Verification: The project owner shall include the results of salt cake testing in annual report provided to the CPM. If two consecutive tests, taken six months apart, show that the sludge is non-hazardous, the project owner may apply to the CPM to discontinue testing.

~~**WASTE-6** The project owner shall provide a soil management work plan providing the methods, which will be used to properly handle, and/or dispose of soil which may be classified as hazardous or contain contaminants at levels of potential concern. The work plan will discuss, as necessary, the reuse of soil on site in accordance with applicable criteria to protect construction or future workers onsite, disposal of soil to a Class I (hazardous) landfill, and disposal to a Class II or III landfill. This work plan may be submitted as part of the RAP.~~

~~**Verification:** The project owner shall submit the soil management work plan to the CPM for approval 60 days prior to any earth moving activities, including those associated with site mobilization, ground disturbance, or grading as defined in the general conditions of certification.~~

WASTE-6 Prior to site mobilization, the project owner shall enter in to a cost recovery agreement with the Hayward Fire Department and the San Francisco Bay Regional Water Quality Control Board, These agreements will assist agencies' review of the clean-up, demolition, construction and operation of the Russell City Energy Center Project.

Verification: The project owner shall submit copies of cost recovery agreements to the CPM, at least 60 days prior to start of construction.

WASTE-7 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM via the monthly compliance report of its receipt.

WASTE-8 The project owner shall sample and submit sampling results of groundwater below the biosolids drying area, the wood treatment area and the Metal Master's building for the following constituents: Total Petroleum Hydrocarbons, Volatile and Semi-Volatile Compounds, Polychlorinated Biphenyls, metals, and chlorinated herbicides.

Verification: The project shall submit the groundwater sampling report to the San Francisco Bay Regional Water Quality Control Board and Hayward Fire Department at least 120 days prior to start of construction. At least 30 days prior to the start of commercial operations, if the groundwater is found to be contaminated the project owner shall submit to the CPM documentation that the groundwater sampling report has been recorded as part of the Environmental Restrictions required by **WASTE-11**.

WASTE-9 Prior to any earthwork, the project owner shall prepare and submit to the City of Hayward Fire Department, San Francisco Bay Regional Water Quality Control Board, and the CPM for approval, a Soils Management Plan (SMP). The SMP must be prepared by a California Registered Geologist, a California Certified Engineering Geologist, or a California Registered Civil Engineer with sufficient experience in hazardous waste management. The SMP should include but is not limited to the following:

- Land use history, including description and locations of known contamination,
- An earthwork schedule;
- A SMP summary report, which includes all analytical data and other findings, must be submitted once the earthwork has been completed;
- The project owner shall describe methods which will be used to properly handle and/or dispose of soil which may be classified as hazardous or contain contaminants at levels of potential concern;
- The SMP will discuss, as necessary, the reuse of soil on site in accordance with applicable criteria to protect construction or future workers onsite; and
- This SMP may be submitted as part of the Cleanup Plan.

Verification: At least 120 days prior to any earthwork, including those earthwork activities associated with site mobilization, ground disturbance, or grading as defined in the general conditions of certification the project owner shall submit the Soils Management Plan to the City of Hayward Fire Department and the San Francisco Bay Regional Water Quality Control Board for review and comment, and to the CPM for approval. At least 30 days prior to the start of commercial operations, and after approval of the SMP, the project owner shall submit to the CPM documentation that the SMP has been recorded as part of the Environmental Restrictions.

WASTE-10 The project owner shall ensure that the site is properly characterized and remediated. The project owner shall consult with the City of Hayward Fire Department and the San Francisco Bay Regional Water Quality Control Board in preparing a Site Cleanup Plan for soil and groundwater contamination present on the RCEC site in compliance with Porter-Cologne Water Quality Act, California Water Code Section 13267. The project owner shall submit this plan to both the City of Hayward Fire Department and the San Francisco Bay Regional Water Quality Control Board for review and comment and to the CPM. The Site Cleanup Plan shall present cleanup goals, remediation alternatives considered, and measures selected to address human health risks. This Site Cleanup Plan shall include a schedule for the remediation of the site prior to the commencement of ground disturbance and shall also include a copy of all correspondence between the project owner and the Hayward Fire Department on matters regarding the RCEC Site Cleanup Plan.

Verification: At least 120 days prior to any ground disturbance, which include those activities associated with site mobilization, or grading as defined in the General conditions of certification the project owner shall submit the Site Cleanup Plan to the City of Hayward Fire Department, and the San Francisco Bay Regional Water Quality

Control Board and the CPM. At least 30 days prior to any ground disturbance, the CPM, will discuss with the Hayward Fire Department and the San Francisco Bay Regional Water Quality Control Board, and shall determine whether the project owner has satisfactorily implemented the Site Cleanup Plan and, if so, allow grading/construction to begin.

WASTE-11 Following completion of the merger and/or lot line adjustment(s) associated with Condition of Certification **LAND -2**, the project owner shall execute and record a deed for the project site, as identified in the Certificate of Merger and/or Notice of Lot Line Adjustment, with the City of Hayward Recorders Office, which shall include a map and detailed description identifying any easements, restrictions, and limitations on the use of the property, with regard to any hazardous materials, wastes, constituents, or substances remaining on-site following closure of the proposed power plant. The project owner shall also file a Covenant and Environmental Restriction on Property with the San Francisco Bay Regional Water Quality Control Board identifying any hazardous materials, wastes, constituents, or substances that would remain at the property after closure of the power plant at levels that are not suitable for unrestricted use of the land.

Verification: The project owner shall provide copies of the deed and any attachments, with proof of recordation, and the Covenant and Environmental Restriction on Property, with proof of submittal, to the CPM, as part of the compliance package at least 30 days prior to plant closure or sale of property.

WASTE-12 The project owner shall properly destroy groundwater monitoring wells not in use as required by Alameda County Public Works, the City of Hayward Fire Department, the San Francisco Bay Regional Water Quality Control Board, and the Alameda County Water District.

Verification: The project owner shall provide evidence to the CPM that the wells have been destroyed in accordance with Alameda County Public Works, the City of Hayward Fire Department, the San Francisco Bay Regional Water Quality Control Board, and the Alameda County Water District requirements.

REFERENCES

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.

CEC 2007a – California Energy Commission/E. Townsend-Hough (tn: 39182). Comments from Janet Niato/Department of Toxic Substance Control. 02/01/2007. Rec'd 02/05/2007.

CH2MHILL 2007a – CH2MHILL/D.M. Davy (tn: 38948). 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.

CRWQB 2006a – CRWQB/B. Wines (tn: 38743). Comments on the Request for Agency Participation in the Review of the Russell City Energy Company, LLC, Amendment Petition – SCH No. 200509293. 12/20/2006. Rec'd 12/21/2006.

LFR 2006a – LFR/Levine - Fricke (tn: 38484). Limited Soil and Groundwater Sampling Report, 3862 and 3878 Depot Rd. Hayward Ca – 001-09301-00. 04/08/2005. Rec'd 11/17/2006.

LFR 2006b – LFR/Levine – Fricke (tn: 38487). Draft Phase 1 Environmental Site Assessment – Parcel #001-09301-01. 09/13/2006. Rec'd 11/17/2006.

LFR 2006c – LFR/Levine – Fricke (tn: 38488). Phase 1 Environmental Site Assessment Parcel #001-09301-00. 12/02/2004. Rec'd 11/17/2006.

LFR 2006d – LFR/Levine – Fricke (tn: 38489). Phase 1 Environmental Site Assessment Two Parcels on Enterprise Ave. Parcel #001-09301-00. 10/21/2005. Rec'd 11/17/2006.

LFR 2006e – LFR/Levine – Fricke (tn: 38490). Revised Draft Phase II Environmental Site Assessments Parcel #001-09301-01. 11/08/2006. Rec'd 11/17/2006.

RC 2006a – Russell City/M. Hatfield (tn: 38410). Petition for Amendment NO. 1, Russell City Energy Center. 11/17/2006. Rec'd 11/17/2006.

WORKER SAFETY AND FIRE PROTECTION

Testimony of Alvin J. Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

Staff concludes that, for the most part, the proposed changes to the Russell City Energy Center (RCEC) do not significantly change the analysis conducted for the original project in the area of worker safety and fire protection. However, recent staff assessments and changes in the conditions of certification require amending an existing condition and adding three new ones.

INTRODUCTION

This analysis focused only on changes to the original RCEC that may affect worker safety and fire protection. (See original Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.) The changes evaluated in this assessment include the relocation of the project site, the changes to cooling technology and water recycling systems, the relocation of a small portion of the transmission line, the new natural gas pipeline route, and the new laydown area. The original analysis for worker safety and fire protection issues can be found in the Final Staff Assessment (FSA) dated June 2002 (CEC 2002a).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS) - COMPLIANCE

There are no new LORS affecting this project in the area of worker safety and fire protection.

SETTING

The RCEC Amendment proposes to relocate the project site about 1,300 feet north and west, as well as rearrange the site plan and change portions of the transmission line and gas pipeline routes. Please refer to the Project Description section for more details.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The method and thresholds for determining significance for worker safety and fire protection have not changed from those described in the 2002 FSA for the original RCEC project (CEC 2002a).Direct/Indirect Impacts and Mitigation

Construction Impacts and Mitigation

The project owner stated in the RCEC Amendment that all workers will undergo proper training according to applicable LORS and therefore there are no worker safety and fire

protection impacts that are different than those analyzed previously for the original project (RCEC 2006a). Staff agrees that, for the most part, the project amendment does not add or change impacts to worker safety and fire protection during the construction phase beyond those assessed in the original FSA. However, since the time of certification, staff has amended, developed, and proposed conditions of certification to address the generic issues of worker safety during the construction phase.

Original Condition of Certification **WORKER SAFETY-2** is amended to remove the requirement that the California Occupational Safety and Health Administration (Cal-OSHA) Consultation Service review and comment on the required Safety and Health Programs. Cal-OSHA has notified staff that it no longer wishes to review those plans.

Also since the original date of certification, staff has found that protecting construction workers from injury and disease is among the greatest challenges in occupational safety and health and that the hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large complex industrial type projects such as the construction of gas-fired power plants. To reduce and/or eliminate these hazards, it has become standard industry practice to hire a Construction Safety Supervisor to ensure a safe and healthful environment for all personnel. This has been evident in the audits of power plants under construction recently conducted by the staff. The Federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors to improve their safety and health performance; to assist them in striving for the elimination of the four hazards (falls, electrical, caught in/between and struck-by hazards) which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections; to prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and to recognize those subcontractors with exemplary safety and health programs.

To date, there are no OSHA or Cal-OSHA requirements that an employer hire or provide for a Construction Safety Officer. OSHA and Cal-OSHA regulations do, however, require that safety be provided by an employer and the term “Competent Person” is used in many OSHA and Cal-OSHA standards, documents, and directives. A “Competent Person” is usually defined by OSHA as an individual, who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Therefore, to meet the intent of the OSHA standard to provide for a safe workplace during power plant construction, staff proposes new Condition of Certification **WORKER SAFETY-3** which would require the applicant/project owner to designate and provide for a power plant site Construction Safety Supervisor.

As discussed above, the hazards associated with the construction industry are well documented. Accidents, fires, and a worker death have occurred at Energy

Commission-certified power plants in the recent past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by Energy Commission staff in safety audits conducted in 2005 at several power plants under construction. The findings of the audit staff, include, but are not limited to, such safety oversights as:

- Lack of posted confined space warning placards/signs;
- Confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- Confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to commissioning team and then to operations;
- Dangerous placement of hydraulic elevated platforms under each other;
- Inappropriate placement of fire extinguishers near hotwork;
- Dangerous placement of numerous power cords in standing water on the site thus increasing the risk of electrocution;
- Construction of an unsafe aqueous ammonia unloading pad; and
- Inappropriate and unsecure placement of above-ground natural gas pipelines inside the facility but too close to the perimeter fence.
- Lack of adequate employee or contractor written training programs addressing proper procedures to follow in the event of finding suspicious packages or objects either on- or off-site.

To reduce and/or eliminate these hazards, staff recommends the placement of a safety professional to monitor on-site compliance with Cal-OSHA regulations and periodically audit safety compliance during construction, commissioning, and the hand-over to operational status. These requirements are outlined in Condition of Certification **WORKER SAFETY-4**. This Safety Monitor, hired by the project owner yet reporting to the CPM through the CBO, will serve as an “extra set of eyes” to ensure that safety procedures and practices are fully implemented at power plants certified by the Energy Commission.

During the audits conducted by staff, most site safety personnel welcomed the audit team and actively engaged them in questions about the team’s findings and recommendations. These safety professionals recognized that safety requires continuous vigilance and that the presence of an independent audit team provided a “fresh perspective” of the site.

Operation Impacts and Mitigation

The project owner stated in the RCEC Amendment that all workers will undergo proper training according to applicable LORS and therefore there are no worker safety and fire protection impacts that are different than those analyzed previously for the original project (RCEC 2006a). Staff for the most part agrees that the project amendment does not add or change impacts to worker safety and fire protection during the operations

phase beyond those assessed in the original FSA. However, since the time of certification, staff has developed and proposed a worker safety condition of certification to address a generic worker safety issue during the operations phase.

A state-wide survey was conducted by staff to determine the frequency of emergency medical response (EMS) and off-site fire-fighter response for natural gas-fired power plants in California. The purpose of the analysis was to determine what impact, if any, power plants may have on local emergency services. Staff has concluded that incidents at power plants that require fire or EMS response are infrequent and represent an insignificant impact on the local fire departments, except for rare instances where a rural fire department has mostly volunteer fire-fighting staff. However, staff has determined that the potential for both work-related and non-work related heart attacks exists at power plants. In fact, staff's research on the frequency of EMS response to gas-fired power plants shows that many of the responses for cardiac emergencies involved non-work related incidences, including visitors. The need for prompt response within a few minutes is well documented in the medical literature. Staff believes that the quickest medical intervention can only be achieved with the use of an on-site defibrillator; the response from an off-site provider would take longer regardless of the provider location. This fact is also well documented and serves as the basis for many private and public locations (e.g., airports, factories, government buildings) maintaining on-site cardiac defibrillation devices. Therefore, staff concludes that with the advent of modern cost-effective cardiac defibrillation devices, it is proper in a power plant environment to maintain such a devise on-site in order to convert cardiac arrhythmias resulting from industrial accidents or other non-work related causes. Therefore, an additional condition (**WORKER SAFETY-5**) is proposed which would require that a portable automatic cardiac defibrillator be located on site.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments on Worker Safety and Fire Prevention were received form the public or agencies. The project owner made several comments that are addressed below.

Comment: The project owner provided comments on the proposed change to Condition **WORKER SAFETY-2**. The owner agreed with Staff's proposed deletion of the requirement for Cal-OSHA Consultation Service to review and comment on the Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program in **WORKER SAFETY-2** and requested that this should be indicated in redline-strikeout, for clarity.

*Response: Staff agrees and this version of the Staff Assessment contains **WORKER SAFETY-2** with the appropriate language in strike out format.*

Comment: The project owner also provided comments on *Condition* **WORKER SAFETY-3 and -4.** While the owner did not object to the substance of these two Conditions, the owner proposed the use of language from an earlier siting decision, the Inland Empire Energy Center.

Response: Staff considered the owner's suggestion and notes that the owner admits that the Inland condition does not differ substantively from the condition staff proposes

for the RCEC. Since staff's Condition has been applied at all other power plants since 2004 and is working well, staff finds no reason to alter the Condition.

CONCLUSIONS

Staff concludes that the proposed RCEC amendment does not, for the most part, significantly change the analysis conducted for the original project in the area of worker safety and fire protection. Although the general nature of hazards and therefore the impacts to workers safety and fire protection have not changed with this amendment, staff believes that workplace safety measures have advanced in the interim and therefore proposes mitigation measures to further reduce impacts on worker safety and fire protection to insignificance. Staff also recommends a minor amendment of one existing condition.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of the Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout is used to indicate deleted language and underline for new language.

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) a copy of the project Construction Safety and Health Program containing the following:

- A Construction Safety Program;
- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Emergency Action Plan; and
- A Construction Fire Protection and Prevention Plan.

The Safety Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the City of Hayward Fire Department for review and comment prior to submittal to the CPM.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the project Construction Injury and Illness Prevention Program. The project owner shall provide a letter from the City of Hayward Fire Department stating that they have reviewed and commented on the Construction the Construction Fire Protection and Prevention Plan and the Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan;
- an Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

~~The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA Consultation Service for review and comment concerning compliance of the program with all applicable Safety Orders.~~ The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the City of Hayward Fire Department for review and comment.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety & Health Program.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have over-all authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA & federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in Worker Safety 1 and 2 are implemented.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement (CSS) shall be submitted to the CPM within one business day of replacement.

- The CSS shall submit in the Monthly Compliance Report a monthly safety inspection report to include:
- Record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- Summary report of safety management actions and safety-related incidents that occurred during the month;
- Report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- Report of accidents and injuries that occurred during the month.

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in Worker Safety 3, implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: Prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable automatic cardiac defibrillator is located on site during construction and operations and shall implement a program to ensure that the recommended number of workers are properly trained in its use and that the equipment is properly maintained and functioning at all times, as per the manufacturer's instructions.

Verification: At least 30 days prior to the start of site mobilization the project owner shall submit to the CPM proof that a portable automatic cardiac defibrillator exists on site and a copy of the training and maintenance program for review and approval.

REFERENCES

California Energy Commission (CEC), 2002a. (tn: 26086). Final Staff Assessment (FSA) and Addendum, Comments on the FSA, published on June 10, 2002.

Petition for Amendment NO. 1, (RCEC), 2006a. Russell City Energy Center. 11/17/2006. Rec'd 11/17/2006.– Russell City/M. Hartfield (tn: 38410).
CEC 2002a – California Energy Commission (tn: 26086). Final Staff Assessment.

California Energy Commission/Commissioners (CEC) 2002b (tn:26635). Decision for Russell City - POS.

ENGINEERING ASSESSMENT

ENGINEERING ASSESSMENT

FACILITY DESIGN

Testimony of Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The Facility Design findings and conclusions incorporated in the original Energy Commission Decision (Decision) remain valid. The Russell City Energy Center (RCEC) project, as amended, would likely comply with all applicable engineering laws, ordinances, regulations, and standards (LORS).

INTRODUCTION

This analysis addresses only those aspects of the RCEC that have changed as a result of the proposed amendment and that affect the project's compliance with engineering LORS. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.) Changes due to the proposed amendment that could affect project facility design include replacing the Advanced Water Treatment Plant with a Zero Liquid Discharge Facility and a Title 22 Recycled Water Facility, and deleting the standby generator (RCEC 2006a, § 1.1).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

The engineering LORS applicable to the project have not changed since the project was certified by the Energy Commission, except the following minor changes. Dames & Moore (1995) Seismic Retrofit Study for the City of Hayward Utility Structures was applicable to design and construction of the Advanced Water Treatment Plant that was planned to be owned by the City of Hayward. Because this facility is no longer part of the project, and as described in the amendment, no other project related utility structures will be owned by the City, this LORS no longer applies to the project. In addition to the above change, the applicable edition of the California Building Code (CBC) shall be revised from 1998 to the current edition, 2001, as shown below. The key engineering LORS are described in **FACILITY DESIGN Table 1**:

FACILITY DESIGN Table 1
Key Engineering Laws, Ordinances, Regulations and Standards (LORS)

Applicable LAW	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
State	2001 California Building Code (CBC)
Local	Alameda County, Regulations and Ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

SETTING

The above project changes proposed in the amendment would result in the following minor modifications to the facility design conditions of certification. The project structures and equipment list would be revised to reflect the substitution of a Title 22 Recycled Water Facility and a Zero Liquid Discharge Facility for the Advanced Water Treatment Plant, and the deletion of the standby generator (RCEC 2006a, § 1.1). All references to 1998 edition of the CBC would be revised to 2001. And, the reference to Dames & Moore (1995) study for the design and construction of the Advanced Water Treatment Plant would be deleted.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Assessment of impacts and discussion of mitigation in the area of Facility Design as described in the Decision have not changed and this amendment does not require any revisions to the original analysis (CEC 2002a FSA, p.46).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no agency or public comments regarding facility design.

CONCLUSIONS

The Facility Design findings and conclusions incorporated in the original Decision remain valid. The project, as amended, would likely comply with all applicable engineering LORS. To ensure this, staff recommends that the conditions of certification embodied in the original Decision be retained, with the following minor revisions.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Energy Commission Decision, with the following exceptions: Condition of Certification **GEN-1** has been modified to reflect the inapplicability of the Dames & Moore study as the result of deleting the Advanced Water Treatment Unit from the project description. Condition of Certification **GEN-2**, **Table 1: Major Structures and Equipment List**, has been revised to reflect the changes in the list of facilities and equipment as described above. Conditions of Certification **GEN-1** through **ELEC-1** have been revised to reflect the current edition of the CBC. Strikeout has been used to indicate deleted language, and underline to indicate new language.

GEN-1 The project owner shall design, construct and inspect the project in accordance with the ~~1998~~<u>2001</u> California Building Code (CBC) and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.) ~~The project owner shall design, construct and inspect the Advanced Water Treatment Unit in accordance with the 1998 CBC~~

~~and the Dames & Moore (1995) report as a minimum standard for seismic design of City owned utility structures.~~ All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

Protocol: In the event that the initial engineering designs are submitted to the CBO when a successor to the ~~1998~~2001 CBC is in effect, the ~~1998~~2001 CBC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable engineering LORS and the Energy Commission Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [~~1998~~2001 CBC, Section 109 – Certificate of Occupancy].

GEN-2 Prior to submittal of the initial engineering designs for CBO review, the project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List, and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in **Table 1** below. Major structures and equipment shall be added to or deleted from the Table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Combustion Turbine (CT) Foundation and Connections	2
Combustion Turbine Generator Foundation and Connections	2
Steam Turbine (ST) Foundation and Connections	1
Steam Turbine Generator Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and	2

Equipment/System	Quantity (Plant)
Connections	
HRSG Stack Foundation and Connections	2
HRSG Stack	2
CT Main Transformer Foundation and Connections	2
ST Main Transformer Foundation and Connections	1
Ammonia Storage Tank Foundation and Connections	1
Switchgear Building Structure, Foundation and Connections	1
Air Compressor Skid Foundation and Connections	1
Cooling Tower Foundation and Connections	1
CT Air Inlet Filter Foundation and Connections	2
Circulating Water Pumps Foundation and Connections	2
Demineralized Water Storage Tank Foundation and Connections	2
Surface Condenser Structure, Foundation and Connections	1
Warehouse/Maintenance Shop Structure, Foundation and Connections	1
Administration Building W/Control Room Structure, Foundation and Connections	1
~~Water Treatment Building/Laboratory~~Title 22 Recycled Water Facility Structure, Foundation and Connections	1
Gas Metering Area Structure, Foundation and Connections	1
Pumphouse Building Structure, Foundation and Connections	1
Boiler Feedwater Pump/Chemical Feed Building Structure, Foundation and Connections	1
Boiler Feedwater Pump Building Structure, Foundation and Connections	1
~~Emergency Generator~~Zero Liquid Discharge Facility Structure, Foundation and Connections	1
Fire Water Pump Building Structure, Foundation and Connections	1
Rotor Air Cooler Foundation and Connections	2
Switchyard Control Room Structure, Foundation and Connections	1
Unit Auxiliary Transformer Foundation and Connections	2
Gas Scrubber/Heater Station Structure, Foundation and Connections	1
Closed Cycle Cooling Water Heat Exchanger Foundation and Connections	2
Closed Cycle Cooling Water Pump Foundation and Connections	2
Chlorination Skid Foundation and Connections	1
Advanced Wastewater Treatment Plant Structure, Foundation and Connections	1
Final Product Storage Tank Foundation and Connections	2
Condensate Pumps Foundation and Connections	3
Demineralized – RO Systems Foundation and Connections	3
Natural Gas Compressors Foundation and Connections	2
Switchyard, Buses, and Towers	I Lot
Potable Water Systems	I Lot
Drainage Systems (including sanitary drain and waste)	I Lot

Equipment/System	Quantity (Plant)
High Pressure Piping	I Lot
HVAC and Refrigeration Systems	I Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the ~~1998~~2001 CBC [Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities).] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

Protocol: The RE shall:

1. Monitor construction progress of work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all the facilities subject to CBO design review and inspection conforms in every material respect to the applicable LORS, these conditions of certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

Protocol: The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [~~1998~~2001 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and
2. Provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B: The geotechnical engineer or civil engineer, experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports, and prepare final soils grading report;
2. Prepare the soils engineering reports required by the ~~1998~~2001 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the ~~1998~~2001 CBC, Appendix Chapter 33, Section 3317, Grading Inspections;
4. Recommend field changes to the civil engineer and RE;
5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and
6. Prepare reports on foundation investigation to comply with the ~~1998~~2001 CBC, Chapter 18 section 1804, Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted

conditions used as a basis for design of earthwork or foundations [~~1998~~2001 CBC, section 104.2.4, Stop orders].

C: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with engineering LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission Decision.

E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the ~~1998~~2001 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

Protocol: The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. Observe the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and

4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

5. A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered in any work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval, and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [~~1998~~2001 CBC, Section 108, Inspections]. The project owner shall retain one set of approved engineering plans, specifications and calculations at the project site or at another accessible location during the operating life of the project [~~1998~~2001 CBC, Section 106.4.2, Retention of plans].

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM in the next Monthly Compliance Report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils report as required by the ~~1998~~2001 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report].

Verification: At least 15 days prior to the start of site grading (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the documents described above to the CBO for design review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthworks and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area [~~1998~~2001 CBC, Section 104.2.4, Stop orders].

Verification: The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the ~~1998~~2001 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site grading operations for which a grading permit is required shall be subject to inspection by the CBO.

Protocol: If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [~~1998~~2001 CBC, Section 109, Certificate of Occupancy].

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Table 1** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 1**, above):

1. Major project structures;
2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;
4. Turbine/generator pedestal; and
5. Switchyard structures.

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

Protocol: The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications [~~1998~~2001 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [~~1998~~2001 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents]; and
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [~~1998~~2001 CBC, Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction of any structure or component listed in **Table 1** of Condition of Certification **GEN-2**, above the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the ~~1998~~2001 CBC, Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the ~~1998~~2001 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the ~~1998~~2001 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the ~~1998~~2001 CBC.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of major piping or plumbing construction, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in Table 1, Condition of Certification GEN 2, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [~~1998~~2001 CBC, Section 106.3.2, Submittal Documents, Section 108.3, Inspection Requests, Section 108.4, Approval Required; ~~1998~~2001 California Plumbing Code, Section 103.5.4, Inspection Request, Section 301.1.1, Approval].

Protocol: The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);

- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- Specific City/County code.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [~~1998~~2001 CBC, Section 104.2.2, Deputies].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of major piping or plumbing construction listed in Table 1, Condition of Certification GEN-2 above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [~~1998~~2001 CBC, Section 108.3 – Inspection Requests].

Protocol: The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

Protocol: The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [~~1998~~2001 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC ~~1998~~2001, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [~~1998~~2001 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
2. system grounding drawings.

B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;

2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements; and
7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the Monthly Compliance Report:

1. receipt or delay of major electrical equipment;
2. testing or energization of major electrical equipment; and
3. a signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

California Energy Commission/Commissioners (CEC) 2002b (tn:26635). Commission Decision for Russell City - POS.

RCEC 2006a. Russell City Energy Company, LLC, Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.

GEOLOGY AND PALEONTOLOGY

Testimony of Patrick Pilling, Ph.D., P.E., G.E.

SUMMARY OF CONCLUSIONS

The proposed amendment includes locating the facilities approximately 1,300 feet to the northwest of the original plant site; however, the underlying soils deposits are generally consistent with those mapped at the previous site (Russell City Energy Company, LLC [RCEC], 2007). In addition, the geologic hazards present at the Russell City Energy Center (RCEC) are essentially the same as those present at the previous site and include strong ground shaking, potential liquefaction during an earthquake, potential differential settlement of heavily loaded structures, and expansive clay soils. These potential hazards can be effectively mitigated through facility design as required by the California Building Code (2001) and conditions of certification. No significant geologic resources are present, but paleontological resources have been documented in the general area of the project. The potential impacts to paleontological resources due to construction activities will be mitigated as required by conditions of certification.

Based on this information, it is staff's opinion that the potential for significant adverse cumulative impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the construction, operation, and closure of the proposed project, is low. It is Energy Commission staff's opinion that the RCEC can be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards (LORS), and in a manner that protects environmental quality and assures public health and safety.

INTRODUCTION

In this section, Energy Commission staff discusses potential impacts of the proposed amendment in relation to geologic hazards, geologic (including mineralogic), and paleontologic resources. This analysis covers only those aspects of the RCEC that have changed as a result of the proposed amendment and that affect staff's testimony for geology and paleontology as contained in the Energy Commission Decision (Decision) (CEC, 2002b).

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS)-COMPLIANCE

Since publication of the Decision (CEC, 2002b), there have been no changes in the applicable LORS in relation to geology and paleontology.

SETTING

REGIONAL GEOLOGIC SETTING

The RCEC site is located along the eastern shore of the San Francisco Bay, within the limits of the Coast Ranges Physiographic Province. The San Francisco Bay fills a northwest-trending structural depression in the central Coast Ranges. This portion of the San Francisco Bay is located in a seismo-tectonically active region. Both the previous and proposed sites lie between the San Andreas Fault, which is located approximately 14 miles to the west, and the Hayward Fault, which is located approximately 3 miles to the east.

SITE GEOLOGY

The project site is underlain by unconsolidated soils that were deposited along the San Francisco Bay (Bay). Previous testimony (CEC, 2002a) estimates that young Bay mud is present in the project area to a depth of approximately 20 to 60 feet below existing grade, and is underlain at depth by older, more consolidated Bay mud deposits and ultimately by bedrock of the Franciscan Formation. The young Bay mud was most likely deposited in the last low sea-level stand approximately 11,000 years ago (Atwater et al., 1977). The contact between the old Bay mud and bedrock of the Franciscan Formation is estimated to be approximately 400 feet below the ground surface (Hazelwood, 1976).

Exploration at the previous plant site (RCEC, 2007) encountered approximately 3 feet of clayey sand fill at the ground surface. This fill is generally underlain by silty clay to the depths explored (150 feet), although beds of clayey sand have been reported (RCEC, 2007). The native silty clay soils were classified as moist to wet, soft near the ground surface (young Bay mud) to very stiff at depth (old Bay mud), and as exhibiting 55 to 100 percent low to high plasticity fines. The interbeds of granular soils were classified as very moist to wet, loose to medium dense, and as containing 20 to 40 percent low to high plasticity fines.

Groundwater was encountered at the previous plant site at a depth approximately 6 feet below existing grade in all borings.

No faults are mapped as passing through the subject site.

Based on site geology as described in the amendment (RCEC, 2006), site subsurface conditions and associated geologic hazards are expected to be very similar to those encountered at the previous plant site.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Since the subsurface conditions and associated geologic hazards at the proposed site are expected to be similar to those previously analyzed (RCEC, 2006; RCEC, 2007); potential geologic hazards and the thresholds for significance are essentially the same

as documented in the Decision (CEC, 2002b). In addition, there are no significant geologic resources present in the project area.

The potential to encounter paleontological resources remains. Staff reviewed existing paleontologic information for the surrounding area, as well as site-specific information provided by the project owner (RCECa, 2006), in accordance with accepted assessment protocol (SVP, 1995) to determine if there are any known paleontologic resources in the general area.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The project owner has stated that, in general, the potential for geologic hazards to affect the site remains essentially unchanged, and that there is no potential to affect geologic resources. The project owner does, however, state that there is still the potential to encounter paleontological resources during construction of the project.

Staff's independent evaluation of the site confirms the project owner's position. Therefore, no additional mitigation over and above that already recommended is considered necessary.

Construction Impacts and Mitigation

As noted above, no viable geologic or mineralogic resources are known to exist in the area. Paleontological resources have been documented with 2 miles of the project site, and the native materials exhibit a high sensitivity rating with respect to containing significant paleontologic resources. Since construction of the proposed project will include significant amounts of grading, foundation excavation, and utility trenching, staff considers the probability that paleontological resources will be encountered during such activities to be high when native materials are encountered, based on SVP assessment criteria. Conditions of Certification **PAL-1** to **PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level.

Operation Impacts and Mitigation

The geologic hazards present at the RCEC site are essentially the same as those present at the previous site and include strong ground shaking, potential liquefaction during an earthquake, potential differential settlement of heavily loaded structures, and expansive clay soils. These potential hazards can be effectively mitigated through facility design as required by the California Building Code (2001) and Conditions of Certification **GEO-1** and **GEO-2**.

CUMULATIVE IMPACTS AND MITIGATION

There are no changes to the cumulative impacts section of the Decision caused by the proposed amendment changes. As a result, no additional mitigation is considered necessary.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments on geology and paleontology have been issued for the RCEC project.

CONCLUSIONS

The project owner will likely be able to comply with applicable LORS, provided that the proposed conditions of certification are followed. The project should have no adverse impact with respect to design and construction of the project, and geologic, mineralogic, and paleontologic resources.

As a part of its work, Energy Commission staff also reviewed the information contained in the geotechnical report prepared by Harding ESE (CH2MHILL, 2007a) for the City of Hayward Advanced Water Treatment System located immediately southwest of the project site, as well as the Mt. Eden Annexation environmental impact report (COH 2004). The information contained in these documents does not alter the conclusions reached as outlined in this testimony.

Staff proposes to ensure compliance with applicable LORS through the adoption of the proposed conditions of certification listed below.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

General conditions of certification with respect to Geology are covered under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section. Conditions of Certification **GEO-1** and **GEO-2** require that the project owner assign a certified Engineering Geologist to the project (**GEO-1**), and prepare an engineering geology report (**GEO-2**). Strikeout has been used to indicate deleted language, and underline to indicate new language. These conditions are as follows:

GEO-1 Prior to the start of construction, the project owner shall assign to the project an Engineering Geologist(s), certified by the State of California, to carry out the duties required by the ~~1998~~ 2001 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The Certified Engineering Geologist(s) assigned must be approved by the CPM. The functions of the Engineering Geologist can be performed by a responsible Geotechnical Engineer, if that person has the appropriate California license.

Verification: At least 30 days (or a lesser number of days, mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit to the CPM for approval the names(s), resume(s), and license number(s) of the Certified Engineering Geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM shall notify the project owner of its findings within 15 days of receipt of the submittal. If the Engineering Geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s), resume(s) and license number(s) of the newly assigned Engineering Geologist(s) to the CPM. The CPM will notify the project owner of its findings within 15 days of receipt of the notice of personnel change.

GEO-2 The assigned Engineering Geologist(s) shall carry out the duties required by the 2001 CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1- Final Reports. Those duties are:

1. Prepare the Engineering Geology Report, which shall include a site specific seismic hazards analysis. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
2. Monitor geologic conditions during construction.
3. Prepare the Final Geologic Report.

   Protocol: (I): The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion of the adequacy of the site for the intended use as affected by geologic factors.

   The Final Geologic Report to be completed after completion of Grading, as required by the 2001 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The Engineering Geologist shall submit a statement that, to the best of his/her knowledge, the work within his/her area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of Chapter 33.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO or other, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following the completion of the final grading, the project owner shall submit copies of the Final Geologic Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CBO, with a copy of the transmittal letter forwarded to the CPM.

Paleontological conditions of certification are as follows:

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated Paleontologic Resource Specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated Paleontologic Resource Specialist shall be responsible for implementing all the Paleontologic conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated Paleontologic Resource Specialist.

The statement of qualifications for the designated Paleontologic Resources Specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontologic resource management; and at least three years of paleontologic resource mitigation and field experience in California, including at least on year's experience leading paleontologic resource mitigation and field activities. The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers on contacts familiar with the specialist's work of these referenced projects.

If the CPM determined that the qualifications of the proposed Paleontologic Resource Specialist do not satisfy the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

Verification: At least 90 days prior to the start of construction (or a lesser number of days mutually agreed to by the project owner and the CPM), the project owner shall submit the name and resume and the availability for its designated Paleontologic Resource Specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resource specialist.

At least 10 days prior to the termination or release of a designated Paleontologic Resource Specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated Paleontologic Resource Specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of the project construction, the designated Paleontologic Resource Specialist shall prepare a Paleontologic Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontologic resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated Paleontologic Resource Specialist shall be available to implement the PRMMP, as needed, throughout project construction.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP, 1994) the PRMMP shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation.
- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities.

- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring.
- An explanation that the designated Paleontologic Resource Specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined.
- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits.
- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontologic resources.

Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Verification: At least 60 days prior to the start of construction on the project (or a lesser number of days mutually agreed to by the project owner and the CPM), the project owner shall provide the CPM with a copy of the Monitoring and Mitigation plan prepared by the designated Paleontologic Resource Specialist for review and approval. If the plan is not approved, the project owner, the designated Paleontologic Resource Specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated Paleontologic Resource Specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground-disturbing equipment. The project owner and Construction Manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontologic resources or deposits that may be discovered during project-related disturbance.

Protocol: The Paleontologic training program shall discuss the potential to encounter paleontologic resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontologic resources are encountered during project activities. The training program shall be presented by the designated Paleontologic Resource Specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least 30 days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontologic resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated Paleontologic Resource Specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction. Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports.

PAL-4 The designated Paleontologic Resource Specialist or designee shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trending, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated Paleontologic Resource Specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontologic activities conducted by the designated Paleontologic Resource Specialist.

PAL-5 The project owner, through the designated Paleontologic Resource Specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontologic resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated Paleontologic Resource Specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for delivery of all significant paleontologic resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontologic Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontologic Resources Report by the designated Paleontologic Resource Specialist. The Paleontologic Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontologic report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontologic resources encountered; determinations of sensitivity and significance; and a statement by the Paleontologic Resource Specialist that project impacts to paleontologic resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontologic Resources Report to the CPM for review and approval, under a cover letter stating that it is a confidential document. The report is to be prepared by the designated Paleontologic Resource Specialist within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding potential impact to paleontologic resources by the closure activities. The conditions for closure will be determined when a facility closure plan is submitted to the CPM, twelve months prior to closure of the facility. If no activities are proposed that would potentially impact paleontologic resources, then no mitigation measures for paleontologic resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontologic resources are to be based upon the Paleontologic Resource Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

REFERENCES

Atwater, B.F., Hedel, C.W., and Helley, E.J., 1977, Late Quaternary depositional history, Holocene sea-level changes, and vertical crustal movement, southern San Francisco Bay, California: U.S. Geological Survey Professional Paper 1014, 15p.

CBC (California Building Code). 2001.

California Energy Commission (CEC), 2002a. Final Staff Assessment (FSA) and Addendum, Comments on the FSA, published on June 10, 2002.

California Energy Commission (CEC), 2002b. Commission Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002.

CH2MHILL 2007a – CH2MHILL/D.M. Davy (tn: 38948). Applicant's Responses to Staff Data Requests 1-52. Cover letter docketed, transmittal letter, and attached POS. 01/17/2007. Rec'd 01/17/2007.

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Hazelwood, R.M. 1976. Contour map and interpretive cross sections showing depth and configuration of bedrock surface, South San Francisco Bay Region, California. U.S. Geological Survey Miscellaneous Field Studies Map, MF-796, scale 1:62,500.

Russell City Energy Company, LLC (RCEC), 2006. Amendment No. 1, submitted to the California Energy Commission on November 17, 2006.

Russell City Energy Company, LLC (RCEC), 2007. Supplemental Filing, Response to Data Requests 1 through 52, submitted to the California Energy Commission in January 2007.

SVP (Society of Vertebrate Paleontologists). 1994. Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources: Standard Procedures. October 1994.

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POWER PLANT EFFICIENCY

Testimony of Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The Power Plant Efficiency findings and conclusions incorporated in the original Energy Commission Decision (Decision) remain valid. No laws, ordinances, regulations, and standards (LORS) apply to project efficiency.

INTRODUCTION

This analysis addresses only those aspects of the Russell City Energy Center project (RCEC) that have changed as a result of the proposed amendment. There are no changes due to the proposed amendment that could affect project efficiency. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.)

LAWS, ORDINANCES, REGULATIONS AND STANDARDS - (LORS) — COMPLIANCE

No LORS apply to project efficiency.

SETTING

The project changes proposed in the amendment would not result in any modifications to Power Plant Efficiency as described in the original Decision.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The assessment of impacts and discussion of mitigation in the area of Power Plant Efficiency as described in the Decision have not changed, therefore, the proposed and this amendment does not require any revisions to the original analysis (Energy Commission Decision, p.68-69).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no agency or public comments regarding efficiency.

CONCLUSIONS

The Power Plant Efficiency findings and conclusions incorporated in the original Decision remain valid. No LORS apply to project efficiency.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification apply to power plant efficiency.

REFERENCES

Energy Commission Decision. California Energy Commission Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002

POWER PLANT RELIABILITY

Testimony of Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The Power Plant Reliability findings and conclusions incorporated in the original Energy Commission Decision (Decision) remain valid. No laws, ordinances, regulations, and standards (LORS) apply to project reliability.

INTRODUCTION

This analysis addresses only those aspects of the Russell City Energy Center (RCEC) that have changed as a result of the proposed amendment. There are no changes due to the proposed amendment that could affect project reliability. (See original Commission Decision for the project at www.energy.ca.gov/sitingcases/russellcity/documents/2002-09-12.commissiondecis.PDF.)

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

No LORS apply to project reliability.

SETTING

The project changes proposed in the amendment would not result in any modifications to Power Plant Reliability as described in the original Decision.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The assessment of impacts and discussion of mitigation in the area of Power Plant Reliability as described in the Decision have not changed. Thus, the proposed amendment does not require any revisions to the original analysis (Energy Commission Decision, p.68-69).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received no agency or public comments regarding reliability.

CONCLUSIONS

The Power Plant Reliability findings and conclusions incorporated in the original Decision remain valid. No LORS apply to project reliability.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification apply to power plant reliability.

REFERENCES

Energy Commission Decision. California Energy Commission Decision for the Russell City Energy Center AFC, Alameda County, Published on September 11, 2002.

TRANSMISSION SYSTEM ENGINEERING

Testimony of Ajoy Guha, P. E. and Mark Hesters

SUMMARY OF CONCLUSIONS

The current System Impact studies (SIS) and the Facility study (FS) for the amended project with expected June 10, 2010, commercial operation date indicate that the interconnection of the Russell City Energy Center (RCEC) to the California Independent System Operator (CA ISO) grid would have adverse impacts, with new overloads on the downstream transmission facilities of the Pacific Gas & Electric (PG&E) system. Accommodating the interconnection of the RCEC and its power output would require expansion and reconfiguration of the Eastshore substation 230 kV bus, and reconductoring of the Eastshore-San Mateo 230 kV line and the Eastshore- Dumbarton 115 kV line, and replacing the existing two 230/115 kV transformer banks with 420 MVA banks at the Eastshore substation. These network modification and upgrades planned by PG&E and selected by the petitioner as mitigation measures are considered effective to offset the adverse impacts and would ensure system reliability in accordance with the North American Reliability Council (NERC)/Western Electric Coordinating Council (WECC) & CA ISO planning standards, and are acceptable to staff.

The proposed new interconnection facilities to the CA ISO grid, which include the RCEC 230 kV switchyard and the double circuit 230 kV line to the PG&E Eastshore 230 kV substation bus, are adequate in accordance with good utility practices and acceptable to staff.

For the Eastshore-San Mateo 230 kV line (12.5-mile) and the Eastshore-Dumbarton 115 kV line (7-mile) PG&E reconductoring mitigation projects, general environmental analyses have been provided by the project owner in the amendment petition. Staff's 2002 environmental analysis report for the Eastshore-San Mateo 230 kV line reconductoring project is provided with this staff assessment as Appendix A.

The RCEC project would comply with all applicable Laws, Ordinances, Regulations and Standards (LORS) assuming implementation of the recommended conditions of certification. Staff believes that the RCEC project would essentially supplement the local generation at Contra Costa, Pittsburg and the San Francisco peninsula, reduce power import to the area and enhance the reliability of the local electric grid.

INTRODUCTION

The Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conforms to all applicable (LORS) required for safe and reliable electric power transmission. Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the project owner. Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy

Commission (California Code of Regulations, title 14, §15378). Therefore, the Energy Commission must identify the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are required for interconnection and represent the "whole of the action."

Energy Commission staff rely on the interconnecting authority for the analysis of impacts on the transmission grid as well as the identification and approval of required new or modified facilities downstream from the proposed interconnection required as mitigation measures. The proposed RCEC would interconnect to PG&E transmission network and requires analysis by PG&E and approval of the CA ISO.

PG&E'S ROLE

PG&E is responsible for ensuring electric system reliability in the PG&E system for addition of the proposed generating plant. PG&E will provide the analysis and reports in their System Impact and Facilities studies, and their approval for the facilities and changes required in the PG&E system for addition of the proposed transmission modifications.

CA ISO'S ROLE

The CA ISO is responsible for ensuring electric system reliability for all participating transmission owners and is also responsible for developing the standards necessary to achieve system reliability. The CA ISO will review the studies of the PG&E system to ensure adequacy of the proposed transmission interconnection. The CA ISO will determine the reliability impacts of the proposed transmission modifications on the PG&E transmission system in accordance with all applicable reliability criteria. According to the CA ISO Tariffs, the CA ISO will determine the "Need" for transmission additions or upgrades downstream from the interconnection point to insure reliability of the transmission grid. The CA ISO will, therefore, review the System Impact Study (SIS) performed by PG&E and/or any third party, provide their analysis, conclusions and recommendations, and issue a preliminary approval or concurrence letter to PG&E. On completion of the PG&E Facility Studies, the CA ISO will review the study results, provide their conclusions and recommendations and issue a final approval/disapproval letter for the interconnection of the proposed RCEC. The CA ISO will provide verbal testimony on their findings at the Energy Commission hearings.

Russell City Energy Company, LLC (petitioner/project owner), the project owner, has filed a petition to the California Energy Commission to amend the certification of the RCEC project (01-AFC-7, certified 9-11-02) in order to construct a nominal 600 megawatt (MW) natural gas-fired combined cycle generating facility to be located in the City of Hayward. The amended project is expected to be on-line in June, 2010 (RC 2006a, section 1.1, Pages 1-1 to 1-2. Section 2.4-1, Page 2-16).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) - COMPLIANCE

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for

construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance and operation or use of overhead electric lines and to the public in general.

- California Public Utilities Commission (CPUC) General Order 128 (GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.

- The National Electric Safety Code, 1999 provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.

- NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of the standards, "NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table" and on Section I.D, "NERC and WECC Standards for Voltage support and Reactive Power". These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WECC 2002).

- North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain

aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards for Transmission System Contingency Performance. The NERC Reliability standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).

- CA ISO Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the CA ISO transmission grid facilities. The CA ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the CA ISO Standards also provide some additional requirements that are not found in the WECC/NERC or NERC Standards. The CA ISO Standards apply to all participating transmission owners interconnecting to the CA ISO controlled grid. They also apply when there are any impacts to the CA ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the CA ISO (CA ISO 2002a).
- CA ISO/FERC Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the CA ISO controlled grid. The CA ISO determines the "Need" for the proposed project where it will promote economic efficiency or maintain System Reliability. The CA ISO also determines the Cost Responsibility of the proposed project and provides an Operational Review of all facilities that are to be connected to the CA ISO grid (CA ISO 2003a).

EXISTING FACILITIES AND RELATED SYSTEMS

The existing facilities in the vicinity of the RCEC project area include the following PG&E facilities:

- Eastshore 230/115 kV Substation with two 134/161 MVA 230/115 kV transformer banks.
- Eastshore-Grant double circuit 115 kV line.
- Eastshore-Dumbarton 115 kV line.
- Eastshore-Mt. Eden double circuit 115 kV line.
- Eastshore-San Mateo 230 kV line.
- Pittsburg-Eastshore 230 kV line.
- Pittsburg-San Mateo 230 kV line.

The project owner has proposed interconnection of the RCEC via a new double circuit 230 kV line at the Eastshore Substation, which is about a mile away from the project site and is located in the PG&E network where two major 230 kV bulk power lines and three 115 kV lines directly feed the South Bay and Peninsula load areas. In addition Eastshore Energy has submitted an Application for Certification (AFC, 06-AFC-6) for interconnection of their 115 MW Eastshore peaking plant at Eastshore 115 kV substation bus through a new 1.1 mile 115 kV line, the target on-line date being 2008.

The RCEC and Eastshore generating plants would essentially serve the load centers of the San Francisco south bay area and the peninsula, reduce power import to the area, supplement the local generation at Contra Costa, Pittsburg and the peninsula, and enhance the reliability of the local electric grid.

PROJECT DESCRIPTION

The RCEC revised site will be located about 1.0-mile northwest of the PG&E East shore 230/115 kV Substation in the City of Hayward, Alameda County (CB 2001a, AFC Section 1.1), adjacent to and south of Depot Road and directly west of the City's Water Pollution Control Facility (WPCF). The new location is about 1,300 feet northwest of the original proposed location at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street. The RCEC will consist of two combustion turbine generators (CTG), each with an output of about 180 MW and one steam turbine generator (STG), with a maximum output of 254 MW, for a total nominal plant net output of 600 MW (CB 2001a, AFC, Sections 2 & 6). Each of the CTG units will be connected to the low voltage terminal of a dedicated generation station unit (GSU) 150/200/250 MVA, 13.8/230 kV step-up transformer. The STG unit would be connected to the low voltage terminal of a dedicated GSU 180/240/300 MVA, 18/230 kV step-up transformer (RC 2006a, SISs).

SWITCHYARD AND INTERCONNECTION FACILITIES

The new RCEC 230 kV switchyard is proposed for a configuration of five-breaker 3, 000-ampere ring bus arrangement for building five switch bays. Each breaker will be gas-insulated (GIS) with 3,000-ampere continuous rating and 63 kiloampere (kA) fault interrupting capacity. The high voltage terminals of GSU transformers would be connected by overhead conductors to three switch bays. The remaining two switch bays would be used for the new double circuit 230 kV overhead interconnection line to the East Shore 230 kV Substation. The project owner will build, own and operate the RCEC switchyard (PG&E 2001a, SIS).

The new RCEC 230 kV switchyard would be interconnected to the PG&E East Shore Substation 230 kV bus by building a new double circuit 230 kV line with 795 kcmil steel supported aluminum conductor (SSAC) on 120-feet high tubular steel poles. The length of the line would be either 1.33-miles or 1.21-miles depending on the selection of its alternate route options which are:

1. RCEC switchyard north-Depot Road east-Grant Eastshore corridor route,
2. RCEC switchyard southeast-Road along northern boundary of the City's WPCF-Grant Eastshore corridor route.

The major portion of the new line would run parallel with the existing East Shore-Grant 115 kV line along Enterprise Avenue within PG&E's existing transmission corridor.

To accommodate termination of the interconnecting line at the PG&E East Shore 230 kV Substation and insure reliability of the network, the existing three-breaker single 230 kV bus configuration of the Eastshore substation will be converted to a 3,000-ampere double bus arrangement. The proposed modification in the Eastshore substation would

consist of six 230 kV switch bays, each bay with a breaker and a half arrangement, for a total of nine 2,000-ampere breakers and twenty-four 2,000-ampere disconnect switches. Two switch bays would be used for connection of the two generator tie circuits, two switch bays for connection of the existing Eastshore-San Mateo and Pittsburg-Eastshore 230 kV lines, and two other switch bays for the two 230/115 kV substation transformer banks. The original project connected the existing Pittsburg-San Mateo 230 kV line that now passes through the East shore substation fence line to the East shore substation, as part of the amendment the Pittsburg-San Mateo 230 kV line will no longer be connected to the substation 230 kV bus for interconnection of the RCEC. In order to accommodate the above modifications the existing fence line of the Eastshore substation would be extended on the north and west to the adjacent existing PG&E property. PG&E would build, own and operate the new generator tie line and modified Eastshore substation (CB 2001a, AFC Section 6; RC 2006a, SISs and section 2.3, pages 2-10 & 2-13; CH2MHILL 2007b).

The configuration of the RCEC switchyard, the generator tie line to the modified Eastshore substation and its termination is in accordance with good utility practices and is acceptable to staff.

TRANSMISSION SYSTEM IMPACT ANALYSIS

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility and the control area operator are responsible for insuring grid reliability. For the RCEC, PG&E and CA ISO are responsible for insuring grid reliability. In accordance with FERC/CA ISO/Utility Tariffs, System Impact and Facilities Studies are conducted to determine the preferred and alternate interconnection methods to the grid, the downstream transmission system impacts and the mitigation measures needed to insure system conformance with performance levels required by utility reliability criteria, NERC planning standards, WECC reliability criteria, and CA ISO reliability criteria (CA ISO 2002a and 2003a). Staff relies on the studies and any review conducted by the responsible agencies to determine the effect of the project on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards.

The System Impact and Facilities Studies analyze the grid with and without the proposed project under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which grid reliability is determined. The studies must analyze the impact of the project for the proposed first year of operation and thus are based on a forecast of loads, generation and transmission. Load forecasts are developed by the interconnected utility, which would be PG&E in this case. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), and short circuit duties.

If the studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards, the study will then identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. If the interconnecting utility determines that the only feasible mitigation includes transmission modifications or additions which require CEQA review as part of the "whole of the action," the Energy Commission must analyze these modifications or additions according to CEQA requirements.

SCOPE OF SYSTEM IMPACT STUDY (SIS) AND FACILITY STUDY (FS)

The June 30, 2005 PG&E SIS included a 2007 summer peak and a 2007 summer off peak case to reflect WECC's transmission system, forecasted load and generation. The study was conducted with two CTG units for a net 354 MW RCEC generation output. The December 13, 2005 PG&E SIS included a 2008 summer peak and a summer off peak full loop case. The study was conducted with two CTG units and an additional STG unit for a total net 600 MW generation output from the RCEC plant. Both studies included planned CA ISO system upgrades that would be operational by 2007/2008, and queue generation and transmission projects higher than the RCEC queue. The potential generation scenarios in the San Francisco Bay area were modeled such as the retirement of the Hunters Point and Potrero power plants, and the operation of proposed City and County of San Francisco (CCSF) generating units. The study included a Power Flow analysis, a Transient stability analysis, a Short Circuit analysis and Substation Evaluation. The Power Flow Studies were conducted before and after the addition of the RCEC with a 1-in-10 year extreme weather summer peak load level for the greater bay area and a spring off peak load level for the PG&E system.

The November 2, 2006 PG&E FS determined the work scope and cost estimates for the generation tie line facilities and also necessary downstream network upgrades in the PG&E system assuming PG&E would engineer, construct, own and maintain the interconnecting facilities (except the RCEC switchyard) and engineer and construct the downstream upgrades (RC 2006a, SISs; CH2MILL 2007a, FS).

POWER FLOW STUDY RESULTS AND MITIGATION

The SISs and FS demonstrate that the existing PG&E transmission facilities are inadequate to accommodate interconnection of the RCEC. The addition of the RCEC would have adverse impacts on the PG&E system under 2007/ 2008 summer peak and summer off peak system conditions. In order to maintain system reliability downstream network upgrades would be required to facilitate interconnection of the proposed RCEC to the CA ISO grid. The power flow study results have been tabulated in the study reports (RC 2006a, SISs, Pages 14-16 and Appendix B).

Based on the results of the SIS, under 2007 summer peak normal system conditions there is a new overload identified in the PG&E system on the Eastshore-San Mateo 230 kV line due to the interconnection of the RCEC. Under certain contingencies, and during 2007/2008 summer peak and summer off peak system conditions, the SIS and FS reports identified the following overloads and corresponding mitigation measures (RC 2006a, SISs: CH2MHILL 2007a, FS; CH2MHILL 2007b):

- Eastshore- San Mateo 230 kV line: Besides the new overload identified on this line under 2007 summer peak normal system conditions, new overloads are also found on this line under 2007 summer peak and off peak system conditions for certain CA ISO Category B contingencies. Under 2007 summer peak system conditions, the pre-project overload on this line is substantially exacerbated due to the addition of the RCEC for the outages of the Newark-Ravenswood and Tesla-Ravenswood 230 kV lines. The mitigation measure, PG&E planned project number P02186, is part of the network upgrade needed to interconnect the RCEC to the CA ISO grid. The PG&E project involves reconductoring the 12.5-mile Eastshore-San Mateo 230 kV line with 954 kcmil SSAC conductor and replacing the 650 kcmil copper bus at San Mateo substation with 954 kcmil SSAC. The reconductoring project is expected to be completed by January, 2009. Staff considers the mitigation measures acceptable.

- Eastshore-Dumbarton 115 kV line: Substantial new overloads are identified under 2007 summer peak and off peak system conditions for certain CA ISO Category B and C contingencies. The mitigation measure, PG&E planned project number P02186, is part of the network upgrade needed to interconnect the RCEC to the CA ISO grid. The PG&E project involves reconductoring the 7-mile Eastshore-Dumbarton 115 kV line with 2-477 SSAC conductor and is expected to be completed by December, 2008. Staff considers the mitigation measure acceptable.

- Newark-Dumbarton 115 kV line: Substantial new overloads are found under 2007 summer peak and off peak system conditions for certain CA ISO Category B and C contingencies. However, the overloads on the line had since been eliminated due to completion of reconductoring of the 7-mile line with 795 kcmil SSAC conductor, in accordance with PG&E planned project number P01769, in December 2006.

- Eastshore substation two 230/115 kV transformer banks: New overloads are found on both the existing 134/161 MVA transformer banks due to outages of Eastshore-San Mateo 230 kV line and Metcalf generation plant under 2007 summer peak system conditions. The PG&E maintenance project P01951 would replace one of the transformer banks with a three-phase 420 MVA bank and it is expected to be completed by December, 2007. The PG&E network upgrade project P02186 for interconnection of the RCEC would replace the other transformer bank with a three-phase 420 MVA bank and it is expected to be completed by December 2009. Staff considers the mitigation measures acceptable.

- Sobrante-Morago 115 kV line: The pre-project overloads are exacerbated due to the addition of the RCEC for certain CA ISO Category B & C contingencies under 2008 summer off peak system conditions. The mitigation measures include installation of a Special Protection System (SPS) to reduce overload on the line or manual operational measures to curtail RCEC generation. Staff considers the mitigation measures acceptable.

SHORT CIRCUIT STUDY RESULTS AND SUBSTATION EVALUATION

The Short Circuit Study results identified that fault currents at the selected substations electrically adjacent to the project in the PG&E system would increase by 1 to 15

percent from the pre-project case due to the addition of the RCEC. The study data is used to determine if any equipment would be overstressed by the addition of the RCEC.

The Substation Evaluation (SE) determined that the existing 230 kV bus at the Eastshore substation can be extended to facilitate interconnection of the RCEC and will be reconfigured to a new breaker and a half scheme. From the short circuit study data the SE identified two 230 kV circuit breakers at the Pittsburg substation which are further overstressed due to interconnection of the RCEC. However, according to PG&E the RCEC project is not responsible for replacement of these overstressed breakers using current PG&E guideline for breaker replacement where the added stress due to the project should be at least 5 percent and above. The evaluation further determined that the protection requirements for the project would require fully redundant, double-pilot current differential scheme utilizing dual fiber optic communications on the RCEC generator tie line and protective relay replacement at the San Mateo and Pittsburg substations.

Staff concurs with the evaluation and mitigation (RC 2006a, SIS, Pages 17-18 and 21).

TRANSIENT STABILITY STUDY RESULTS

The study identified no transient stability concerns in the PG&E system following selected disturbances for integration of the RCEC. Staff concurs with the study results (RC 2006a, SIS).

CA ISO REVIEW

The CA ISO originally issued their preliminary approval letter of September 10, 2001, for interconnection of the 600 MW RCEC plant to the CA ISO grid at the PG&E Eastshore substation based on the SIS performed by PG&E under 2004 system conditions for the expected second quarter of 2004 commercial operation date. Based on the results of the November 2, 2006 PG&E FS study for the expected June, 2010 commercial operation date, the CA ISO issued their final approval letter of November 7, 2006 to interconnect the 600 MW RCEC project to the CA ISO grid. The CA ISO's final approval ensures system reliability in the CA ISO grid and as such compliance with WECC/NERC and CA ISO Planning standards (CA ISO 2001a; CA ISO 2006a).

DOWNSTREAM FACILITIES

Besides the interconnection facilities which include the new RCEC switchyard and the proposed new double circuit 230 kV line between the RCEC 230 kV switchyard and the Eastshore 230/115 kV substation, accommodating the interconnection of the RCEC and its power output would require expansion and reconfiguration of the Eastshore substation 230 kV bus, and reconductoring of the Eastshore-San Mateo 230 kV line and the Eastshore- Dumbarton 115 kV line, and replacing the existing two 230/115 kV transformer banks with 420 MVA banks at the Eastshore substation. The existing fence line of the Eastshore substation would be extended within the adjacent existing PG&E property to accommodate expansion of the substation 230 kV bus and transmission outlets.

CUMULATIVE IMPACTS

In view of the concentration of electrical generation and several new and proposed power plants in the greater San Francisco Bay area, staff believes that the RCEC generation and Eastshore peaking plant will have some cumulative effects on the local 230 kV and 115 kV voltage network. Reconductoring of the Eastshore-San Mateo 230 kV line would result in local system effects in that it would provide greater flexibility in routing power in San Francisco south bay area and peninsula. Staff has provided a discussion on the cumulative transmission impacts for this project in Appendix A attached to this document.

The cumulative marginal impacts due to the RCEC, as identified in the SIS, will be mitigated. Staff also believes that there would be some positive impacts because the RCEC would provide additional reactive power and voltage support in the local network and reduce system losses in the PG&E system.

ALTERNATIVE TRANSMISSION ROUTES

For shifting the location of the RCEC plant site according to the amendment petition, the 230 kV generation tie line route between the RCEC switchyard and the Grant-Eastshore transmission corridor has changed, and for this length of the line (varying from 230 feet to 950 feet) two alternate routes have been considered. The major portion of the generation tie line would run parallel with the existing Eastshore-Grant 115kV line along Enterprise Avenue, within the existing PG&E transmission corridor. The project owner is seeking approval for both the alternate line route options. The preferred route option would be selected by PG&E based on availability of right-of-way (RCEC 2006a, Section 2.3, pages 2-10 & 2-13).

CONFORMANCE WITH LORS AND CEQA REVIEW

The SIS demonstrates that there would be adverse impacts in the PG&E system for the addition of the RCEC to the Eastshore substation. But the appropriate mitigation measures including network upgrades for reconductoring two transmission lines as planned would eliminate the adverse impacts. The interconnection, therefore, would conform to the NERC/WECC & CA ISO planning standards and PG&E reliability criteria.

The proposed new interconnecting facilities, the RCEC 230 kV switchyard, and the double circuit 230 kV line to the Eastshore substation including its modification, would be built according to the NESC standards and GO-95 Rules. The new facilities would be in accordance with good utility practices, would conform to engineering LORS and are acceptable to staff.

For the Eastshore-San Mateo 230 kV line (12.5-mile) and the Eastshore-Dumbarton 115 kV line (seven-mile) PG&E reconductoring projects, recent environmental analyses have been provided by the project owner in the amendment petition. Energy Commission staff is preparing a general CEQA analysis for reconductoring of the seven-mile Eastshore-Dumburton 115 kV line. After reviewing the project owner's environmental assessment, staff prepared a report in 2002 for the potential

environmental impacts of reconductoring the Eastshore-San Mateo 230 kV line as Appendix A to the final staff assessment during the certification process for the RCEC. The existing 230/115 kV transformer banks at the Eastshore substation would be replaced within the fenceline of the existing substation and would not require any CEQA review.

The RCEC would, therefore, meet the requirements and standards of all applicable LORS on satisfactory compliance of the conditions of certification (CEC 2002a; RC 2006a, section 2.3.3, pages 2-13 to 2-15).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No agency or public comments related to the TSE discipline have been received.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. In accordance with the amendment petition, the proposed interconnecting facilities including the RCEC 230 kV switchyard, the double circuit 230 kV line to the Eastshore substation and its terminations are adequate in accordance with good utility practices and acceptable to staff according to engineering LORS.

2. The current SIS and FS demonstrate that the addition of the RCEC would have more adverse impacts on the PG&E transmission facilities under 2007/2008 summer peak and off-peak system conditions compared to the original plan for 2004 on-line date. New overloads are identified on several downstream facilities under normal and emergency system conditions. Accommodating the interconnection of the RCEC and its power output would require expansion and reconfiguration of the Eastshore substation 230 kV bus, and reconductoring of the Eastshore-San Mateo 230 kV line and the Eastshore-Dumbarton 115 kV line, and replacing the existing two 230/115 kV transformer banks with 420 MVA banks at the Eastshore substation. These network modification and upgrades planned by PG&E and selected by the project owner as mitigation measures are considered effective in eliminating the adverse impacts of the project and ensuring system reliability, and are acceptable to staff. The interconnection of the RCEC, therefore, would comply with the reliability LORS.

3. Based on the results of current PG&E FS study, the CA ISO issued their November 7, 2006 final approval letter for interconnection of the RCEC to the CA ISO grid based on the expected June 10, 2010 commercial operation date. The CA ISO's final interconnection approval to the RCEC also ensures system reliability and compliance with the WECC/NERC and CA ISO planning standards.

4. For the Eastshore-San Mateo 230 kV line (12.5-mile) and the Eastshore-Dumbarton 115 kV line (seven-mile) PG&E reconductoring mitigation projects, recent environmental analyses have been provided by the project owner in the amendment petition. Staff's 2002 potential environmental impact analysis report for the

Eastshore-San Mateo 230 kV line reconductoring project is provided with this staff assessment as Appendix A.

5. The RCEC would, therefore, conform to the applicable LORS on satisfactory compliance of the recommended conditions of certification.

6. The RCEC would essentially serve the load centers of the San Francisco south bay area and the peninsula, reduce power import to the area, supplement the local generation at Contra Costa, Pittsburg and the peninsula, and enhance the reliability of the local electric grid. Staff believes the RCEC would also provide additional reactive power supply, voltage stability and reduce PG&E system losses.

RECOMMENDATIONS

If the Commission approves the amendment petition for the project, staff recommends the following conditions of certification to ensure system reliability and conformance with LORS.

AMENDED AND PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification below are the original conditions contained in the Decision, proposed new conditions, or modifications to existing conditions that staff has identified as a result of project changes proposed by the project owner as part of Petition to Amend submitted to the Energy Commission on November 17, 2006. Strikeout is used to indicate deleted language and underline for new language.

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors

Disconnects and Wave-traps
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Insulators and Conductors
Grounding System

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq., require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action. (1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

a) receipt or delay of major electrical equipment;

b) testing or energization of major electrical equipment; and

c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations to the CBO as determined by the CBO.

a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", CA ISO standards, National Electric Code (NEC) and related industry standards.

b) Breakers and busses in the power plan switchyard and other switchyards, where applicable, shall be sized to accommodate full output from the project and to comply with a short-circuit analysis.

c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

d) The project conductors shall be sized to accommodate the full output from the project.

e) Termination facilities shall comply with applicable PG&E interconnection standards.

f) The project owner shall provide to the CPM:

1. A line route drawing after selecting one of the alternate route options for the generator interconnection 230 kV tie line.

~~1~~2. The ~~final Detailed Facility Study (DFS) from PG&E with the final selected mitigation plan for resolving identified reliability criteria violations including a description of facility upgrades,~~ operational mitigation measures, ~~and/or Remedial Action Scheme (RAS)~~ and/or Special Protection System (SPS) sequencing and timing if applicable,

~~2~~3. The Executed ~~Facility Interconnection Agreement~~ project owner and CA ISO Large Generator Interconnection Agreement.

~~3. Verification of CA ISO Notice of Synchronization.~~

4. A letter stating that the mitigation measures or projects selected by PG&E for each criteria violation are acceptable,

5. The operational study report from the CA ISO and/or PG&E,

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agree to by the project owner and CBO, the project owner shall submit to the CBO for approval:

a) Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.

b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation

method(s), a sample calculation based on "worst case conditions"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", NEC, applicable interconnection standards, and related industry standards.

c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.

~~d) The Facilities Study and signed letter from the Applicant stating that mitigation is acceptable shall be provided concurrently to the CPM and CBO. Substitution of equipment and Substation configurations shall be identified and justified by the project owner for CBO approval.~~

d) A line route drawing after selecting one of the alternate route options for the generator 230 kV interconnection tie line.

e) The operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to the CPM.

f) The executed project owner and CA ISO Large Generator Interconnection Agreement.

g) A letter stating that the mitigation measures or projects selected by PG&E for each criteria violation are acceptable.

h) The operational study report from the CA ISO and/or PG&E.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to requirements of **TSE-5** and request approval to implement such changes.

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (CA ISO) prior to synchronizing the facility with the California Transmission system:

[1] Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

1. At least one week prior to synchronizing the facility with the grid for testing, provide the CA ISO a letter stating the proposed date of synchronization; and
2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the CA ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the CA ISO letter to the CPM when it is sent to the CA ISO one week prior to initial synchronization with the grid. The project owner shall contact the CA ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the CA ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

a) "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.

b) An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

REFERENCES

CA ISO (California Independent System Operator) 1998a. CA ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

CA ISO (California Independent System Operator) 1998b. CA ISO Dispatch Protocol posted April 1998.

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CA ISO (California Independent System Operator) 2006a. Letter of Final Approval dated 11-07-06 and comments on the Facility study for the RCEC. Submitted 11-17-06.

CB (Calpine-Bechtel) 2001a. Application For Certification for the Russell City Energy Center (01-AFC-7). Submitted to the Energy Commission on May 22, 2001.

CEC (California Energy Commission) 2002a. Final Staff Assessment for the RCEC.

CEC (California Energy Commission) 2002b. Commission Decision for the RCEC

CEC (California Energy Commission) 2006a. RCEC Amendment Data Requests. 12-22-06

RC (Russell City/M. Hartfield) 2006a. Petition for Amendment no.1, Russell City Energy Center, PG&E System Impact Study (SIS) reports dated June 30 & December 13, 2006. Submitted to the California Energy Commission on November 17, 2006.

CH2MHILL (CH2MHILL/D. M. Davy) 2007a. Project owners Responses to Staff Data Requests 1-52, PG&E Facility RE-study (FS) Report dated 11-02-06. Received 01-17-07.

CH2MHILL (CH2MHILL/D. M. Davy) 2007b.Responses from PG&E to follow up transmission questions. Received 02-05-07.

NERC (North American Electric Reliability Council) 2006. Reliability Standards for the Bulk Electric Systems of North America, May 2 2006.

WECC (Western Electricity Coordinating Council) 2002. NERC/WECC Planning Standards, August 2002.

DEFINITION OF TERMS

ACSR - Aluminum cable steel reinforced.

AAC - All Aluminum conductor.

Ampacity - Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.

Ampere - The unit of current flowing in a conductor.

Kiloampere - (kA) 1,000 Amperes

Bundled - Two wires, 18 inches apart.

Bus - Conductors that serve as a common connection for two or more circuits.

Conductor - The part of the transmission line (the wire) that carries the current.

Congestion Management - Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) would not violate criteria.

Emergency Overload - See Single Contingency. This is also called an L-1.

Kcmil or KCM - Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV) - A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground. 1,000 Volts.

Loop - An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar - One megavolt ampere reactive.

Megavars - Megavolt Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA) - A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW) - A unit of power equivalent to 1,341 horsepower**.**

Normal Operation/ Normal Overload - When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition - See Single Contingency**.**

Outlet - Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow Analysis - A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power - Reactive power is generally associated with the reactive nature of inductive loads like motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial Action Scheme (RAS) - A remedial action scheme is an automatic control provision, which, for instance, would trip a selected generating unit upon a circuit overload.

SSAC - Steel Supported Aluminum Conductor.

SF6 - Sulfur hexafluoride is an insulating medium**.**

Single Contingency - Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable - Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard - A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating - See ampacity.

TSE - Transmission System Engineering**.**

TRV - Transient Recovery Voltage

Tap - A transmission configuration creating an interconnection through a sort single circuit to a small or medium sized load or a generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing - A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild - A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

RECONDUCTORING

Testimony of Stanley Yeh

APPENDIX TO TRANSMISSION SYSTEM ENGINEERING EASTSHORE-DUMBARTON 115-KV LINE RECONDUCTORING ENVIRONMENTAL IMPACT ANALYSIS

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1 INTRODUCTION

California Energy Commission (Energy Commission) staff has prepared this appendix to the **Transmission System Engineering** section of the Staff Assessment for the Russell City Energy Center (RCEC) Amendment. The purpose of this analysis is to examine the potential indirect impacts associated with future reconductoring of a transmission line affected by the project.

The System Impact Study and the Facilities Study performed by PG&E and reviewed and approved by the California Independent System Operator (CA ISO) determined that the transmission system beyond the RCEC's first point of interconnection (i.e., "downstream") will require upgrading. PG&E's studies indicated that it will need to reconductor the Eastshore-Dumbarton 115 kV line to eliminate transmission system impacts identified as contingency thermal overloads. These overload conditions are expected to occur after the interconnection and addition of the RCEC generation capacity at the Eastshore Substation. Staff concurrs with the System Impact Study and Facilities Study conclusions and considers the reconductoring acceptable and a reasonably foreseeable action that will result from interconnecting the RCEC facility. Staff has analyzed the potential effects of reconductoring as it may pertain to the RCEC because the California Environmental Quality Act (CEQA) requires an examination of likely subsequent projects that result from the primary project. Reconductoring will be a separate project with a different applicant (i.e., PG&E) before a different agency (i.e., the California Public Utilities Commission) and will be subject to that agency's CEQA review. A more general level of analysis is thus appropriate for this Staff Assessment.

Reconductoring involves replacing the existing lower capacity overhead conductors on one or more transmission line segments with new higher capacity conductors that, because of improvements in the metallurgy of the conductors, allow a large increase in the current-carrying capacity of the segment, without increasing the weight or size of the cable. Reconductoring also may involve replacing terminations at both ends of the substations or even modifying or replacing one or more of the transmission line towers because the new conductors have different sag characteristics, which may require raising the height of certain towers.

The purpose of the Energy Commission's reconductoring analysis is to inform the Energy Commission, interested parties, and the general public of the potential indirect environmental and public health effects that approval of the RCEC may cause. This analysis examines the nature and scope of the probable impacts of reconductoring, and presents measures for mitigating these impacts to a less-than-significant level.

This analysis is based upon information supplied by the RCEC project owner, as well as on information gathered from PG&E and other sources. It describes the process of reconductoring and the types of environmental impacts that might occur as a result of reconductoring. It also discusses specific aspects of the reconductoring project, such as its location and some likely places for pull and tensioning sites and staging yards.

Finally, this analysis concludes that the reconductoring could be accomplished with no significant environmental impacts and identifies mitigation measures that could be enacted if necessary to ensure the reconductoring project would not cause significant impacts.

Several technical areas normally studied in a Staff Assessment have been excluded from this analysis because the potential for impacts in those areas are essentially non-existent. Those areas include Air Quality, Facility Design, Hazardous Materials Management, Power Plant Efficiency, Power Plant Reliability, Worker Safety, Socioeconomic Resources, and Waste Management. Any impacts to those areas would be similar to, but likely less severe than, those related to construction of the project and its associated linear facilities. The construction-related analysis and proposed mitigation measures in those sections of the Staff Assessment for the RCEC provide a general understanding of the potential impacts a reconductoring project could possibly, but not likely, cause in those areas.

2 CONCEPTUAL DESIGN OF RECONDUCTORING

This section identifies the specific transmission line segments that will or most likely will be reconductored as a result of licensing the RCEC. It also reviews the reconductoring process on a general level, describing the basic work involved in reconductoring a transmission line segment, as well as specific designs (when known) for the reconductoring project.

2.1 DESCRIPTION OF THE PROPOSED PROJECT

The construction and operation of the RCEC would trigger the need to reconductor the seven-mile Eastshore to Dumbarton 115-kV transmission line (Eastshore-Dumbarton line). As shown in **RECONDUCTORING FIGURE 1**, this line extends south-southeast from the Eastshore substation in Hayward, Alameda County, across the salt ponds and farther south through open space and agricultural lands west of Hayward, Union City, and Fremont to the Dumbarton substation in Fremont, Alameda County.

The PG&E planned reconductoring project number P02186 for the line involves replacing the existing one-mile, 715-kcmil aluminum conductor and the six-mile bundled 3/0 (2-3/0) kcmil copper conductor with a bundled 477 (2-477) kcmil SSAC (steel supported aluminum conductor). Reconductoring activity is expected to be completed by December 2008.

The Eastshore-Dumbarton line includes a total of 46 existing towers. PG&E has not indicated that any towers would require replacement for the reconductoring. Some additional work may be required on the concrete foundations for one or more of the towers. The need for foundation work would be determined during inspections conducted by PG&E as part of forming the engineering plans for the reconductoring project. Foundation work could range from patching minor cracks in the concrete, to complete replacement of the foundation, which would require excavation work around the base of the tower. PG&E has concluded that for the vast majority of reconductoring projects, however, excavation work near the towers would not be needed.

The project would also cross habitat for the clapper rail and other nesting birds. Because nesting season must be avoided, PG&E has decided that construction in sensitive habitats would take place from September through January.

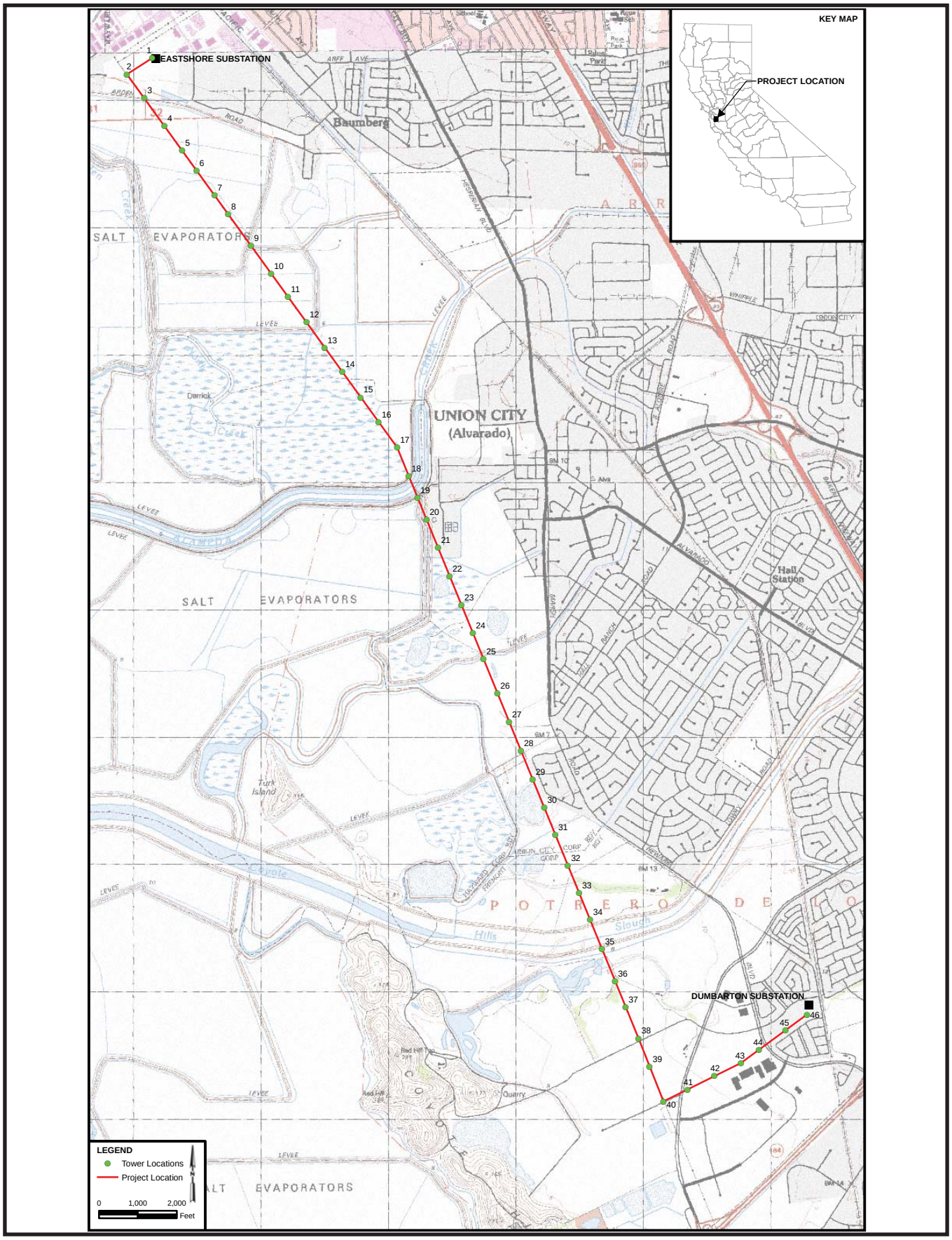
2.2 CONSTRUCTION METHODS

Reconductoring is accomplished by disconnecting the old line and using it like a rope to pull the new line through temporary pulleys, called “travelers” or “sheave blocks,” that are mounted on each tower, until it reaches the other end. Workers access each tower by truck-mounted aerial buckets, or by helicopter for placing the temporary pulleys on each tower and routing the conductors or cables through them. The PG&E and RCEC biologists noted that several towers are located in pickle weed marsh that may have sensitive habitat for the salt marsh harvest mouse or in potentially jurisdictional wetlands.

PG&E determined that construction by helicopter will avoid impacts to these resources in the area of towers 22, 24, 29 through 31. If the old line is not in good enough condition to be used to pull in the new line, it would be used to pull a carrier cable, or “sock line,” through the pulleys to the end of the segment to be replaced; the sock line would then be used to pull the new conductors.

APPENDIX B - FIGURE 1

Russell City Energy Center Amendment # 1 - Eastshore - Dumbarton Line



CALIFORNIA ENERGY COMMISSION - ENERGY FACILITIES SITING DIVISION, JUNE 2007

SOURCE: Attachment DR20-1 Biological Assessment

The reconductoring work involves setting up two work crews on either end of the segment that is being replaced. Each crew generally consists of staff working from two large tractor/trailer units, which either feed out the new line or wind in the old line on spools mounted on the trailers. A typical crew has two or three utility trucks carrying tools and other materials, and 6 or 7 trucks transporting workers, for a total of 8 to 10 trucks and about 20 workers. One crew sets up at a "pull site" near a tower at one end of the pull, and the other at a "tensioning site" near a tower at the other end of the pull. The tensioning crew employs a special tensioner truck, which is essentially a large drum winch that is used to put back tension on the line being pulled. Each pull generally is limited to about two to three miles, and the crews generally pull three conductors (one three-phased circuit) at once.

The tensioning site crew either climbs or uses a truck-mounted aerial bucket (also called a "cherry-picker") to access the tower, disconnect the old conductors, and attach them through the tensioner truck to the new conductor on spools on the large trucks. The pull site crew also climbs the tower and disconnects the lines, then attaches them to the spools in the large trucks below the tower. During this time, other crews set up temporary structures across roads and other potentially inhabited areas to protect those areas in the unlikely event that a conductor breaks and the line falls to the ground.

Once all protective structures are in place and the pull and tensioning sites are ready, the pull crew begins to carefully wind in the old lines onto the spools on the trucks, thus pulling the new lines through the pulleys on the towers along the segment being replaced. Meanwhile, the tensioning crew keeps the lines taut, preventing them from sagging to the ground or onto objects in the right-of-way. Once the new lines are in place, the crews once again access each tower, disconnect the new lines from the pulleys and install them in permanent insulator clamps.

The crews usually pull the new conductors through two or more miles of transmission towers at a time. The potential for environmental impact is generally very low <u>between</u> the pull and tensioning sites, with activities generally restricted to 1) accessing the towers (either by climbing or using a truck-mounted aerial bucket) to place the pulleys and to remove the conductor from the pulleys and refasten it once stringing is completed and 2) work on the tower structure itself to repair or replace damaged spars or to replace insulators.

Though determining now precisely where the pull and tensioning sites would be located is not possible, they are generally sited at "angle" towers, which are located where the line makes a change in direction of more than 10 degrees. Pulling the old lines and reeling out the new conductors is easier at these locations because the pulling and tensioning equipment can be arranged in parallel with the transmission line. Conversely, the crews try to avoid pulling the line through one or more angle towers because the conductors cannot be efficiently pulled through such an angle. Pulling and tensioning can also take place at "dead-end" sites, which are towers where the transmission line is physically connected to the tower, rather than merely passing through the insulator clamps. Generally, one spool of cable is spliced to the next spool at a dead-end site. Dead-end sites are typically located at angle towers, but also can be located at towers that are in line with the route, rather than at an angle to the route. Dead-end towers have significant structural strength and resist the forces of pulling.

The exact locations from which the crews would work will not be known until PG&E draws up final engineering plans for the reconductoring project. The work crews likely would have a great deal of flexibility in choosing the locations of the pull and tension sites, as it may be possible to pull through the angles on some of the towers with a less than 30-degree angle. Because of the flexibility in locating work sites, crews can generally select sites that either avoid creating impacts altogether, or create less-than-significant impacts with certain mitigation measures (e.g., avoiding activity in biologically sensitive areas) enacted.

Also during the reconductoring process, the work crews may replace the insulators on all 46 transmission towers on the line. This work usually involves accessing the tower with a truck-mounted aerial bucket or, by climbing, removing the old insulator strings and installing new ones. The new insulators would be delivered and held in place by the aerial bucket and/or rigging attached to the tower or by helicopter for towers inaccessible by truck. The towers would also be inspected for corrosion prior to reconductoring and, if necessary, repaired. Repairs could include corrosion removal by mechanical means, regalvanizing, and repainting.

Throughout the reconductoring project, temporary staging areas would be required for equipment and materials storage. The locations of the temporary staging areas are presently unknown.

3 RECONDUCTORING IMPACTS

3.1 BIOLOGICAL RESOURCES

Introduction

PG&E conducted a field reconnaissance of the tower locations and access routes to identify sensitive habitat areas and evaluate access to the tower locations for the reconductoring project. Potential impacts to biological resources could occur near the construction work sites that would be established for the reconductoring, including the pull and tensioning sites used to pull the new conductors onto the towers, the locations of any tower that may require modification as part of the reconductoring, and the potential sites for staging or marshalling yards. This analysis focuses on the potential impacts to these work sites and discusses potential mitigation measures that would avoid, eliminate, reduce to a less-than-significant level, or compensate for those potential impacts.

Impacts of Reconductoring

The transmission line will extend seven miles from the Eastshore substation across the salt ponds and farther south through open space and agricultural lands west of Hayward, Union City, and Fremont, to the Dumbarton substation.

Primary concerns associated with reconductoring the transmission line are the potential impacts construction activities necessary to reconductoring could cause to sensitive species and habitats in and adjacent to the transmission line corridor. **Table 1** provides

a list of sensitive species that occur or have potential to occur within or near the transmission line corridor.

Table 1
Sensitive Species Near the East Shore-Dumbarton Line

Common Name	Scientific Name	Federal/State/CNPS Status*
Monarch Butterfly	Danaus plexippus	None
Vernal pool fairy shrimp	Branchinecta lynchi	FT
Vernal pool tadpole shrimp	*Lepidurus packardi*	FE
California red-legged frog	*Rana aurora draytonii*	FT
California tiger salamander	*Ambystoma californiense*	FT
California clapper rail	Rallus longirostris obsoletus	FE
Northern harrier	*Circus cyaneus*	CFP
Saltmarsh common yellowthroat	*Geothlypis trichas sinuosa*	CSC
Tri-color blackbird	*Agelaius tricolor*	CSC
Western snowy plover	*Charadrius alexandrinus nivosus*	FT
White-tailed kite	*Elanus leucurus*	CFP
Saltmarsh harvest mouse	*Reithrodontomys raviventris*	FE
Congdon's tarplant	*Centromadia parryi ssp. Congdonii*	1B
Fragrant fritillary	*Fritillaria liliacea*	1B

Source: CH2M HILL Technical Memorandum, Biological Assessment, Eastshore to Dumbarton Reconductoring, June 13, 2006.

* FE=Federal listed endangered, FT= Federal listed threatened, CSC=California species of concern, CFP= California fully protected species, 1B = California Native Plant Society rare, threatened, or endangered plant species.

The PG&E and RCEC biologists noted that several towers are located in pickle weed marsh that may be sensitive species habitat for the salt marsh harvest mouse or in potentially jurisdictional wetlands. PG&E determined that construction by helicopter would avoid impacts to the key biological resources in these areas (towers 22, 23, 24, 29, 30, and 31).

PG&E also identified four locations where distribution lines passing underneath the Eastshore-Dumbarton 115-kV transmission line could pose a potential safety issue when the transmission line is being pulled during the reconductoring. PG&E determined that the distribution lines could be taken out of service during the pulls, eliminating the need to construct temporary crossing structures at the three locations among the four that could affect wetlands (near towers 17, 22, and 24).

The reconductoring project would also cross habitat for the clapper rail and other nesting birds. To avoid the nesting season, PG&E determined that construction in sensitive habitats would only take place from September through January.

Mitigation

PG&E has indicated that it intends to use helicopter-assisted construction for the reconductoring project as much as possible and that, in this way, it will avoid impacts to wetlands or sensitive species that may be located near the tower bases. Due to the potential for special-status species to occur in several areas along the project, PG&E's biologists have recommended implementation of the following general mitigation measures to minimize adverse affects to both habitat and species during construction:

- Where project activities would occur within or in close proximity to California clapper rail habitat, PG&E would avoid working during the species' breeding season, February 1 to August 31.

- In other sensitive habitats including salt evaporation ponds, a qualified biologist should complete preconstruction surveys to determine if any active nests or sensitive species would be present that may be affected by the project. Seasonal restrictions, limited work periods, monitoring, and other mitigation measures may be required if active nests are identified.
- The owner would provide worker environmental awareness training to field crews. Training should include a discussion of the special-status species and sensitive habitats in the project area and clearly defined avoidance and mitigation measures.
- A biological monitor should be on site when work occurs on the ground in or immediately adjacent to any sensitive habitats.
- If the final design includes a suspended ground wire above the primary conductors, the owner should consider installation of bird flight diverters. This would reduce the potential for mortalities associated with bird collisions along this relatively small diameter line during low visibility conditions.
- PG&E would implement best management practices to prevent erosion and other impacts to water quality. Such practices may include working when soils are dry, installation of silt fences, and/or the use of straw wattles when working adjacent to wetland areas.

However, before work could begin on reconductoring the Eastshore-Dumbarton line, the CPUC would conduct its own environmental review of the reconductoring project and would mandate implementation of mitigation measures for any identified potentially significant impacts. The CPUC routinely mandates standard construction mitigation measures, such as the use of best management practices (BMPs) for construction activities on all reconductoring projects it approves. The Energy Commission staff has concluded that it is likely that the identified reconductoring project could be accomplished without creating a significant impact to biological resources assuming:

- implementation of the CPUC standard construction mitigation measures and
- implementation of those measures that address potential impacts specific to the RCEC, such as the need to compensate for any habitat disturbance or take (i.e., relocation, accidental injury or death) of sensitive species caused by transmission tower foundation work.

Before mitigation can be proposed, however, the project and its potential impacts must be clearly defined, including exact identification of work site locations. PG&E and Calpine have provided general descriptions of the requirements for reconductoring, but no formal work plan has been developed.

Conclusion

Because it appears some of the reconductoring work would occur in or near sensitive species and/or habitats, staff concludes that reconductoring the Eastshore to Dumbarton 115-kV transmission line could adversely impact sensitive biological resources in and/or adjacent to the transmission line corridor. Potential impacts include construction noise effects on nesting activities and the physical effects of construction activity on wetlands.

Without a complete description of requirements for the reconductoring process and specific locations where that work would be conducted (project description), a complete analysis of potential adverse impacts to biological resources is not possible. Staff understands that after construction plans are finalized, a complete project description would be submitted to the CPUC, including wetland delineations, results of all sensitive species surveys, and an updated, revised assessment of potential impacts. Activities associated with reconductoring the transmission line would require compliance with applicable federal, state, and local laws, ordinances, and regulations, including: Federal and State Endangered Species Acts, Federal Migratory Bird Treaty Act, and Federal and State Clean Water Acts. Specific agency permits might be required before any reconductoring work could commence. To determine which permits may be applicable to reconductoring the transmission line, staff recommends that the CPUC consult with the following agencies: California Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Army Corp of Engineers, the Regional Water Quality Control Board, and the Bay Conservation and Development Commission.

Therefore, if the reconductoring work complies with all applicable LORS and if the PG&E implements proposed mitigation measures, and employs standard best management practices for construction activities, the reconductoring of the Eastshore-Dumbarton line likely would not create significant impacts to biological resources.

3.2 CULTURAL RESOURCES

Introduction

The owner is proposing to reconductor the East Shore to Dumbarton 115-kV transmission line. The line will extend approximately seven miles from the Eastshore substation across the salt ponds and farther south through open space and agricultural lands west of Hayward, Union City, and Fremont, to the Dumbarton substation. The project owner has not researched the sensitivity for both historic and historic archaeological resources along the Eastshore-Dumbarton route.

The Dumbarton substation would need evaluation to determine whether it is eligible to be listed as an historic resource, given that it may be more than 45 years old or may be exceptional in nature. The potential for encountering Native American artifacts makes it necessary to contact the Native American Heritage Commission (NAHC) for determining whether any Native American sacred sites exist near the project and to obtain a list of concerned Native Americans in the area.

To obtain a baseline of known archaeological sites, PG&E must contact the California Historical Resources Information System regarding previous archaeological surveys or discoveries in the project vicinity. PG&E must also survey laydown areas or areas where reconductoring would cause ground disturbance to identify potential archaeological site locations.

Since the Eastshore-Dumbarton transmission line exists now, impacts to historical buildings and structures along the route would not be likely. However, PG&E will also need to evaluate whether the transmission line itself is a known or potential historic

resource that, and if so, whether reconductoring would have a potentially significant impact.

Impacts of Reconductoring

Ground disturbance, the presence of vehicles driving over the top of sites, and the installation of new towers could damage archaeological resources. After the archaeological and historic surveys are complete and after the work area is defined, additional archaeological sites or historic resources within the built environment may be identified. If the Eastshore-Dumbarton line is determined eligible for the National Register of Historical Places (NRHP) or the California Register of Historical Resources (CRHR), the reconductoring effort would result in an impact to historical resources. If the line is an eligible resource, PG&E would need to commission an evaluation for determining the significance of the impact. Depending on why the line is eligible, the impact could be less than significant.

Mitigation

Staff recommends that archaeological sites, if any, be evaluated for eligibility for listing in the NRHP or CRHR after the reconductoring construction area has been identified and after the cultural resources surveys are completed. If avoiding impacts to archaeological sites eligible for NRHP or CRHR listing does not appear possible, staff recommends conducting data recovery as a mitigation measure. Monitoring of project-related excavation within an archaeological site is not appropriate mitigation and may destroy the site.

Recordation, which includes documentation of the line with a historic narrative, and photographs or architectural drawings provided on the appropriate California Department of Parks and Recreation forms is an option appropriate for reconductoring activity. It may serve as mitigation for impacts if the line is recommended as eligible for the NRHP or CRHR.

Conclusion

The proposed reconductoring route may be sensitive for cultural resources. If responses are identified, reconductoring could affect them. However, it will be possible to mitigate all impacts to cultural resources to a less-than-significant level by, avoiding known sensitive areas and monitoring construction activities, as described above, or by other appropriate mitigation.

3.3 LAND USE

Introduction

Land use along the established utility corridor consists of industrial, open space, agricultural, and park use. The project is consistent with current zoning and land use designations within the City of Hayward, Union City and the City of Fremont.

Impacts of Reconductoring

The reconductoring of the electric transmission line would require the temporary stockpiling of materials and equipment in approved areas along the existing PG&E right-of-way. Any impacts to land use would be isolated and short term while construction

crews reconductor the existing transmission lines. Because the stockpile areas would be temporary and would not displace any existing use, the impact would not be significant.

Reconductoring would also require access to the existing transmission line right-of- way by construction vehicles and equipment, which would use existing PG&E access roads.

Mitigation

There are no significant land use impacts along the electrical transmission line route related to the identified reconductoring project, and mitigation measures are not warranted.

Conclusion

Reconductoring of the Eastshore-Dumbarton transmission line would not cause a change in land use. Since the reconductoring construction activity and resulting change would be entirely within an existing and established right-of-way, the reconductored transmission line would not disrupt or divide the physical arrangement of an established community. Also for these reasons, the reconductored transmission line would not restrict existing or future land uses along the route.

3.4 NOISE

Introduction

Reconductoring the Eastshore-Dumbarton line would require operation of heavy equipment at pull and tensioning sites, and at several transmission towers that may require modification. The potential exists for heavy equipment operation to disturb adjacent noise-sensitive land uses during the temporary period of line work.

Impacts of Reconductoring

Reconductoring work would require operation of construction-type equipment at the pull and tensioning sites. Based on assumptions made for PG&E's Eastshore-San Mateo reconductoring project that was part of the original RCEC (01-AFC- 7) facility approved by the Energy Commission in 2001, work intervals of less than one week will likely occur at any one location. Work would also likely occur between 7 a.m. and 5 p.m. on weekdays. Sensitive receptors such as residences are likely to be located within 300 feet of towers 29, 30, 45 and 46..

After reconductoring the lines, Energy Commission staff would not expect any substantial increase in corona noise levels. Corona noise is a function of the line voltage and the condition of the line. Because voltage would remain the same after reconductoring and the condition of the line would be upgraded, corona noise may actually be reduced.

Mitigation

The transmission reconductoring project is not jurisdictional to the Energy Commission. The CPUC will license it. However, for the CPUC license, Energy Commission staff recommends implementation of general mitigation measures similar to the proposed conditions of certification from the Staff Assessment **NOISE-1, NOISE-2**, and **NOISE-8**,

to minimize potential impacts by implementing the complaint resolution process and specifying construction hours. For convenience, those conditions of certification are listed below:

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, Union City, City of Fremont 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.

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.

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.

Conclusion

Potential noise impacts can be avoided by implementing mitigation measures similar to the conditions of certification that were proposed in the Staff Assessment for construction of the proposed facility.

3.5 TRAFFIC AND TRANSPORTATION

Introduction

The existing transportation network that would be affected by the reconductoring project are local roadways in the Cities of Hayward, Union City and Fremont. It is estimated by the project owner that the project will require a maximum of 20 workers over a five month period. Three to five pieces of equipment (i.e. tensioners and cable pullers mounted on large trucks) and support vehicles will be required at each work site. The project owner has not specified where these trucks would be stationed during the tensioning and cable pulling activity.

Impacts of Reconductoring

The proposed reconductoring project could affect the level of service (LOS) for transportation facilities under the jurisdiction of Caltrans and the Cities of Hayward, Union City and Fremont.

Although the reconductoring project will require no more than 20 workers, adding any additional vehicles to local roadways of regional significance could result in increased delays and congestion. The number of reconductoring project workers arriving during the morning peak hour and leaving during the evening peak hour could result in further LOS degradation on the surrounding local transportation system. The movement of heavy machinery or the possible need to use rail lines to deliver equipment or materials to the project site could also affect the surrounding transportation system.

Occasionally during overhead construction projects, materials fall into the roadway, resulting in a safety hazard. This potential impact can be avoided through mitigation, which is discussed below.

Mitigation

In order to mitigate potential impacts of the reconductoring project on the surrounding roadway system, the work crews involved should avoid adding any vehicles to regional and local highways and roads during peak travel times. This avoidance can be accomplished through using off-site facilities for reconductoring staging and laydown, non-peak hour scheduling, and workers carpooling to the job site. These measures would reduce the potential for project-related congestion.

Using off-peak period scheduling for delivery of equipment and materials via trucks or rail service can also avoid potential impacts during peak hour conditions. Scheduling worker arrival and departure patterns to occur before the morning peak period (i.e. 6:00 to 9:00 AM) and before the evening peak period (i.e. 3:30 to 6:30 PM) would also mitigate potential impacts of the reconductoring project. Finally, installation of protective structures as a safety precaution would reduce the potential for construction materials falling on motorists, bicyclists, or pedestrians during the tensioning/cable pulling process.

Conclusion

Implementation of these mitigation measures would most likely ensure that any potential impacts of the reconductoring project to traffic and transportation will be insignificant.

3.6 TRANSMISSION LINE SAFETY AND NUISANCE

Introduction

The electro-magnetic field (EMF) impacts that were addressed in the Transmission Line Safety and Nuisance (TLSN) section of this Staff Assessment for the RCEC Amendment would also be of potential concern for the area along the route of the reconductored line. As noted, the magnitude of such fields depends on line voltage and current levels. The potential for perceivable field impacts and significant field exposures would depend on the chosen design, the current levels, and distance from the line.

Since the reconductored line would be located within the route of the existing line, the retrofit-related increases in magnetic field intensity would lead to corresponding increases in human exposure to the line's magnetic fields. The only field exposures of potential significance are to line workers and individuals in transit across the line. These types of exposures are well understood as not significantly related to the present

health concern. The present CPUC design and operational requirements are intended to minimize these and other human exposures without affecting line safety, reliability, and efficiency. Since the retrofitted line would be operated at the same voltage (115 kV) as the existing line, the EMF along the line route should not change provided the reconductoring construction complies with CPUC's General Order (GO) 95 and Title 8 California Code of Regulations (CCR) Construction Safety Orders with the same ground and line clearances.

PG&E also identified four locations where distribution lines passing underneath the Eastshore-Dumbarton 115 kV transmission line could pose a potential safety issue when the transmission line is being pulled during the reconductoring. PG&E determined that the distribution lines could be taken out of service during the pulls, eliminating the need to construct temporary crossing structures at the three locations that could affect wetlands, near towers 17, 22, and 24.

Mitigation

As discussed in the TLSN section of the Staff Assessment, the CPUC's method of ensuring the appropriate management of fields from high-voltage power lines (in light of the current health concern) is to require incorporation of specific field-reducing measures in the design for new or retrofitted lines. The applicable measures for the proposed RCEC line and the reconductored Eastshore-Dumbarton line are those specified in PG&E's guidelines prepared in compliance with CPUC's requirements. Staff's recommended conditions of certification in the TLSN section of the Staff Assessment are intended to ensure compliance with this CPUC policy as related to field strengths, perceivable field effects, electric shocks, and human exposure.

Conclusion

The retrofitted Eastshore to Dumbarton 115 kV line would be designed, built and operated (within the existing route) according to CPUC's requirements, reflecting compliance with the health and safety LORS of concern to staff. Therefore, staff would not expect its operation to pose a significant health and safety hazard to individuals in the area.

3.7 VISUAL RESOURCES

Introduction

The Eastshore-Dumbarton reconductoring project includes approximately seven miles of 115kv transmission line between the East Shore substation located in Hayward and the Dumbarton Substation located in Fremont. The line extends south-southeast from the Eastshore Substation across the salt ponds and farther south through open space and agricultural lands west of Hayward, Union City, and Fremont. Six miles south of the Eastshore Substation, the line turns east-northeast and runs one mile, mostly along a pedestrian trail, through suburban portions of Fremont to the Dumbarton Substation.

Impacts of Reconductoring

The Eastshore to Dumbarton reconductoring project is expected to last about five months. The reconductoring project would require temporary staging areas for equipment and materials storage. The location of the staging yards is presently

unknown. Conductor pulling and tensioning equipment would be located at various sites along the transmission line. Due to the relatively temporary nature of project construction, the adverse visual impacts that would occur during construction would not be significant. However, this conclusion assumes that construction areas and rights-of-way are restored to their pre-project conditions.

Reconductoring involves the replacement of existing electrical transmission wires (conductors) with new wires. This change to the Eastshore-Dumbarton transmission line would likely be undetectable to most viewers of the line. This conclusion assumes that the new wires and towers would incorporate typical measures to mitigate potentially significant adverse visual impacts, such as those listed below.

Mitigation

With the inclusion of the following typical mitigation measures, impacts from construction activities related to reconductoring would likely not be significant:

- All evidence of construction activities, including ground disturbance due to staging and storage areas should be removed and remediated upon completion of construction.
- Construction areas and rights-of-way should be restored to their original grade and contouring.
- Any vegetation removed in the course of construction should be replaced on a 1-to-1 in-kind basis.

With the inclusion of the following typical mitigation measures, operation of the reconductored line would likely not cause significant adverse visual impacts:

- Transmission towers should be treated with non-glare finishes and painted in colors that would blend with the surrounding environment;
- Non-specular conductors should be used; and
- Insulators should be non-reflective and non-refractive.

Conclusion

The reconductoring project has the potential to cause adverse visual impacts, such as through the use of inappropriate paints and finishes that would make existing or new structures more dominant in the existing viewshed. However, feasible mitigation measures are available that would likely keep the visual impacts of the reconductoring project to levels that would not be significant. Other mitigation measures to reduce the visual impacts of the project may be identified as more detailed and specific environmental information is developed and analyzed.

3.8. SOIL AND WATER RESOURCES

Introduction

This transmission line is found in the Bay Flats ecological subsection which includes the coastal plains along the southern end of the San Francisco Bay. This subsection

occurs on Quaternary alluvial sediments of the bay margins, comprised primarily of silt and clay. These soils tend to be very deep and poorly drained and are characteristic of clays formed in tidal flats. These soil types have low erosion potential, low permeability and a high potential for shrinking and swelling. Land in the area in nearly level, with elevations typically less than 10 feet above sea level.

Impacts of Reconductoring

Towers and Footings

There are a total of 46 towers between the substations. Though unlikely, some towers may require new foundations, increasing the potential for disturbance and erosion of soils. If any new towers and footings are constructed, Best Management Practices (BMPs), such as dewatering facilities and limiting disturbed areas, would be implemented to avoid water quality degradation. By implementing BMPs, the aforementioned activity would be less than significant.

Reconductoring without New Towers and Footings

If existing towers can be used or reinforced without construction of new towers and footings, the potential for impacts to soils and water resources is significantly reduced. Work sites using larger truck-mounted equipment would likely be limited to areas near angle towers (greater than 20 degrees). Temporary pull and tensioning sites would require an area of about 100 by 200 feet (0.5 acre) for equipment setup. These temporary sites would be susceptible to erosion from soil disturbance and compaction as a result of the vehicular traffic.

Mitigation

Towers and Footings

The following mitigation measures should be implemented for earth disturbance activities associated with any needed work on tower footings:

- Construction should be performed in accordance with an Erosion and Sediment Control Plan (ESCP). The ESCP should address soil stabilization during construction, and revegetation following construction. The CPUC would have jurisdiction with the Cities of Hayward, Union City and Fremont likely serving as the commenting authorities for the ESCP.
- Construction should be performed in accordance with a Storm Water Pollution Prevention Plan (SWPPP). The San Francisco Bay Regional Water Quality Control Board (RWQCB) would likely serve as the reviewing authority of the SWPPP, and may require a General NPDES Permit for Storm Water Discharge Associated with Construction Activity. The RWQCB may also designate issuing Waste Discharge Requirements associated with construction activities.
- Existing roads and rights of way should be used to the greatest extent possible.

Reconductoring

For temporary disturbance areas established on soil for pull and tensioning sites, and for work sites set up to modify existing towers, the following mitigation should be included:

- Construction should be performed in accordance with an Erosion and Sediment Control Plan (ESCP). The ESCP should address soil stabilization during construction, and revegetation following construction. The CPUC would have jurisdiction with the Cities of Hayward, Union City and Fremont likely serving as the commenting authorities for the ESCP.
- Construction should be performed in accordance with a Storm Water Pollution Prevention Plan (SWPPP). The San Francisco Bay Regional Water Quality Control Board (RWQCB) would likely serve as the reviewing authority of the SWPPP, and may require a General NPDES Permit for Storm Water Discharge Associated with Construction Activity.
- Existing roads and rights of way should be used to the extent possible.

Conclusion

The identified reconductoring project would cause no displacement of agricultural land use, and neither construction nor operation of the transmission line would cause a significant impact to agricultural resources. Significant environmental impacts to soil and water resources will be avoided by implementing the mitigation listed above.

3.9 TRANSMISSION SYSTEM ENGINEERING

Introduction

The Eastshore-Dumbarton 115 kV line will be reconductored with a bundled 477 kcmil Steel Supported Aluminum Conductors (SSAC), in a manner that complies with applicable safety and reliability standards. As a result the thermal capacity of the line will increase from 838 amperes normal and 948 amperes emergency to 1541 amperes normal and emergency. Insulators would also be removed and replaced with new strings, which would increase the line's capability to withstand voltage surges.

Impacts of Reconductoring

During construction, applicable safety and reliability LORS must be met. These include CPUC GO-95, Title 8 CCR Construction Safety Orders, and PG&E Construction Standards. Additionally, to maintain system reliability the California ISO must be advised per the California ISO scheduling protocol of scheduled circuit outages prior to occurrence. Such outages are scheduled about 30 days prior to occurrence and are verified just prior to actual outage. In the event that system reliability requires restoring such circuits, a "no work" order is given and where practicable, circuits are restored.

Reconductoring of the Eastshore-Dumbarton 115kV Transmission Line would result in local system benefits, in that it would provide considerably greater flexibility in routing power in the Southern East Bay Area transmission network, even if the RCEC is not built. The reconductoring project would not only ensure that the RCEC could generate at its rated capacity, but would increase the capacity and reliability of power deliveries into the Cities of Fremont and Newark.

Mitigation

To mitigate potential safety and reliability impacts, the above stated LORS and California ISO scheduling protocols would be used. The CPUC assures conformance

with the above safety requirements; the California ISO would assure conformance with its reliability requirements.

Conclusion

Conformance with applicable safety and reliability is likely to occur and would be successful in mitigating any safety or reliability implications of reconductoring.

3.10 GEOLOGY AND PALEONTOLOGY

Introduction

The existing Eastshore to Dumbarton Transmission Line generally traverses unconsolidated sediments deposited within and along the margins of San Francisco Bay. These sediments typically comprise recent alluvium along the margins of San Francisco Bay and young bay mud on the floor of the Bay. The young bay mud is a plastic, poorly sorted, organic-rich clay and silty clay, with interbedded thin beds of well-sorted silt, sand, and fine gravel that was deposited in a marine environment following the end of the last low sea-level stand about 11,000 years ago (Atwater et al., 1977). Because of its young age and marine origin, young bay mud has limited potential as a host of scientifically unique fossils.

No active or potentially active faults are known to cross the Transmission Line Corridor. The closest known active fault is the Hayward fault, which is located 5.3 kilometers (3.3 miles) east of the corridor. This fault is designated a class “A” fault under the CBC (a fault with a maximum magnitude earthquake greater than 7 and a slip rate in excess of 5 mm/year). The maximum magnitude earthquake for the segment of Hayward fault closest to the project is a moment magnitude 7.0 event. A maximum magnitude earthquake on this fault will produce strong ground shaking along the transmission line corridor.

The California Division of Mines and Geology (CDMG) Map Sheet 48 (Petersen et. al., 1996) predicts a peak ground acceleration with a 10 percent probability of exceedance in 50 years of between 0.5 and 0.7g for the project corridor. Since the corridor overlies younger Bay mud (CBC Soil Profile Type S_f), the corridor will likely experience amplification of seismic shaking and potential liquefaction during an earthquake.

Impacts of Reconductoring

Since no new facilities are anticipated, the impacts to geologic and paleontological resources would be limited to temporary construction sites. These sites would not require substantial grading or other disturbance of surface soils. As a result the impacts to geologic and paleontological resources would not be significant.

In addition, the identified reconductoring project would not change the impacts of the seismic hazards on the Eastshore-Dumbarton Transmission line. Since the Eastshore-Dumbarton Transmission Line corridor does not cross a fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist, the potential for fault rupture is not significant. Similarly, the reconductoring project will not increase potential impacts associated with strong ground shaking, liquefaction, seismic seiches, nor landslides or other slope failures.

Mitigation

No additional mitigation measures are required.

Conclusion

PG&E would likely be able to comply with applicable LORS related to the identified reconductoring project. No significant geologic or paleontological resources have been identified in the project area. The existing transmission line was designed and constructed in accordance with the Seismic Zone 4 requirements contained in the California Building Code. In addition, the project owner proposes to mitigate impacts due to seismic hazards by complying with the requirements and design standards of the CBC (1998). The project should have no adverse impact with respect to geologic and paleontologic resources if it complies with applicable LORS.

4 CONCLUSION

Sections 2 and 3 of this Appendix describe the process and the potential impacts of reconductoring the Eastshore-Dumbarton 115kV Transmission Line. This study was undertaken to inform the Energy Commission and the general public of the potential indirect environmental and public health effects caused by the approval of the RCEC.

The environmental and engineering disciplines can be divided into two groups: those with the potential for significant impacts, and those in which impacts are easily mitigable or less than significant. This analysis determined that impacts in the following discipline areas would likely be less than significant for reconductoring projects (some with implementation of standard mitigation measures, such as fugitive dust control to control emissions of particulate matter during construction, for example):

- Air Quality
- Facility Design
- Hazardous Materials Management
- Power Plant Efficiency
- Power Plant Reliability
- Public Health
- Worker Safety
- Socioeconomic Resources
- Waste Management
- Worker Safety

The disciplines where potential impacts from reconductoring are of most concern are biological resources, cultural resources, and traffic & transportation. The conclusions of these analyses are described below.

Biological Resources: Because it appears some of the reconductoring work would occur in or near sensitive species and/or habitats, staff concludes that reconductoring the Eastshore-Dumbarton line could adversely impact sensitive biological resources in and/or adjacent to the transmission line corridor. Staff recommends that after PG&E

completes its final construction, that it submit a complete project description (including wetland delineations, results of all sensitive species surveys, and a revised assessment of potential impacts) to the project's lead agency, which would ensure the reconductoring complies with applicable Federal, State and local laws, ordinances and regulations. Staff also recommends consultation with the California Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Army Corp of Engineers, Regional Water Quality Control Board and the Bay Conservation and Development Commission to identify potential impacts and develop mitigation measures that would avoid, eliminate, reduce to a less than significant level or compensate for those impacts. Therefore, if the reconductoring work complies with all applicable LORS, mitigation measures proposed by the project owner (i.e., PG&E) are implemented, and standard Best Management Practices for construction activities are employed, the reconductoring of the Eastshore-Dumbarton line would not likely create significant impacts to Biological Resources.

Cultural Resources: An archaeological and historic survey should be conducted after the major work areas associated with the reconductoring project are identified. If sensitive archaeological or historic resources are identified, the project owner (i.e., PG&E) and the lead agency should conduct a preconstruction assessment and develop a training program. In addition, excavation (if any), pulling and tensioning, modifying towers, and other key project activities taking place within archaeological sites should be monitored. If cultural material is identified, the construction should be halted until the find can be evaluated. Staff recommends that after the construction area has been identified and after the cultural resources surveys are completed that archaeological sites be evaluated for eligibility for listing in the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR). If avoidance is not possible, data recovery should be conducted as a mitigation measure for archaeological sites that are recommended as eligible to the CRHR or NRHP and would be impacted by the project. The Native American Heritage Commission would need to be contacted to determine whether there are any Native American sacred sites in the vicinity of the work. The proposed reconductoring route may be sensitive for cultural resources. However, it will be possible to mitigate all impacts to cultural resources to a less than significant level.

Traffic and Transportation: In order to mitigate potential impacts of the reconductoring project on the surrounding roadway system, the work crews involved should avoid adding any vehicles to local roadways during peak travel times by using off-site facilities for reconductoring staging and laydown, non-peak hour scheduling, and workers carpooling to the job site. Finally, installation of protective structures as a safety precaution would reduce the potential for construction materials falling on motorists, bicyclists, or pedestrians during the tensioning/cable pulling process. Implementation of these mitigation measures would likely ensure that any potential impacts of the reconductoring project to traffic and transportation will be insignificant.

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6 LIST OF CONTRIBUTORS

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GENERAL CONDITIONS
INCLUDING
COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Lance Shaw

INTRODUCTION

The project's General Compliance Conditions of Certification, including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in compliance with public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of elements that:

1. set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
2. set forth the requirements for handling confidential records and maintaining the compliance record;
3. state procedures for settling disputes and making post-certification changes;
4. state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions of certification;
5. establish requirements for facility closure plans; and
6. specify conditions of certification for each technical area containing the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

DEFINITIONS

The following terms and definitions are used to establish when Conditions of Certification are implemented.

PRE-CONSTRUCTION SITE MOBILIZATION

Site mobilization is limited preconstruction activities at the site to allow for the installation of construction trailers, construction trailer utilities, and construction trailer parking at the site. Limited ground disturbance, grading, and trenching associated with the above mentioned pre-construction activities is considered part of site mobilization. Fencing for the site is also considered part of site mobilization. Walking, driving or parking a passenger vehicle, pickup truck and light vehicles is allowable during site mobilization.

CONSTRUCTION GROUND DISTURBANCE

Construction-related ground disturbance refers to activities that result in the removal of top soil or vegetation at the site and for access roads and linear facilities.

CONSTRUCTION GRADING, BORING, AND TRENCHING

Construction-related grading, boring, and trenching refers to activities that result in subsurface soil work at the site and for access roads and linear facilities, e.g., alteration of the topographical features such as leveling, removal of hills or high spots, moving of soil from one area to another, and removal of soil.

CONSTRUCTION

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

1. the installation of environmental monitoring equipment;
2. a soil or geological investigation;
3. a topographical survey;
4. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; and
5. any work to provide access to the site for any of the purposes specified in "Construction" 1, 2, 3, or 4 above.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, "commercial operation" begins after the completion of start-up and commissioning, where the power plant has reached reliable steady-state production of electricity at the rated capacity. For example, at the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

The CPM will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Energy Commission Decision;
2. resolving complaints;
3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and
5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, the approval will involve all appropriate Energy Commission staff and management.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM usually schedules pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight, and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain as a public record, in either the Compliance file or Dockets file, for the life of the project (or other period as required):

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. all monthly and annual compliance reports filed by the project owner;
3. all complaints of noncompliance filed with the Energy Commission; and
4. all petitions for project or condition of certification changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that the compliance conditions of certification and all of the other conditions of certification that appear in the Commission Decision are satisfied. The compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, conditions of certification, or ownership. Failure to comply with any of the conditions of certification or the compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate. A summary of the Compliance Conditions of Certification is included as **Compliance Table 1** at the conclusion of this section.

COMPLIANCE CONDITIONS OF CERTIFICATION

Unrestricted Access (COMPLIANCE-1)

The CPM, responsible Energy Commission staff, and delegate agencies or consultants shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

Compliance Record (COMPLIANCE-2)

The project owner shall maintain project files onsite or at an alternative site approved by the CPM, for the life of the project unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all "as-built" drawings, all documents submitted as verification for conditions, and all other project-related documents.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

Compliance Verification Submittals (COMPLIANCE-3)

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission's procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
2. providing appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of work or other evidence that the requirements are satisfied.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal**. The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a

specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

If the project owner desires Energy Commission staff action by a specific date, it shall so request in its submittal cover letter and include a detailed explanation of the effects on the project if this date is not met.

Pre-Construction Matrix and Tasks Prior to Start of Construction (COMPLIANCE-4)

Prior to commencing construction, a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's **first** compliance submittal or prior to the first pre-construction meeting, whichever comes first. It will be in the same format as the compliance matrix described below.

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times (e.g., 30, 60, 90 days) for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project development.

If the project owner anticipates starting project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. This is important if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change based upon the Commission Decision.

Compliance Reporting

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Energy Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual

Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix (COMPLIANCE-5)

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all conditions of certification in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable; and
7. the compliance status of each condition, e.g., “not started,” “in progress” or “completed” (include the date).

Satisfied conditions do not need to be included in the compliance matrix after they have been identified as satisfied in at least one monthly or annual compliance report.

Monthly Compliance Report (COMPLIANCE-6)

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date upon which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the **Key Events List. The Key Events List Form is found at the end of this section.**

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and eight copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);

4. a list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;
5. a list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings submitted to, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. a listing of the month's additions to the on-site compliance file; and
10. a listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolution of the resolved actions, and the status of any unresolved actions.

Annual Compliance Report (COMPLIANCE-7)

After construction is complete, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings submitted to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file;
9. an evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see Compliance Conditions for Facility Closure addressed later in this section]; and

10. a listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved matters, and the status of any unresolved matters.

Confidential Information (COMPLIANCE-8)

Any information that the project owner deems confidential shall be submitted to the Energy Commission's Dockets Unit with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

Annual Energy Facility Compliance Fee (COMPLIANCE-9)

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay an annual fee currently sixteen thousand eight hundred fifty dollars ($16,850), which will be adjusted annually on July 1. The initial payment is due on the date the Energy Commission adopts the final decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

Reporting of Complaints, Notices, and Citations (COMPLIANCE-10)

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with date and time stamp recording. All recorded complaints shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at:

http://www.energy.ca.gov/sitingcases/power_plants_contacts.html

Any changes to the telephone number shall be submitted immediately to the CPM, who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to the CPM of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or

unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, Ordinances, Regulations and Standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place: planned closure, unplanned temporary closure and unplanned permanent closure**.**

CLOSURE DEFINITIONS

Planned Closure

A planned closure occurs when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unplanned Temporary Closure

An unplanned temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster or an emergency.

Unplanned Permanent Closure

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unplanned closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

COMPLIANCE CONDITIONS FOR FACILITY CLOSURE

Planned Closure (COMPLIANCE-11)

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least 12 months (or other period of time agreed to by the CPM) prior to commencement of closure activities. The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;

3. identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

Prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

In the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities until the Energy Commission approves the facility closure plan.

Unplanned Temporary Closure/On-Site Contingency Plan (COMPLIANCE-12)

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less that 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.

If the CPM determines that an unplanned temporary closure is likely to be permanent, or for a duration of more than 12 months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

Unplanned Permanent Closure/On-Site Contingency Plan (COMPLIANCE-13)

The on-site contingency plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan, consistent with the requirements for a planned closure, shall be developed and submitted to the CPM within 90 days of the permanent closure or another period of time agreed to by the CPM.

Post Certification Changes to the Energy Commission Decision: Amendments, Ownership Changes, Insignificant Project Changes and Verification Changes (COMPLIANCE-14)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility. **It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769.** Implementation of a project modification without first securing Energy Commission, or Energy Commission staff approval, may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for **amendments** and for **insignificant project changes** as specified below. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the CPM, who will file it with the Energy Commission's Dockets Unit in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below. They reflect the provisions of Section 1769 at the time this condition was drafted. If the Commission's rules regarding amendments are amended, the rules in effect at the time an amendment is requested shall apply.

Amendment

The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769, when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the final decision, which requires public notice and review of the Energy Commission staff analysis, and approval by the full Commission. This process takes approximately two to three months to complete, and possibly longer for complex project modifications.

Change of Ownership

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process takes approximately one month to complete, and requires public notice and approval by the full Commission.

Insignificant Project Change

Modifications that do not result in deletions or changes to conditions of certification, that are compliant with laws, ordinances, regulations and standards and do not result in a potential significant environmental impact may be authorized by the CPM as an insignificant project change pursuant to section 1769(a) (2). This process usually takes less than one month to complete, and it requires a 14-day public review of the Notice of Insignificant Project Change that includes staff's intention to approve the modification unless an objection is filed.

Verification Change

A verification may be modified by the CPM without requesting an amendment to the decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification. This process usually takes less than five working days to complete.

CBO DELEGATION AND AGENCY COOPERATION

In performing construction and operation monitoring of the project, Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Energy

Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Energy Commission staff retains CBO authority when selecting a delegate CBO, including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Energy Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental protection when conducting project monitoring.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider. Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1237, but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by future law or regulations.

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy Commission about power plant construction or operation-related questions, complaints or concerns.

Informal Dispute Resolution Procedure

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237, but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy

Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be brought before the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

Request for Informal Investigation

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven working days of the CPM's request, provide a written report to the CPM of the results of the investigation, including corrective measures proposed or undertaken. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within 48 hours, followed by a written report filed within seven days.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures proposed or undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and
4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum that fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint with the Energy Commission's Dockets Unit. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230.

KEY EVENTS LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
Synchronization with Grid and Interconnection	
Complete T/L Construction	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
Complete Gas Pipeline Construction	
WATER SUPPLY LINE ACTIVITIES	
Start Water Supply Line Construction	
Complete Water Supply Line Construction	

COMPLIANCE TABLE 1
SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-1	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COMPLIANCE-2	Compliance Record	The project owner shall maintain project files on-site. Energy Commission staff and delegate agencies shall be given unrestricted access to the files.
COMPLIANCE-3	Compliance Verification Submittals	The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed or the project owner or his agent.
COMPLIANCE-4	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until the all of the following activities/submittals have been completed: ▪ property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns, ▪ a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction, ▪ all pre-construction conditions have been complied with, ▪ the CPM has issued a letter to the project owner authorizing construction.
COMPLIANCE-5	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification.
COMPLIANCE-6	Monthly Compliance Report including a Key Events List	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Energy Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List.
COMPLIANCE-7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports.

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-8	Confidential Information	Any information the project owner deems confidential shall be submitted to the Energy Commission's Dockets Unit with a request for confidentiality.
COMPLIANCE-9	Annual fees	Payment of Annual Energy Facility Compliance Fee
COMPLIANCE-10	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.
COMPLIANCE-11	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least 12 months prior to commencement of a planned closure.
COMPLIANCE-12	Unplanned Temporary Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COMPLIANCE-13	Unplanned Permanent Facility Closure	To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COMPLIANCE-14	Post-certification changes to the Decision	The project owner must petition the Energy Commission to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of operational control of the facility.

ATTACHMENT A

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: AFC Number:
COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number: _____
Date and time complaint received: Indicate if by telephone or in writing (attach copy if written): Date of first occurrence:
Description of complaint (including dates, frequency, and duration):
Findings of investigation by plant personnel: Indicate if complaint relates to violation of a CEC requirement: Date complainant contacted to discuss findings: _____
Description of corrective measures taken or other complaint resolution: Indicate if complainant agrees with proposed resolution: If not, explain: Other relevant information:
If corrective action necessary, date completed: _____ Date first letter sent to complainant: _____(copy attached) Date final letter sent to complainant: _____(copy attached)
This information is certified to be correct. Plant Manager's Signature: _____ Date:

(Attach additional pages and supporting documentation, as required.)

RUSSELL CITY ENERGY CENTER PROJECT
AMENDMENT #1
PREPARATION TEAM

Executive Summary ..... Lance Shaw
Introduction ..... Lance Shaw
Project Description ..... Lance Shaw
Air Quality ..... Tuan Ngo
Biological Resources ..... Marc Sazaki
Cultural Resources ..... Dorothy Torres
Hazardous Materials Management ..... Alvin Greenberg, PhD
Land Use ..... Shaelyn Strattan
Noise And Vibration ..... Steve Baker, P.E.
Public Health ..... Alvin Greenberg, PhD
Socioeconomic Resources ..... Amanda Stennick
Soil And Water Resources ..... Richard Latteri
Traffic and Transportation ..... Jim Adams & William Walters
Transmission Line Safety and Nuisance ..... Obed Odoemelam, PhD
Visual Resources ..... Mark Hamblin
Waste Management ..... Ellie Townsend-Hough
Worker Safety and Fire Protection ..... Alvin Greenberg, PhD
Facility Design ..... Shabab Khoshmashrab
Geology and Paleontology ..... Patrick A. Pilling, PhD, P.E.,G.E.
Power Plant Efficiency ..... Shabab Khoshmashrab
Power Plant Reliability ..... Shabab Khoshmashrab
Transmission System Engineering ..... Mark Hesters, P.E. / Ajoy Guha, P.E.
Reconductoring ..... Stanley Yeh
General Conditions ..... Lance Shaw
Compliance Project Secretary ..... Marci Errecart
Assistant Compliance Project Manager ..... Ron Yasny

DECLARATION OF
Lance Shaw

I, **Lance Shaw** declare as follows:

1. I am presently employed by the California Energy Commission in the **Siting OFFICE** of the Systems Assessments and Facilities Siting Division as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Introduction, Project Description, Executive Summary, and Compliance General Conditions**, for the Russell City Energy Center Petition to Amend-Amendment,1 based on my independent analysis of the Petition to Amend the project and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 21 June 07 Signed: Lance Shaw

At: Sacramento, California

Resume of Lance Shaw
Compliance Project Manager (Planner II)

Experience Summary: **California Energy Commission (CEC)** – Oct. '02 to Present, Compliance Proj. Mgr. System Assessment & Facilities Siting Div. (SAFSD). Facilities Siting and Environmental Protection Division. Duties include: Managing multiple compliance projects including processing amendments to Commission Decisions. Reviewing Staff Assessments sections with emphasis on conditions of certification and verifications. Preparing and presenting testimony on compliance general conditions, and plant closure issues in public forums, workshops and hearings. Developing Memoranda of Understanding between the Commission and delegate Chief Building Officials (CBO) to ensure that projects are designed constructed and operated in conformance with the Commission Decision; all applicable laws, ordinances, regulations and standards; and the California Building Code.

CEC - Aug. '99 to Oct.'02, Siting Proj. Mgr., SAFSD. Duties included managing the work of multidisciplinary teams analyzing potential impacts of proposed power plants. Assisted on data adequacy on Morro Bay, and alternatives analysis on Three Mountain Power Project. Project manager of Blythe Energy Project, San Mateo Substation Project, Scott Substation Project, Rio Linda/Elverta Power Project, Roseville Energy Facility, and Avenal Energy Project.

Telecommunications Division of General Services – July '94 to July '99, Associate Telecom Engr., & Proj. Mgr. Duties included managing the work of teams designing and installing public service safety systems for several state agencies, including Dept. of Water Resources, Dept. of Corrections, Highway Patrol, and Dept. of Parks and Recreation. Before promoting to the Associate level, I worked as an electrical engineer.

U.S. Small Business Administration, Disaster Relief Div. – July '92- July '94, Construction Analyst (Team Lead) Trained, managed, and reviewed the work of as many as 30 engineers, architects, contractors and others working in "declared disaster" areas. Assessed disaster-related damage losses to business and homeowners, and recommending approvals for low interest loans, to restore the economy rapidly. I worked such disasters as Big Bear/ Landers earthquake of 6/92, Hurricane Iniki (on Kauai) 9/92, Dakota floods of 8/93, and Northridge earthquake of 1/94.

Prior to '92, I managed multi-disciplinary teams as a project manager in several industries. I have managed a mechanical engineering department, a marketing department, and a sale and service department, purchasing departments. I have successfully managed and performed in 5 Fortune 500 companies (Including GE's Nuclear Energy Div.) and start-ups. I worked 15 years in "Silicon Valley" managing high-technology project teams in the semiconductor wafer processing equipment industry, computer manufacturing, and semiconductor marketing engineering. As an adjunct (graduate and undergraduate) professor for the University of Phoenix's 6-campus Sacramento Valley Region, I earned the distinction as the most outstanding undergraduate business professor in 1998, and again in 1999. I was one of the editors on two best-selling business/creative books by Roger von Oech, Ph.D. "A Whack on the Side of the Head", and "A Kick in the Seat of the Pants". I wrote and got published two articles on creative parenting as a single joint-custody dad of two pre-schoolers.

Education: Bachelor of Science, Electrical Eng. – New Mexico State Univ. 1/68.
Master of Arts, Business Administration – Arizona State Univ. 8/69.

DECLARATION OF

I, Tuan Ngo, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Systems Assessments and Facilities Siting Division as a Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Air Quality** for the Russell City Energy Center project based on my independent analysis of the Amended Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 6/27/07 Signed: _____

At: Sacramento, California

DECLARATION OF
MARC SAZAKI

I, Marc Sazaki declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Energy Facility Siting Division as a Planner II, Energy Facility Siting.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Biological Resources, for the Russell City Energy Center Petition for Amendment No. 1 based on my independent analysis of the petition and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 18, 2007 Signed: Marc Sazaki

At: Sacramento, California

DECLARATION OF
Dorothy Torres

I, Dorothy Torres declare as follows:

I am presently employed by the California Energy Commission in the Environmental Office of the Facilities Siting Division as a Planner II.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I prepared the Staff Assessment on Cultural Resources for Proposed Amendment No. 1, Russell Energy Center and based on my independent analysis of the application for an amendment, supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: _____

At: Sacramento, California

Dorothy E. Torres

EXPERIENCE:

September 2002-
Present

Planner II: Biology and Cultural Unit,
Facilities Siting Division, California Energy Commission.
Duties: As a Planner II, I Identify, describe, and analyze complex cultural resources issues related to electrical energy production facilities, alternative energy technologies, energy research and development and Commission programs. This includes the preparation of sections of initial studies, environmental impact reports and Commission reports.

In addition, I prepare independent assessments of the cultural resources aspects of Notices of Intention, Applications for Certification, and Small Power Plant Exemptions. The final analyses include the preparation and presentation of expert technical testimony, which is presented at Commission hearings.

I also coordinate and work with federal, state, regional and local governments; cultural resources related agencies; environmental organization and universities; Native American or other ethnic groups; archaeological or historical professional organizations; and members of the general public regarding energy-related issues to assure their input into the Commission power plant siting process and other Commission programs.

Moreover, I lead or participate in workshops and meetings concerning Commission projects, programs and policies, amongst and between project applicants, staff, other governmental agencies, private organizations, and the public.

In addition, I examine and evaluate existing and proposed laws, ordinances, regulations, standards, and policies pertinent to the visual, cultural aspects of proposed energy facilities on Commission programs. After permitting, I evaluate the licensee's compliance with conditions of certification for power plant facilities.

April 2001-
August 2002

Planner I: Cultural, Socioeconomic and Visual Unit,

Systems Assessment and Facilities Division, California Energy Commission. Duties: I gather, organize and analyze cultural resources data and identify issues, impacts and mitigation measures ensuring compliance with the California Environmental Quality Act. I provide oversight for consultants working on siting applications in the area of cultural resources. I participate in workshops and meetings concerning Energy Commission projects and programs. In addition, I Interact with Division technical staff and staff representing other Divisions, local and regional government staff/decision makers, federal and state agency representatives and consultants/experts in the areas of anthropology, archaeology, history and related fields. I prepare written assessments of energy related documents.

December 1998-
March 2001

Energy Analyst: Community and Cultural Resources Unit, Energy Facilities Siting and Environmental Protection Division, California Energy Commission. Duties: I assist in gathering, organizing and analyzing cultural resources data and identify issues, impacts and mitigation measures. I assist in coordinating with local governments, resource protection agencies, environmental organizations and business organizations. Furthermore, I participate in workshops and meetings concerning Energy Commission projects and programs. I evaluate existing and proposed laws, ordinances, regulations, standards, and policies pertinent to the cultural resource aspect of proposed energy facilities. I prepare written assessments of energy related documents.

EDUCATION:

Spring 1988 — M.A., Anthropology
California State University, Sacramento

Spring 1980 — B.A., Anthropology and History
California State University, Sacramento

Professional Organizations — Society for California Archaeology
Sacramento Archaeological Society

DECLARATION OF
Testimony of Alvin Greenberg, Ph.D.

I, **Alvin Greenberg,** declare as follows:

1. I am presently a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Hazardous Materials**, **Public Health**, and **Worker Safety and Fire Protection** for the **Russell City Energy Center project Amendment** based on my independent analysis of the Application for Certification, Petition to amend the Decision and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 6/27/07 Signed: _____

At: Sacramento, California

Risk Science Associates

121 Paul Dr., Suite A, San Rafael, Ca. 94903-2047
415-479-7560 fax 415-479-7563
e-mail agreenberg@risksci.com

Name & Title: **Alvin J. Greenberg, Ph.D., FAIC, REA, QEP**
Principal Toxicologist

Dr. Greenberg has had over two decades of complete technical and administrative responsibility as a team leader for hazardous waste site characterization, preparation of human and ecological risk assessments, air quality assessments, interaction with regulatory agencies in obtaining permits, hazardous materials handling and risk management prevention, infrastructure vulnerability assessments, conducting lead surveys and studies, with particular expertise in the assessment of dioxins, lead, diesel exhaust, petroleum hydrocarbons, mercury, and the intrusion of subsurface contaminants into indoor air. Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the US EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, the California Air Resources Board Advisory Committee on Diesel Emissions, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is the former Chair of the Bay Area Air Quality Management District Hearing Board, a former member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA. And, since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments, power plant security programs, and conducting safety and security audits of power plants for the California Energy Commission. In addition to providing security expertise to the State of California, Dr. Greenberg is Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Years Experience: 25

Education:

B.S. 1969 Chemistry, University of Illinois Urbana

Ph.D. 1976 Pharmaceutical/Medicinal Chemistry, University of California, San Francisco

Postdoctoral Fellowship 1976-1979 Pharmacology/Toxicology, University of California, San Francisco

Postgraduate Training 1980 Inhalation Toxicology, Lovelace Inhalation Toxicology Research Institute, Albuquerque, NM

Professional Registrations:

Board Certified as a Qualified Environmental Professional (QEP)
California Registered Environmental Assessor - I (REA)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

Society for Risk Analysis
Air and Waste Management Association
American Chemical Society
American Association for the Advancement of Science
National Fire Protection Association

Technical Boards and Committee Memberships - Present:

Squaw Valley Technical Review Committee
(appointed 1986)

Technical Boards and Committee Memberships - Past:

July 1996 – March 2002
Member, Bay Area Air Quality Management District Hearing Board
(Chairman 1999-2002)
September 2000 – February 2001
Member, State Water Resources Control Board Noncompliant Underground Tanks Advisory Group
January 1999 – June 2001
Member, California Air Resources Board Advisory Committee on Diesel Emissions
January 1994 - September 1999
Vice-Chairman, State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee
September 1998
Member, US EPA Workgroup on Cumulative Risk Assessment
April 1997 - September 1997
Member, Cal/EPA Private Site Manager Advisory Committee
January 1986 - July 1996
Member, Bay Area Air Quality Management District Advisory Council
(Chairman 1995-96)
January 1988 - June 1995
Member: California Department of Toxic Substance Control Site Mitigation Program Advisory Group
January 1989 - February 1995
Member: Department of Toxics Substances Control Review Committee, Cal-EPA

October 1991 - February 1992
Chair: Pollution Prevention and Waste Management Planning Task Force of the Department of Toxics Substances Control Review Committee, Cal-EPA

September 1990 - February 1991
Member: California Integrated Waste Management Board Sludge Advisory Committee

September 1987 - September 1988
ABAG Advisory Committee on Regional Hazardous Waste Management Plan

March 1987 - September 1987
California Department of Health Services Advisory Committee on County and Regional Hazardous Waste Management Plans

January 1984 - October 1987
Member, San Francisco Hazardous Materials Advisory Committee

March 1984 - March 1987
Member, Lawrence Hall of Science Toxic Substances and Hazardous Materials Education Project Advisory Board

Jan. 1, 1986 - June 1, 1986
Member, Solid Waste Advisory Committee, Governor's Task Force on Hazardous Waste

Jan. 1, 1983 - June 30, 1985
Member, Contra Costa County Hazardous Waste Task Force

Sept. 1, 1982 - Feb. 1, 1983
Member, Scientific Panel to Address Public Health Concerns of Delta Water Supplies, California Department of Water Resources

Present Position

January 1983- present
Owner and principal with Risk Sciences Associates, a Marin County, California, environmental consulting company specializing in multi-media human health and ecological risk assessment, air pathway analyses, hazardous materials management-infrastructure security, environmental site assessments, and litigation support for toxic substance exposure cases.

Previous Positions

Jan. 2, 1983 - June 12, 1984
Member, State of California Occupational Safety and Health Standards Board (Cal/OSHA), appointed by the Governor

Aug. 1, 1979 - Jan. 2, 1983
Assistant Deputy Chief for Health, California Occupational Safety and Health Administration

Feb. 1, 1979 - Aug. 1, 1979
Administrative Assistant to Chairperson of Finance Committee, Board of Supervisors, San Francisco

Jan. 1, 1976 - Feb. 1, 1979
Research Pharmacologist and Postdoctoral Fellow, Department of Pharmacology and Toxicology, School of Medicine, University of California, San Francisco

Jan. 1, 1975 - Dec. 31, 1975
Acting Assistant Professor, Department of Pharmaceutical Chemistry, University of California, San Francisco

Experience

General

Dr. Greenberg has been a consultant in Human and Ecological Risk Assessment, Occupational Health, Toxicology, Hazardous Materials Management and Security, Hazardous Waste Site Characterization and Toxic Substances Control Policy for over 25 years. He has broad experience in the identification, evaluation and control of health and environmental hazards due to exposure to toxic substances. His experience includes Community Relations Support and Risk Communication through experience at high-profile sites and presentations at professional society meetings.

He has considerable experience in the review and evaluation of exposure via the air pathway - particularly to emissions from power plants and diesel exhaust - and a thorough knowledge of the regulatory requirements through his experience at Cal/OSHA, the BAAQMD Hearing Board, as a consultant to the California Energy Commission, and in preparing such assessments for local government and industry. He has assessed exposures to diesel exhaust during construction and operations of stationary and mobile sources and has testified at evidentiary hearings numerous times on this subject.

He served for over five years as the Vice-chair of the California State Water Resources Control Board Advisory Committee convened to address toxic substances in sediments in bays, rivers, and estuaries. He has also conducted numerous ecological risk assessments and characterizations, including those for marine and terrestrial habitats.

Since the events of 9/11, Dr. Greenberg has taken the lead for the California Energy Commission in developing a power plant vulnerability assessment methodology and model power plant security plan. He also assisted the CEC in the preparation of a “background” report on the risks and hazards of siting LNG terminals in California and consulted for the City of Vallejo on a proposed LNG terminal and storage facility at the former Mare Island Naval Shipyard. In August 2004, a team of experts led by Dr. Greenberg was awarded an 18-month contract by the State of Hawaii to update and improve the state’s Energy Emergency Preparedness Plan and make recommendations for increased security of critical energy infrastructure on this isolated group of islands.

Dr. Greenberg has extensive experience in data collection and preparation of human and ecological risk assessments on numerous military bases and industrial sites with Cal/EPA DTSC and RWQCB oversight. He has also been retained to provide technical services to the Cal/EPA Department of Toxic Substances Control (preparation of human health risk assessments) and the

Office of Environmental Health Hazard Assessment (review and evaluation of air toxics health risk assessments and preparation of profiles describing the acute and chronic toxicity of toxic air contaminants). He has also conducted several surveys of sites containing significant lead contamination from various sources including lead-based paint, evaluated potential occupational exposure to lead dust and fumes in industrial settings, prepared numerous human health risk assessments of lead exposure, and prepared safety and health plans for remedial investigation of lead oxide contaminated soil at DOD facilities.

Dr. Greenberg is also a recognized expert on the requirements of California's Proposition 65 and has served as an expert on Prop. 65 litigation.

Mercury Contamination

Dr. Greenberg has prepared and/or reviewed several human health and ecological risk assessments regarding mercury contamination in soils, sediments, and indoor surfaces. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Examples

Review and evaluation of a human health risk assessment of ingestion of sport fish caught from San Diego Bay and which contain tissue levels of mercury and PCBs (November 2004 – present)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Air Pathway Analysis

Dr. Greenberg has prepared numerous Air Pathway Analyses and human health risk assessments, evaluating exposure at numerous locations in California, Hawai'i, Oregon, Minnesota, Michigan, and New York. He is experienced in working with Region IX EPA, the State of California DTSC, and the Hawai'i Department of Health Clean Air Branch in the application of both site-specific and non site-specific health risk assessment criteria.

Examples

Human Health Risk Assessment for the Open Burn/Open Detonation Operation at McCormick Selph, Inc., Hollister, Ca. (June 2003)

Air Quality and Human Health Risk Assessment for the Royal Oaks Industrial Complex, Monrovia, Ca. (January 2003)

Human Health Risk Assessment and Indoor Vapor Intrusion Assessment for the former Pt. St. George Fisheries Site, Santa Rosa, Ca. (October 2002)

Human Health Risk Assessment for the former Sargent Industries Site, Huntington Park, Ca. (July 2001)

Ballard Canyon Air Pathway Analysis and Human Health Risk Assessment, Santa Barbara County, Ca. (September 2000)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca.
(March, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawai'i (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (March 1993)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Cancer Risk Assessment for the H-Power Generating Station, Campbell Industrial Park, Oahu, Hawai'i (1988)

Infrastructure Security

For the past three years, Dr. Greenberg has been trained by and is working with the Israeli company SB Security, LTD, the most experienced and tested security planning and service company in the world. Since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments and power plant security programs for the California Energy Commission (CEC). In taking the lead for this state agency, Dr. Greenberg has

interfaced with the California Terrorism Information Center (CATIC) and provided analysis, recommendations, and testimony at CEC evidentiary hearings regarding the security of power plants within the state. These analyses include the preparation of vulnerability assessments and off-site consequence analyses addressing the use, storage, and transportation of hazardous materials, recommendations for security to reduce the threat from terrorist activities, perimeter security, site access by personnel and vendors, personnel background checks, management responsibilities for facility security, and employee training in security methods. Dr. Greenberg is the lead person in developing a model power plant security plan, vulnerability assessment matrix, and a security training manual for the CEC. The model security plan will be used by all power plants in California as guidance in developing and implementing security measures to reduce the vulnerability of California's energy infrastructure to terrorist attack. He has testified at several evidentiary hearings for the CEC on power plant security issues. He has also led an audit team conducting safety and security audits at power plants throughout California that are under the jurisdiction of the CEC. In addition to providing security expertise to the State of California, Dr. Greenberg is Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Sites with RWQCB and/or DTSC Oversight

Dr. Greenberg has specific experience in assessing human health and ecological risks at contaminated sites at the land/water interface, including petroleum contaminants, metals, mercury, and VOCs at several locations in California including Oxnard, Richmond, Avila Beach, Mare Island Naval Shipyard, San Diego, Hollister, San Francisco, Hayward, Richmond, the Port of San Francisco, and numerous other locations. He has used Cal/EPA methods, US EPA methods, and ASTM Risk Based Corrective Action (RBCA) and Cal/Tox methodologies. He is extremely knowledgeable about SWRCB and SF Bay RWQCB regulations on underground storage tank sites and with ecological issues presented by contaminated sediments including sediment analysis, toxicity testing, tissue analysis, and sediment quality objectives. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Dr. Greenberg experience on many of these contaminated sites has been as a consultant to local governments, state agencies, and citizen groups. He assisted the City and County of San Francisco in developing local ordinance requiring soil testing (Article 20, Maher ordinance) and hazardous materials use reporting (Article 21, Walker ordinance). He served as the City of San Rafael's consultant to provide independent review and evaluation of the site characterization and remedial action plan prepared for a former coal gasification site. He was a consultant to a citizen group in northern California regarding exposure and risks due to accidental releases from a petroleum refinery and assisted in the assessment of risks due to crude petroleum contamination of a southern California beach. He has prepared a number of risk assessments addressing crude petroleum, diesel and gasoline contamination, including coordinating site investigations, environmental monitoring, and health risk assessment for the County of San Luis Obispo regarding Avila Beach subsurface petroleum contamination. That high-profile project lasted for over one year and Dr. Greenberg managed a team of experts with a budget of $750,000. Another high-profile project included the preparation of an extensive comprehensive human and ecological risk assessment for the Hawaii Office of Space Industry on rocket launch impacts and transportation/storage of rocket fuels at the southern end of the Big Island of Hawaii. Dr. Greenberg's risk assessments were part of the EIS for the project. Dr. Greenberg also worked on

another high-profile project conducting Air Pathway Analysis of off-site and on-site impacts from landfill gas constituents, including indoor and outdoor air measurements, air dispersion modeling, flux chamber investigations, and health risk assessment for the County of Santa Barbara.

Dr. Greenberg has conducted RI/FS work, prepared health risk assessments, evaluated hazardous waste sites and hazardous materials use at numerous locations in California, Hawaii, Oregon, Minnesota, Michigan, and New York. He has considerable experience in the development of clean-up standards and the development of quantitative risk assessments for site RI/FS work at CERCLA sites, as well as site closures, involving toxic substances and petroleum hydrocarbon wastes. He is experienced in working with both Region IX EPA and the State of California DTSC in negotiating clean-up standards based on the application of both site-specific and non site-specific health and ecological based clean-up criteria. He has significant experience in the development of site chemicals of concern list, quantitative data quality levels, site remedial design, the site closure process, the design and execution of data quality programs and verification of data quality prior to its use in the decision making process on large NPL sites.

Examples

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)
The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment, Ecological Screening Evaluation, and Development of Proposed Remediation Goals for the Flair Custom Cleaners Site, Chico, California (January 1996)

Human Health Risk Assessment for the X-3 Extrudate Project at Criterion Catalyst, Pittsburg, Ca. (November 1994)

Screening Health Risk Assessment and Development of Proposed Soil Remediation Levels at Hercules Plant #3, Culver City, Ca. (July 1993)

Ecological Screening Evaluation for the Altamont Landfill, Alameda County, Ca. (June, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawaii (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (March 1993)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca.
(March, 1993)

Screening Health Risk Assessment for the Proposed Expansion of the West Marin Sanitary Landfill, Point Reyes Station, Ca.
(March, 1993)

Health Risk Assessment for the Proposed Expansion of the Forward, Inc. Landfill, Stockton, Ca.
(September 14, 1992)

Health Risk Assessment for the Rincon Point Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency.
(August 10, 1992)

Health Risk Assessment for the South Beach Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency.
(August 10, 1992)

Screening Health Risk Assessment and Development of Proposed Soil and Groundwater Remediation Levels, Kaiser Sand and Gravel, Mountain View, Ca. Prepared for Baseline Environmental Consulting (January 30, 1992)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Preliminary Health Risk Assessment for the City of Pittsburg Redevelopment Agency, Pittsburg, California (May 29, 1991)

Military Bases

Dr. Greenberg has experience in conducting assessments at DOD facilities, including RI/FS work, preparation of health risk assessments, evaluation of hazardous waste sites and hazardous materials use at the following Navy sites in California: San Diego Naval Base; Marine Corps Air-Ground Combat Center, 29 Palms; Mare Island Naval Shipyard, Vallejo; Treasure Island Naval Station, San Francisco, Hunters Point Naval Shipyard, San Francisco, and the Marine Corps Logistics Base, Barstow. He worked with the U.S. Navy and the U.S. EPA in the implementation of Data Quality Objectives (DQO's) at MCLB, Barstow.

Examples

Review and Evaluation of the Remedial Investigation Report and Human Health Risk Assessment for the U. S. Naval Station at Treasure Island, Ca. (June 1999)

Screening Health Risk Assessment for the Proposed San Francisco Police Department's Helicopter Landing Pad at Hunters Point Shipyard, San Francisco, Ca. (September 1997)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Health Risk Assessment for the Chrome Plating Facility, Mare Island Naval Shipyard, Vallejo, California (October 24, 1988)

Background Levels and Health Risk Assessment of Trace Metals present at the Naval Petroleum Reserve No.1, 27R Waste Disposal Trench Area, Lost Hills, California (August 12, 1988)

RCRA Facility Investigation (RFI) Work Plan of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 14, 1989)

Hazardous Waste and Solid Waste Audit and Management Plan, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (July 3, 1989)

Water Quality Solid Waste Assessment Test (SWAT) Proposal RCRA Landfill, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (October 31, 1988)

Waste Disposal Facilities, Waste Haulers, Waste Recycling Facilities Report, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 22, 1988)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Air Quality Solid Waste Assessment Test (SWAT) Proposal, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 25, 1988)

Occupational Safety and Health/Health and Safety Plans/Indoor Air Quality

Dr. Greenberg has significant experience in occupational safety and health, having directed the development, adoption, and implementation of over 50 different Cal/OSHA regulations, including airborne contaminants (>450 substances), lead, asbestos, and worker-right-to-know (MSDSs). He has conducted numerous occupational health surveys and has extensive experience in the sampling and analysis of indoor air quality at residences, workplaces, and school classrooms.

Examples

Preliminary Report on Indoor Air Quality in Elementary School Portable Classrooms, Marin County, Ca. (December 1999)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Air Pathway Analysis for the Ballard Canyon Landfill,. Submitted to the County of Santa Barbara, (March 1999)

Review and Evaluation of the Health Risk Assessment for Outdoor and Indoor Exposures at the Former Golden Eagle Refinery Site, Carson, Ca. (May 1998)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)
The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Determination of Occupational Lead Exposure at a Tire Shop in Placerville, Ca. (April 1993)

Development of an Environmental Code of Regulations for Hazardous Waste Treatment Facilities on La Posta Indian Tribal lands, San Diego County, Ca. (August 1992)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Hazardous Materials Assessments, Waste Management Assessments, Worker Safety and Fire Protection Assessments, and Public Health Impacts Assessments

Dr. Greenberg also has significant experience as a consultant and expert witness for the California Energy Commission providing analysis, recommendations, and testimony in the areas of hazardous materials management, process safety management, waste management, worker safety and fire protection, and public health impacts for proposed power plant/cogeneration facilities. These analyses include the evaluation and/or preparation of the following:

- Off-site consequence analyses of the handling, use, storage, and transportation of hazardous materials,
- Risk Management Plans (required by the Cal-ARP) and Business Plans (required by H&S Code section 25503.5),

- Safety Management Plans (required by 8 CCR section 5189),
- Natural gas pipeline safety,
- Solid and hazardous waste management plans,
- Phase I and II Environmental Site Assessments,
- Construction and Operations Worker Safety and Health Programs,
- Fire Prevention Programs,
- Human health risk assessment from stack emissions and from diesel engines, and
- Mitigation measures to address PM exposure, including diesel particulates

Examples

- San Francisco Energy Reliability Project, San Francisco, Ca. 2004-present. Hazardous materials management, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Malburg Generating Station Project, City of Vernon, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Blythe II, Blythe, Ca. 2002-3. hazardous materials, worker safety/fire protection,
- Palomar Energy Center, Escondido, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Project, Rancho Seco, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Project, Tesla, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- San Joaquin Valley Energy Center, San Joaquin, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management
- Morro Bay Power Plant, Morro Bay, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Potrero Power Plant Unit 7, San Francisco, Ca., 2001-2: hazardous materials, worker safety/fire protection
- El Segundo Power Redevelopment Project, El Segundo, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Rio Linda Power Project, Rio Linda, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Pastoria II Energy Facility Expansion, Grapevine, Ca., 2001: hazardous materials, worker safety/fire protection
- East Altamont Energy Center, Byron, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Magnolia Power Project, Burbank, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Russell City Energy Center, Hayward, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Woodbridge Power Plant, Modesto, Ca., 2001: hazardous materials, worker safety/fire protection, waste management
- Colusa Power Plant Project, Colusa County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health

- Valero Refinery Cogeneration Project, Benicia, Ca., 2001: hazardous materials, worker safety/fire protection
- Ocotillo Energy Project, Palm Springs, Ca., 2001: hazardous materials, worker safety/fire protection
- Gilroy Energy Center Phase II Project, Gilroy, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Los Esteros Critical Energy Facility, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Roseville Energy Facility, Roseville, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Spartan Power, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- South Star Cogeneration Project, Taft, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Plant, Eastern Alameda County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tracy Peaker Project, Tracy, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Henrietta Peaker Project, Kings County, Ca., 2001: hazardous materials, worker safety/fire protection, waste management, public health
- Central Valley Energy Center, San Joaquin, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Plant, Rancho Seco, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Los Banos Voltage Support Facility, Western Merced County, Ca., 2001-2: waste management, public health
- Palomar Energy Project, Escondido, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Metcalf Energy Center, San Jose, Ca., 2000-1: hazardous materials
- Blythe Power Plant, Blythe, Ca., 2000-1: hazardous materials
- San Francisco Energy Co. Cogeneration Project, San Francisco, Ca., 1994-5: hazardous materials
- Campbell Soup Cogeneration Project, Sacramento, Ca., 1994: hazardous materials
- Proctor and Gamble Cogeneration Project, Sacramento, Ca., 1993-4: hazardous materials
- San Diego Gas and Electric South Bay Project, Chula Vista, Ca., 1993: hazardous materials
- SEPCO Project, Rio Linda, Ca., 1993: hazardous materials
- Shell Martinez Manufacturing Complex Cogeneration Project, Martinez, Ca., 1993: hazardous materials and review and evaluation of EIR

DECLARATION OF
SHAELYN STRATTAN

I, **SHAELYN STRATTAN,** declare as follows:

1. I am presently employed at the California Energy Commission, in the **ENVIRONMENTAL OFFICE** of the Energy Facilities Siting Division, as a **PLANNER II.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **LAND USE** for the **Russell City Energy Center Project Amendment No. 1,** based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 29, 2007 Signed: Shaelyn Strattan

At: Sacramento, California

RESUME
Shaelyn Strattan

WORK EXPERIENCE

1. Current Position: Environmental Planner (Classification: Planner II)

From: November 2006 - Present
California Energy Commission – Energy Facilities Siting Division/Environmental Office

General Responsibilities

Identify, describe, and analyze complex environmental issues related to the construction and operation of electrical energy production facilities, transmission corridors, alternative energy technologies, energy research and development, and Commission programs and policies. Prepare components of Staff Analyses to comply with CEQA (EIR functional equivalent). Prepare and present Commission reports and expert technical testimony. Coordinate and work with applicants; federal, regional, and local governments; state agencies; community and environmental organizations; and the general public to provide project information and insure public input on Commission projects. Provide technical research and expertise for Commission programs to integrate energy issues into land use, climate change, and transportation plans and programs. Lead or participate in workshops, seminars, and meetings among project applicants, staff, other government agencies, private organizations, consultants, and the public. Evaluate and comment on proposed legislation and its effect on on-going and future energy projects.

2. Position: Senior Planner (Classification: Planner III)

From: February 2005 – November 2006
Calaveras County Community Development Agency - Planning Department

General Responsibilities

Primary Duties: Planning and evaluation of rezoning, property division, location and operation of utility production and transmission facilities, conditional use permits, variances, and other land use projects; environment review (CEQA/NEPA); complex project review (large subdivisions, utility-related issues, or projects requiring substantial mitigation or an EIR); interdepartmental coordination with Responsible and Trustee agencies and Native American tribal representatives to establish working procedures and resource evaluation/protection guidelines; EIR project manager and contract manager for outside consultants (EIR, natural and cultural resource studies, and peer reviews); preparation/review of resource ordinances (oak woodland; dark sky); review and approval of oak replacement and conservation plans; preparation/coordination of conservation and utility easements; project presentations to the Planning Commission and Board of Supervisors; supervision of Planner I and II positions, including training and assistance w/project reviews.

Secondary Duties: Interpret General Plan policies, zoning codes, and CEQA requirements in coordination with County Counsel; develop procedural manuals and report/evaluation templates; revise/update County CEQA Guidelines; participate in committees to develop a Voluntary Oak Woodlands Management Plan, County/DFG CEQA procedures, inclusionary housing goals, and guidelines for conservation easements and oak mitigation bank funding; review annual Williamson Act revisions w/Agricultural Department and implement associated zoning changes; review and approve mining use permits, reclamation plans, financial assurances, and annual mining inspections and reports. Work directly with Dept. of Fish & Game and US Fish & Wildlife to develop standardized county-wide mitigation measures and identify "red flag" development issues for sensitive species. Coordinate environmental review for transportation and utility-related projects, including hazardous materials routing, and adequacy of electric production and transmission systems, water treatment, and waste treatment facilities.

3. Position: Associate Environmental Planner

From: Jan 2005 - Feb 2005
Governor's Office of Emergency Services
Disaster Assistance Division - Hazard Mitigation Section (Technical Assistance)

General Responsibilities

- Coordinate hazard mitigation activities for disaster recovery projects statewide, provide disaster recovery and mitigation planning and educational activities, and provide technical assistance during and following disasters within California. This includes evaluation of proposed restoration and reconstruction projects for feasibility; potential environmental impacts, and compliance with OES and FEMA funding requirements. Identify effective mitigation measures to reduce environmental impacts to the greatest extent possible, while accomplishing the primary goal of community disaster recovery.

- Evaluate and comment on projects and associated CEQA documents submitted by state and local agencies for potential environmental impacts and appropriateness of mitigation measures associated with California Emergency Disaster laws, regulations, policies, and practices.

4. Position: Environmental Planner/Project Manager (Classification: Associate Park and Recreation Specialist)

From: Jan 2001 - Jan 2005
California Department of Parks and Recreation (California State Parks)
Acquisition and Development Division - Northern Service Center

General Responsibilities

- Coordinate the environmental review for DPR's Major Capital Outlay, Minor Capital Outlay, and Accessibility programs with Service Center and district staff. Consult with project managers, designers, and environmental specialists to refine project scope and identify potentially significant adverse environmental impacts for park projects in Northern and Central California. (Project elements included design review of structures; adequacy and availability of electrical transmission corridors, water and waste treatment facilities, road and trail access; public accessibility; compliance with federal, state, and local laws, ordinances, regulations, and statutes; and resource impacts.) Determine level of environmental compliance required and prepare, circulate, and file accurate, comprehensive, and legally defensible environmental documents, in compliance with federal, state, and local environmental laws and regulations, including the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Coordinate with federal agencies (National Park Service, U.S. Army Corps of Engineers, U.S. Fish & Wildlife Service, National Transportation Board, etc.) to address resource concerns, permitting, and federal grant requirements. Work directly with resource specialists to identify at-risk natural and cultural resources and to develop feasible and enforceable mitigation measures. Evaluate public and governmental comments on projects, respond to comments, and incorporate necessary changes into final documents, as mandated by law.

- Participate as a member of the planning team developing General Plans (GPs) for State Park units. Prepare the environmental impact analysis for the draft GPs prepared in-house. Oversee and approve development and preparation of environmental analysis and supporting environmental documents, when prepared by outside consultants.

- Prepare application(s) for project-specific state and federal environmental permits and coordinate preparation of associated supporting documents. Consult with permitting agencies as necessary to clarify information and expedite the permitting process.

- Prepare grant proposals, applications, and supporting documents for project-related federal funding.

- Participate as a member of the planning team to determine location, design, and scope of work for Major and Minor Capital Outlay projects. Develop budget estimates and determine probable environmental review requirements.

Primary Duties as Supervising Lead - Environmental Coordinators / Northern & Central Service Centers

- Review and edit environmental documents prepared by service center environmental coordinators (SCECs) at the Northern and Central Service Centers. Advise and direct staff during project review and document preparation process.

- Prepare employee workplans and make project assignments, subject to approval by Resources Section Manager.

- Provide training to field and division personnel in processing and compliance requirements for environmental documents; provide OJT for new employees with CEQA-related duties.

- Review environmental documents prepared by non-departmental entities to determine the potential impact on ongoing or proposed projects or programs. Prepare comments identifying potential impacts to the department's interests and/or effectiveness of proposed mitigation.

- Review and comment on pending legislation, as it relates to environmental issues, CEQA/NEPA, and Departmental policy/procedures.

- Serve on interview panels for selection of new Environmental Coordinators.

- Consult on probation evaluations; provide documentation for adverse actions or dismissal, if necessary.

- Serve as liaison with DPR Legal Counsel regarding interpretation of CEQA compliance requirements and with Attorney General's Office regarding legal challenges of environmental documents prepared by the Northern and Central Service Centers and their associated Districts. Prepare administrative record and other supporting documents, and assist in the preparation of legal briefs and other applicable court documents.

- Work with GIS contract specialists to develop interactive database incorporating natural and cultural resource data and CEQA/NEPA evaluation and document requirements.

Primary Duties as Statewide Environmental Coordinator (January 2002 - June 2003)

- Foster statewide consistency and improve Departmental compliance with CEQA, NEPA, and other environmental laws, policies, and regulations. Develop standardized formats and guidelines from the preparation of environmental documents.

- Develop and coordinate a standardized CEQA review process and establish criteria for evaluating project impacts and environmental compliance documents.

- Provide training for District and Service Center personnel involved in the preparation and processing of environmental documents. Develop training support materials. Conduct CEQA seminars at California Trails and Greenways Conference (September 2002 & 03) and Resource Ecologists' In-Service Training Seminar (2002).

- Act as Service Center liaison with the Environmental Stewardship Section of the Natural Resources Division regarding the effectiveness and improvement of the environmental review process.

5. Position: Legislative Analyst/Press Liaison

From: Nov. 20, 2000 - Jan. 11, 2001
California Office of Environmental Health Hazard Assessment

General Responsibilities

- Respond to requests from news media for information and interviews.
- Assist Deputy Director in monitoring legislative bills and press reports relating to OEHHA projects and research.
- Attend public hearings and committee meetings as Division representative and provide evaluation of public response and comments.
- Research, write, and/or edit technical documents, presentations, and related materials, with special emphasis on writing for a general readership. These documents include legislative bill analyses; Requests for Proposals; BCPs; responses to public inquiries; consumer guidelines and fact sheets; articles for magazines and technical journals; brochures; webpage information (both internal and external); and briefing documents. Evaluate suitability of documents for publication.

6. Position: Research Writer

From: Nov. 24, 1998 - Nov. 16, 2000
California Air Resources Board - Research Division

General Responsibilities

Research, write, and/or edit technical documents, presentations, and related materials, with special emphasis on scientific and environmental writing for a general readership. These documents include Requests for Proposals; responses to public inquiries; consumer guidelines and fact sheets; articles for magazines and technical journals; brochures; webpage information (both internal and external); legislative bill analyses; briefing documents; proposals; and Board presentations and agenda items. Evaluate suitability of documents for publication.

7. Job Title: Owner and Operator of *The Wordworker*

From: May 1987 - November 1999

General Responsibilities

Professional writer, editor, and researcher. Work included narratives (including voice-overs), scripting, copy editing, transcription, and technical writing; proposals (grants, bids, and new business); legal briefs (environmental and family law); training and teacher's manuals; desktop publishing (brochures, newsletters, flyers, etc.); and adaptation of scientific information for general readership. Research, draft, review/edit, and comment on CEQA/NEPA environmental documents; coordinate preparation of materials among project scientists, lead and responsible agencies, and applicants. Promotional consultant and press liaison for several non-profit fundraisers, seminars, and symposiums:

Other Significant Related Job Experience

1973-74	Engineering Aid – Nuclear Power Plant Siting Division (Site evaluation and monitoring) Tennessee Valley Authority (Alabama & Tennessee)
1975-1981	Air Traffic Control Specialist (Federal Aviation Administration) Certified Weather Observer (National Weather Service)

General Information

U.S. Citizen - Born in Boulder City, Nevada
Veteran - U.S. Air Force Aircraft Control and Warning Operator - Honorable Discharge

EDUCATION

Highest Level Completed: Equivalent to Bachelor Degree

San Juan High School — High School Diploma - 1967
Citrus Heights, California

BA Equivalent (judged equivalent to BA at time of hiring for various positions, including current classification; all units awarded by accredited colleges or universities). Over 114 total semester/quarter units in Journalism/Communication, Advertising, Technical/Non-Fiction Writing, Computer Science, Business Law, Natural Resources, Environmental Studies (including Environmental Chemistry), Land Use Planning, Geography, Geology, Architecture, Interior Design, and Small Business Management a between 1968-2002,

Technical and Job-Related Training

National Weather Service — 160-hour Certification Training - Meteorology
Oklahoma City, Oklahoma — Weather Observer (Certified 1976-82)

American River College — Completed courses for Technical Writing
Sacramento, California — Certificate (18 units) - 1992

Completed the following job-related coursework at UC Davis between 2000-present:

- The California Environmental Quality Act: A Step-by-Step Approach
- Successful CEQA Compliance: An Intensive 2-day Seminar
- NEPA: Policy, Terminology, and FAQs
- EIR/EIS Preparation and Review
- CEQA Update, Issues, and Trends
- CEQA Advanced Workshop (every year since 2000)
- Updating General Plans and Preparing Specific Plans
- Practical Guide to Updating the General Plan
- Making Effective Use of Mitigated Negative Declarations
- Developing Effective Mitigation and Monitoring Plans
- Mitigation Measure Development and Monitoring
- Thresholds of Significance in Environmental Planning
- Environmental Compliance (2-day course)
- Airports and Land Use Compatibility Planning
- Subdivision Map Act (2-day course)
- Property Rights and Land Use Regulations
- GIS for Resource Managers and Professionals
- Climate Change: Is this a New Age for Land Use Planning and CEQA?
- Role of the Planning Commissioner
- Annual Land Use Review and Update (2002-06)

Numerous job-related workshops, seminars, and conferences, including:

- Sustainable Housing Alternatives
- Watershed and Stormwater Management
- Cultural Landscapes Workshop (California Preservation Foundation)
- CEQA Legislative Updates
- 2002 & 2005 CalifAEP Conferences
- 2005 CCAPA Conference – Yosemite
- 2004 California Preservation Foundation/NTHP Conference – San Francisco
- 2002 & 2003 California Trails and Greenways Conference (Presenter – CEQA/NEPA Compliance)

DECLARATION OF
Steve Baker

I, **Steve Baker,** declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Energy Facilities Siting Division as a **Senior Mechanical Engineer**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Noise and Vibration** for the **Russell City Energy Center Project Amendment No.** 1 based on my independent analysis of the Application, supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 18, 2007 Signed: Steve Baker

At: Sacramento, California

DECLARATION OF
Amanda Stennick

I, **Amanda Stennick** declare as follows:

1. I am presently employed by the California Energy Commission in the **Environmental Office** of the Systems Assessments and Facilities Siting Division as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **SOCIOECONOMICS RESOURCES**, for the **RUSSEL CITY ENERGY CENTER Amendment** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 12, 2007 Signed: Amanda Stennick

At: Sacramento, California

DECLARATION OF
RICHARD LATTERI

I, Richard Latteri declare as follows:

1. I am presently employed at the California Energy Commission, in the Environmental Office of the Energy Facilities Siting Division as a Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the Soil and Water Resources, for the Russell City Energy Center Project Amendment No. 1 based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Richard Latteri Signed: 3/30/07

At: Sacramento, California

RESUME

Richard W. Latteri

System Assessment & Facilities Siting Division
California Energy Commission
1516 Ninth Street, MS 40
Sacramento, CA 95814
(916) 651-8859

PROFESSIONAL EXPERIENCE:

2001-Present ***California Energy Commission – Planner II:*** Technical specialist with the Environmental Office providing analysis of water and soil resources for proposed energy facilities. Specific tasks include the analysis of potential impacts, identification of suitable mitigation measures, preparation of testimony, and project monitoring to ensure compliance with applicable requirements.

1993-2001 ***Department of Water Resources – Senior Electric Utilities Engineer:*** Chief, Power Cost Allocation Section with the State Water Project Analysis Office responsible for the supervision of technical staff in the determination and allocation of State Water Project power costs per the provisions of the Water Supply Contract with DWR's twenty-nine long-term State Water Contractors.

1989-1993 ***Department of Water Resources – Senior Electric Utilities Engineer:*** Chief, Electric System Planning Section with both the Energy Division and State Water Project Analysis Office responsible for supervising, planning and directing staff in the analysis of future generation and transmission requirements for the State Water Project.

1981-1989 ***Department of Water Resources – Electric Utilities Engineer /Engineer Water Resources:*** Performed both civil and electric utilities engineering duties in the areas of power plant construction management and as an electricity resource planner conducting supply and demand analyses for the State Water Project.

EDUCATION AND RELEVANT TRAINING

Bachelor of Science, Civil Engineering, California State University, Sacramento
Engineer Officer Course, U. S. Army Engineer School, Fort Belvoir, Virginia

DECLARATION OF
JAMES ADAMS

I, **JAMES ADAMS** declare as follows:

1. I am presently employed by the California Energy Commission in the **ENVIRONMENTAL OFFICE** of the Energy Facilities Siting Division as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **TRAFFIC AND TRANSPORTATION**, for the **RUSSELL CITY ENERGY CENTER** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 15, 2007 Signed: James Adams

At: Sacramento, California

James S. Adams, M.A.
California Energy Commission
1516 9th Street, MS 40
Sacramento, CA 95814
(916) 653-0702
jadams@energy.state.ca.us

5/1999
Present **Environmental Planner II**
Review applications for certification to acquire permits from the California Energy Commission to build electric generating power plants. Specific technical fields include socioeconomics, traffic and transportation, land use and visual resources. Work on special projects as requested.

11/1997
Present **Energy and Resource Consultant**
Provide clients with technical expertise on various issues related to natural resource use and development. Current activities include managing an intervention by the Surfrider Foundation before the California Public Utilities Commission regarding decommissioning issues concerning Humboldt Bay, Diablo Canyon and San Onofre nuclear reactors.

9/1994--
10/1997 **Senior Analyst - Safe Energy Communication Council (SECC)**
Responsible for developing and/or implementing campaigns on various energy issues involving the promotion of energy efficiency and renewable energy and advocating less reliance on nuclear power. Managed educational outreach efforts to newspaper editorial writers throughout the U.S. to encourage coverage of energy issues. Participated in meetings and negotiations with key Clinton administration officials, members of Congress and staff, national coalitions, and grassroots organizations on important energy issues (e.g. U.S. Department of Energy Budget for Fiscal Years 1996-1998). Successfully raised $140,000 from private foundations to support SECC activities.

6/1978--
12/1992 **Principal Consultant - Redwood Alliance**
Provided consulting services to the Alliance; a renewable energy/political advocacy organization. Major responsibilities included managing and/or participating in several interventions/appearances before the California Public Utilities Commission, California Energy Commission, California Legislature, U.S. Congress and the U.S. Nuclear Regulatory Commission. Issues included electric utility planning options, greater reliance on energy efficiency and renewable energy, nuclear power economic analyses, decommissioning cost estimates, and nuclear waste management and disposal.

2/1983--
8/1986 **Natural Resource Specialist**
Assisted private consulting, firms, non-profit corporations and government agencies in various projects related to the enhancement and protection of national forests in Northern California and Southern Oregon. This included contracts with the U.S. Forest Service, Fish and Wildlife Service, National Park Service, the California Coastal Conservancy, and private landowners.

6/1978--
present Consultant/Journalist/Paralegal/Lobbyist
Throughout the period of work outlined above, I have written a considerable amount of news articles and reports connected to ongoing-projects and issues of personal interest. The leg, al/administrative interventions have required extensive paralegal work to support attorneys, and technical expertise to identify and assist consultants. In addition, many of the projects required consulting services and lobbying, at the local, state and federal level whenever necessary, as well as working with the print and television media as appropriate.

From 1978 through 1984 I served on the Board of Directors for two locals non-profit agencies devoted to sustainable community development, Redwood Community Development Council and Redwood Community Action Agency (RCAA). I also was hired on staff at RCAA as a natural resource specialist which is explained more fully above. I am proficient with computers, printers, fax machines and related equipment.

EDUCATION

M.A. Social Science. Political science and natural resources emphasis. California State University at Humboldt. Graduated December 1988.

B.A. Political Science. Political and economic aspects of natural resource development, with a particular emphasis in forest ecology and appropriate technology. California State University at Humboldt. Graduated June 1978.

Academic
Honors. Member of PI GAMMU MU Honor Society since 1986.

MILITARY SERVICE

7/1969--
9/1975 U.S. Navy. Air Traffic Controller.
Honorable Discharge.

DECLARATION OF
Dr. Obed Odoemelam

I, **Obed Odoemelam** declare as follows:

1. I am presently employed at the California Energy Commission, in the Environmental Office of the Energy Facilities Siting Division as a Staff Toxicologist

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the Transmission Line Safety and Nuisance section for the Russell City Energy Center Project Amendment No. 1 based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 28, 2007 Signed: Odoemelam

At: Sacramento, California

RESUME

DR. OBED ODOEMELAM

EDUCATION:

1979-1981 University of California, Davis, California. Ph.D., Ecotoxicology

1976-1978 University of Wisconsin, Eau Claire, Wisconsin. M.S., Biology.

1972-1976 University of Wisconsin, Eau Claire, Wisconsin. B.S., Biology

EXPERIENCE:

1989
The Present: California Energy Commission. Staff Toxicologist.

Responsible for the technical oversight of staffs from all Divisions in the Commission as well as outside consultants or University researchers who manage or conduct multi-disciplinary research in support of Commission programs. Research is in the following program areas: Energy conservation-related indoor pollution, power plant-related outdoor pollution, power plant-related waste management, alternative fuels-related health effects, waste water treatment, and the health effects of electromagnetic fields. Serve as scientific adviser to Commissioners and Commission staff on issues related to energy conservation. Serve on statewide advisory panels on issues related to multiple chemical sensitivity, ventilation standards, electromagnetic field regulation, health risk assessment, and outdoor pollution control technology. Testify as an expert witness at Commission hearings and before the California legislature on health issues related to energy development and conservation. Review research proposals and findings for policy implications, interact with federal and state agencies and industry on the establishment of exposure limits for environmental pollutants, and prepare reports for publication.

1985-1989 California Energy Commission.

Responsible for assessing the potential impacts of criteria and noncriteria pollutants and hazardous wastes associated with the construction, operation and decommissioning of specific power plant projects. Testified before the Commission in the power plant certification process, and interacted with federal and state agencies on the establishment of environmental limits for air and water pollutants.

1983-1985 California Department of Food and Agriculture.

Environmental Health Specialist.

Evaluated pesticide registration data regarding the health and environmental effects of agricultural chemicals. Prepared reports for public information in connection with the eradication of specific agricultural pests in California.

DECLARATION OF

Mark R. Hamblin

I, Mark R. Hamblin declare as follows:

I am presently employed by the California Energy Commission in the Environmental Protection Office of the Energy Facilities Siting Division as a Planner II.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I helped prepare the Visual Resources section in the Petition To Amend The Commission Decision No. 1 for the Russell City Energy Center based on my independent analysis and supplement(s) thereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 25, 2007 Signed: [illegible]

At: Sacramento, California

MARK R. HAMBLIN

Summary

Public administrator/land use planner with 15 years experience addressing land use development matters of concern to citizens and government leaders. Expertise in interpreting public policy pertaining to land use and environmental assessment. Demonstrated ability in working with individuals, and on teams involved in the development permitting process.

Professional Experience

California Energy Commission, Sacramento, CA.
Planner II November 2000 to present.
Prepares an independent technical analysis in the area(s) of land use, traffic & transportation, and visual resources to inform interested persons and to make recommendations to the Energy Commission regarding the consequences of a natural gas fired power generation plant proposal; reviews information provided by the applicant and other sources to assess the environmental effects of a proposal as required by the California Environmental Quality Act (CEQA), and the California Energy Commission siting regulations; evaluates project in accordance with federal, state and local laws, ordinances, regulations, standards (LORS); coordinates proposal with federal, state and local agencies; conducts field studies; oversees technical consultant(s); participates in public workshop(s) on proposal; presents sworn testimony during evidentiary hearings; implements compliance monitoring programs for projects approved by the Energy Commission to ensure that power plants are constructed and operated according to the conditions of certification of their license.

Yolo County Planning and Public Works Department, Woodland, CA.
Associate Planner June 1992 to October 2000.
Advised and assisted individuals in the processing of land use requests (general plan amendments, conditional use permits, subdivision maps, etc.); reviewed information provided by the applicant and other sources for consistency with the state zoning and planning law, the county General Plan, the county government code, and the requirements of the CEQA; collected and analyzed information pertaining to a land use request and presented it in a staff report for consideration by the county planning commission and/or county board of supervisors; board of supervisors liaison, and planning department staff person to citizen and inter-agency committees (county airport advisory committee, county habitat conservation plan steering committee, and community general plan citizen advisory committee(s); drafted zoning ordinances and regulations; prepared environmental assessment documents in accordance with CEQA and NEPA (National Environmental Protection Act); hired and supervised consultants; executed county zoning administrator duties; conducted zone code enforcement; reviewed building plans for issuance of permits; answered questions at the public counter, or on the telephone regarding land use issues and development proposals in the County.

Yolo County Community Development Agency, Woodland, CA.
Assistant Planner January 1991 to June 1992.
Advised and assisted individuals in the processing of land use requests; reviewed information provided by the applicant and other sources for consistency with the county

General Plan, the state and county government code, and the requirements of CEQA; collected and analyzed information pertaining to a land use request and presented it in a staff report for consideration by the county planning commission; drafted zoning ordinances; prepared environmental assessment documents in accordance to the CEQA; supervised consultants; conducted zone code enforcement; reviewed building plans for issuance of permits; answered questions at the public counter, or on the telephone regarding land use and development in the County.

Tulare County Planning and Development Department, Visalia, CA.
Planning Technician II March 1988 to January 1990.
Advised and assisted individuals in the processing of land use requests, specifically special-use permits, variances, parcel and subdivision maps; reviewed information provided by the applicant and other sources for consistency with the county General Plan, the state and county government code, and the requirements of CEQA; collected and evaluated information for presentation in a staff report on the proposed land use request for consideration by the county zoning administrator, site plan review committee, or planning commission; prepared environmental assessment documents in accordance with CEQA; conducted zone code enforcement; reviewed building plans for issuance of permits; answered questions at the public counter, or on the telephone regarding land use and development in the County.

Education

University of California, Davis Extension. Coursework in California Land Use Planning and the California Environmental Quality Act 1988 to 1995.
Cosumnes River College. Coursework in Television and Radio Broadcasting1990 to 1991.
California State University, Bakersfield. Master of Public Administration; August 1988. Concentration in Public Policy. Coursework in Business Administration and Political Science.
California State University, Sacramento. Bachelor of Science in Public Administration; May 1984. Concentration in Human Resources Management.
Porterville College. Associate in Arts Social Science; May 1982. Coursework in Administration of Justice.

Awards

2001 Superior Accomplishment Award - Recognition of outstanding performance and contribution as a Team Member of the “21 Day, 4, 6, and 12 Month Processes Team.” California Energy Commission.

2001 Superior Accomplishment Award - Recognition of outstanding performance and contribution as a Team Member of the “Expedited 4 Month AFC/SPPE Team,”
California Energy Commission.

DECLARATION OF
Eric Knight

I, Eric Knight declare as follows:

I am presently employed by the California Energy Commission in the Environmental Protection Office of the Energy Facilities Siting Division as a Planner III.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I helped prepare the Visual Resources section in the Petition To Amend The Commission Decision No. 1 for the Russell City Energy Center based on my independent analysis and supplement(s) thereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: 6-25-07

At: Sacramento, California

ERIC KNIGHT
Senior Environmental Planner

EDUCATION

BA – Environmental Studies, California State University, Sacramento (CSUS), 1993
Minor – Government, CSUS, 1993

PROFESSIONAL EDUCATION

Managing LNG Risks, ioMosaic Corporation, November 2006
Applied Project Management, DTS Training Center, May 2006
CEQA Workshop, Association of Environmental Professionals, Feb. 2004 and 1999
CEQA Overview and Update, UC Davis Extension Program, June 1998
Land Use Planning for Environmental Professionals, UC Davis Ext., May 1996
Introduction to ArcView and Avenue (GIS), ESRI, August 1995 and May 1998

PROFESSONAL EXPERIENCE

Senior Environmental Planner (Planner III - Supervisor) 1/22/07 to present
California Energy Commission – Energy Facilities Siting Division/ Environmental Office
Responsible for supervising and directing the work of a staff of technical specialists and consultants performing analyses in the areas of power plant siting, electric transmission line corridor planning, electric transmission line licensing, electric generation resource planning, energy conservation, new energy technology development, and energy policy/planning. Responsible for completing the most complex analyses and addressing the most difficult technical issues related to the unit's responsibilities. Advise the Office Manager and Deputy Director on procedural, legislative, and technical issues.

Energy Commission Specialist II 7/23/06 to 1/19/07
California Energy Commission – Fuels & Transportation Division
Provide expert guidance on complex, sensitive, and technical problems related to energy infrastructure assessments, particularly liquefied natural gas (LNG) projects. Responsible for leading the Special Projects Office's LNG assessment activities that support Energy Commission and Governor Office policies. Responsible for briefings for management, Commissioners (Natural Gas Committee), and LNG Interagency Working Group on LNG assessment activities and projects. Responsible for preparing reports, correspondence, and presentations related to LNG proposals. Delivered a speech at a conference titled *LNG: When East Meets West - The Unfolding of the LNG Trade in the Pacific.* Identify and invite speakers to make presentations to the LNG Interagency Working Group.

Project Manager (Planner II) 11/2004 to 7/20/06
California Energy Commission – Energy Facility Siting Division/Siting Office
Responsible for the day-to-day management of electrical generating facility siting projects (and associated infrastructure, including transmission lines). Responsible for briefings for the executive director, the deputy director, the office managers and supervisors, and staff on the schedule, strategy, progress, and issues throughout the case. Provide direction to the team members assigned to the project. Editor-in-chief and publisher of all staff products produced during the siting case and responsible for ensuring quality control on all published staff products, including the staff's assessment document covering 23 environmental and engineering technical disciplines. Responsible for ensuring that staff's analysis and procedures comply with the California Environmental Quality Act (CEQA) and the Warren-Alquist Act (California Public Resources Code, Section 25500 set seq.) and the Power Plant Site Certification Regulations (Title 20, California Code of Regulations). Responsible for organizing, scheduling, and conducting public workshops and preparing correspondence related to the case. Other assignments included managing a staff paper prepared in support of the *2005 Integrated Energy Policy Report (IEPR)* titled *Environmental Issues and Opportunities in the California-Mexico Border Region;* authoring a chapter to the *2005 Energy Environmental Performance Report* in support of the *2005 IEPR;* and coordinating environmental and engineering staff's review of environmental documents prepared by federal and state agencies pursuant to the National Environmental Policy Act (NEPA) and CEQA, including the environmental assessments for the Cabrillo Port and Port of Long Beach LNG projects, and the Pine Tree Wind Development Project.

Environmental Planner (Planner I and II) 6/2000 to 11/2004 Planner II
California Energy Commission – 10/1998 to 6/2000 Planner I
Energy Facility Siting Division/Environmental Office
Technical analyst responsible for preparing environmental impact assessments (land use, traffic, and visual impacts) of electrical generating facility proposals (and associated infrastructure, including transmission lines) and identifying measures to mitigate potentially significant environmental effects. Participated in public workshops and presented expert testimony at evidentiary hearings. Monitored compliance with conditions of approval contained in Commission Decisions.

Energy Analyst/Planner I 6/1995 to 10/1998
California Energy Commission – Energy Facility Siting Div/Engineering Office
Promoted local government's use of an urban planning tool with a focus on energy efficiency. Developed a Geographical Information System (GIS) database for a community-planning project in San Diego. Authored a chapter to the National Wind Coordinating Committee's handbook *Permitting of Wind Energy Facilities.* Assisted in the preparation of several Energy Commission publications, including the *Energy Aware Planning Guide II: Energy Facilities* and *The Energy Yardstick: Using PLACE^{3}S to Create More Sustainable Communities.*

Program Technician 6/1994 to 6/1995
Student Assistant 3/1993 to 1/1994
California Department of Toxic Substances Control
Provided regulatory assistance to hazardous waste generators, transporters and storage facility operators. Compiled an instructions manual for telephone hotline staff to refer to while assisting hazardous waste handlers and the general public. Issued identification numbers to hazardous waste generators. Entered facility information into the department's database of hazardous waste handlers.

Student Intern 1/1992 to 6/1992
Sacramento Valley Toxics Campaign
Filed public record requests with state and federal agencies. Conducted research and authored an article for the campaign newsletter. Helped to organize community meetings, press conferences and public outreach events.

DECLARATION OF
Ellen Townsend-Hough

I, **Ellen Townsend-Hough** declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Siting Office of the Energy Facilities Siting Division as an Associate Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Waste Management for the Russell City Energy Center project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 6/27/07 Signed: Ellen Townsend-Hough

At: Sacramento, California

Ellen Townsend-Hough

SUMMARY

I am a chemical engineer with over 20 years of experience. My professional career has afforded me many unique growth and development opportunities. Working knowledge of the California Environmental Quality Act. Strength in analyzing and performing complex engineering analyses. Also worked as a policy advisor to a decision-maker for three years.

PROFESSIONAL EXPERIENCE

Writing

- Write letters, memos, negative declarations, environmental impact reports that require technical evaluation of mechanical engineering and environmental aspects of pollution control systems, environmental impacts, public health issues and worker safety.

Technical Analysis and Presentation

- Performs mechanical engineering analysis of designs for complex mechanical engineering analysis of designs for systems such as combustion chambers and steam boilers, turbine generators, heat transfer systems, air quality abatement systems, cooling water tower systems, pumps and control systems

- Review and process compliance submittals in accordance with the California Environmental Quality Act, the Warren Alquist Act, the Federal Clean Air Act and the California and Federal Occupational Health and Safety Acts to assure compliance of projects

- Provides licensing recommendations and function as an expert witness in regulatory hearings.

- Provide public health impact analysis to assess the potential for impacts associated with project related air toxic/non-criteria pollutant emissions.

- Evaluate the potential of public exposure to pollutant emissions during routine operation and during incidents due to accidents or control equipment failure

- Provide an engineering analysis examining the likelihood of compliance with the design criteria for power plants and also examine site specific potential significant adverse environmental impacts

Technical Skills

- Establish mitigation that reduces the potential for human exposure to levels which would not result in significant health impact or health risk in any segment of the exposed population.

- Assist with on-site audits and inspection to assure compliance with Commission decisions.

- Review and evaluate the pollution control technology applied to thermal power plants and other industrial energy conversion technologies.

- Work with the following software applications: WORD, Excel, and PowerPoint.

Policy Advisor

- Provided policy, administrative and technical advice to the Commissioner Robert Pernell. My work with the Commissioner focused on the policy and environmental issues related to the Commission's power plant licensing, research and development and export programs.

- Track and provide research on varied California Energy Commission (CEC) programs. Prepare analysis of economic, environmental and public health impacts of programs, proposals and other Commission business items.

- Represent Commissioner's position in policy arenas and power plant siting discussions.

- Write and review comments articulating commission positions before other regulatory bodies including Air Resources Board, California Public Utilities Commission, and the Coastal Commission.

- Wrote speeches for the Commissioner's presentations.

EMPLOYMENT HISTORY

2002-Present	Associate Mechanical Engineer	CEC Sacramento CA
1999-2002	Advisor to Commissioner	CEC Sacramento CA
1989-1999	Associate Mechanical Engineer	CEC Sacramento CA
1992-1993	Managing Partner	EnvironNet Sacramento CA
1988-1989	Sales Engineering Representative	Honeywell Inc Commerce CA
`1987-1988	Chemical Engineer	Groundwater Technology Torrance CA
1985-1986	Technical Marketing Engineer	Personal Computer Engineers Los Angeles CA
1985-1985	Energy Systems Engineer	Southern California Gas Company Anaheim CA
1980-1985	Design and Cogeneration Engineer	Southern California Edison Rosemead CA
1975-1980	Student Chemical Engineer	Gulf Oil Company Pittsburgh PA

EDUCATION

Bachelor of Science, Chemical Engineering
Drexel University, Philadelphia Pennsylvania

Continuing Education

Hazardous Material Management Certificate, University California Davis
Urban Redevelopment and Environmental Law, University of California Berkley
Analytical Skills, California Department of Personnel Administration (DPA) Training Center
Legislative Process/Bill Analysis, DPA Training Center
Federally Certified Environmental Justice Trainer

References furnished upon request.

DECLARATION OF
SHAHAB KHOSHMASHRAB

I, **SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Facilities Siting Division as a **MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I participated in the preparation of the staff testimonies on **FACILITY DESIGN**, **POWER PLANT EFFICIENCY**, and **POWER PLANT RELIABILITY** for the **RUSSELL CITY ENERGY CENTER** project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 12, 2007 Signed: [signature]

At: Sacramento, California

Shahab Khoshmashrab
Mechanical Engineer

Experience Summary

Nine years experience in the Mechanical, Civil, Structural, and Manufacturing Engineering fields involving engineering and manufacturing of various mechanical components and building structures. This experience includes QA/QC, construction/licensing of electric generating power plants, analysis of noise pollution, and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Sacramento-- Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California

Professional Experience

2001-2004--Mechanical Engineer, Systems Assessment and Facilities Siting– California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise and vibration, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

1998-2001--Structural Engineer – Rankin & Rankin

Engineered concrete foundations, structural steel and sheet metal of various building structures including energy related structures such as fuel islands. Performed energy analysis/calculations of such structures and produced structural engineering detail drawings.

1995-1998--Manufacturing Engineer – Carpenter Advanced Technologies

Managed manufacturing projects of various mechanical components used in high tech medical and engineering equipment. Directed fabrication and inspection of first articles. Wrote and implemented QA/QC procedures and occupational safety procedures. Conducted developmental research of the most advanced manufacturing machines and processes including writing of formal reports. Developed project cost analysis. Developed/improved manufacturing processes.

DECLARATION OF
PATRICK A. PILLING, Ph.D., P.E., G.E.

I, Patrick A. Pilling, declare as follows:

1. I am presently employed by Black Eagle Consulting, Inc. under contract with the California Energy Commission Facilities Siting and Environmental Protection Division as a Geotechnical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **GEOLOGY AND PALEONTOLOGY**, for the **Russell City Energy Center Project Amendment No. 1** based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 28, 2007 Signed: _____

At: Reno, Nevada

PATRICK A. PILLING, Ph.D., P.E., G.E.

Executive Vice President
Principal Geotechnical Engineer

Education

$ B.S. B Civil Engineering B1986 B Santa Clara University
$ M.S. B Civil Engineering B 1991 B San Jose State University
$ Ph.D. B Civil Engineering B 1997 B University of Nevada, Reno

Registrations

- P.E. - Civil - Nevada – No. 9153
- P.E. - Civil – California – No. C 49578
- P.E. - Geotechnical – California – No. GE 2292
- P.E. - Civil - Oregon – No. 19675PE
- P.E. – Geotechnical – Oregon – No. 19675PE
- P.E. - Civil – Arizona – No. 35310
- P.E. - Civil – Utah – No. 971338-2202

Associated Experience

- University of Nevada, Reno - Course Instructor - CE 771 - Mining Waste Containment Design
- University of Nevada, Reno - Course Instructor - CE 771 - Practical Foundation Engineering

Experience

1997 to Present: Black Eagle Consulting, Inc.; Executive Vice President. Dr. Pilling maintains over 18 years of construction, geotechnical, transportation, and mining engineering experience, and has supervised the engineering and construction of such projects throughout the western United States and South America. As Executive Vice President, Dr. Pilling oversees daily office operations, including personnel and accounting issues, coordinates company marketing efforts, and performs project management, engineering and laboratory analyses, and report preparation on most projects. Dr. Pilling presently serves as our project manager of the Reno Retrack construction management team reviewing geotechnical design submittals for this rail project.

1996 to 1997: SEA, Incorporated; Senior Geotechnical Engineer. Dr. Pilling provided project coordination, management, supervision, and development, and performed field exploration, engineering analyses, and report preparation.

1990 to 1996: WESTEC; Project Manager. Mr. Pilling was responsible for general geotechnical analyses on most projects, as well as design, management, and permitting of heap leach and tailings storage facilities projects. His experience varied from foundation design recommendations for small pump house structures to detailed liquefaction and seepage/slope stability analyses for large earthen embankments.

1986 to 1990: Case Pacific Company; Project Manager. Mr. Pilling provided cost estimating, project management, and contract negotiation on a wide variety of projects. Responsibilities included design and

construction of drilled shafts, earth retention, and underpinning systems, in addition to construction scheduling and cost control.

Affiliations

- American Public Works Association
- American Concrete Institute: Concrete Field Testing Technician Grade I
- National Society of Professional Engineers
- Secretary/Treasurer - National Society of Professional Engineers, Northern Nevada Chapter
- American Society of Civil Engineers
- International Association of Foundation Drilling
- National Council of Examiners for Engineering and Surveying
- American Society of Engineering Education
- Deep Foundations Institute

Publications

Ashour, M., P. A. Pilling, G. M. Norris, and H. Perez, June 1996, ADevelopment of a Strain Wedge Model Program for Pile Group Interference and Pile Cap Contribution Effects,@ Report No. CCEER-94-4, University of Nevada, Reno; Federal Study No. F94TL16C, Submitted to State of California Department of Transportation (CalTrans).

Ashour, M., P. A. Pilling, and G. M. Norris, March 1997, ADocumentation of the Strain Wedge Model Program for Analyzing Laterally Loaded Isolated Piles and Pile Groups,@ Proceedings, 32nd Symposium on Engineering Geology and Geotechnical Engineering, Boise, Idaho, pp. 344-359.

Ashour, M., P. Pilling, and G. Norris, 1998, "Updated Documentation of the Strain Wedge Model Program for Analyzing Laterally Loaded Piles and Pile Groups," Proceedings, 33rd Engineering Geology and Geotechnical Engineering Symposium, University of Nevada, Reno, pp. 177-178.

Ashour, M., G. Norris, and P. Pilling, April 1998, ALateral Loading of a Pile in Layered Soil Using the Strain Wedge Model,@ Journal of Geotechnical and Geoenvironmental Engineering, ASCE, Vol. 124, No. 4, pp. 303-315.

Ashour, M., G. M. Norris, S. Bowman, H. Beeston, P. Pilling, and A. Shamsabadi, March 2001, "Modeling Pile Lateral Response in Weathered Rock," Proceeding 36th Engineering Geology and Geotechnical Engineering Symposium, University of Nevada, Las Vegas, 2001.

Ashour, M., G. Norris, and P. Pilling, July/August 2002, "Strain Wedge Model Capability of Analyzing the Behavior of Laterally Loaded Isolated Piles, Drilled Shafts, and Pile Groups," Journal of Bridge Engineering, ASCE, Vol. 7, No 4, pp. 245-354.

Ashour, M., P. Pilling, and G. M. Norris, March 26 – 31, 2001, "Assessment of Pile Group Response Under Lateral Load," Proceedings, 4th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, University of Missouri – Rolla, MO, Paper 6.11.

Norris, G. M., M. Ashour, P. A. Pilling, and P. Gowda, March 1995, AThe Non-Uniqueness of p-y Curves for Laterally Loaded Pile Analysis,@ Proceedings, 31st Symposium on Engineering Geology and Geotechnical Engineering, Logan, Utah, pp. 40-53.

Norris, G. M., P. K. Gowda, and P. A. Pilling, February 1993, AStrain Wedge Model Formulation for Piles,@ Report No. CIS 91-11, University of Nevada, Reno.

Pilling, P. A., 1997, AThe Response of a Group of Flexible Piles and the Associated Pile Cap to Lateral Loading as Characterized by the Strain Wedge Model,@ Doctoral Dissertation, University of Nevada, Reno.

Pilling, P. A. and P. V. Woodward, March 1995, ADependent Facility Closure in California,@ Proceedings, Mine Closure: Creating Productive Public and Private Assets, Sparks, Nevada, pp. 315-326.

Pilling, P.A. and H. E. Beeston, March 1998, AExpansion Testing of Clay Soils in Forensic Investigations,@ Proceedings, 33rd Symposium on Engineering Geology and Geotechnical Engineering, Reno, Nevada, pp. 119-127.

Pilling, P.A., M. Ashour, and G.M. Norris, 2001, "Strain Wedge Model Hybrid Analysis of a Laterally Loaded Pile Group," Journal of the Transportation Research Board, Transportation Research Record No. 1772, Paper No. 01-0174, pp. 115-121.

Pilling, P.A., July 2002, "Assessing the Liquefaction Potential of Sand Deposits Containing an Appreciable Amount of Gravel," Program with Abstracts 2002 Annual Meeting Association of Engineering Geologists and American Institute of Professional Geologists, Reno, Nevada, p35.

Awards

- Hugh B. Williams Industry Advancement Scholarship, International Association of Foundation Drilling (ADSC), 1993-94.

- National Society of Professional Engineers, Northern Nevada Chapter, Young Engineer of the Year, 1996.

DECLARATION OF
Mark Hesters

I, **Mark Hesters** declare as follows:

1. I am presently employed at the California Energy Commission, in the **ENGINEERING OFFICE** of the Energy Facilities Siting Division as a **Senior Electrical Engineer.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on the **Transmission System Engineering**, for the **Russell City Energy Center Project Amendment No. 1** based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 3/29/08 Signed: _____

At: Sacramento, California

Mark Hesters
Associate Electrical Engineer

Mark Hesters has fourteen years of experience in electric power regulation. He worked in the Engineering Office of the California Energy Commission's Energy Facilities Siting & Environmental Protection Division since 1998 providing analysis of California transmission systems and testimony on transmission systems in several Commission power plant certification processes. Prior to that Mark worked in the CEC's Electricity Analysis Office providing lead analysis on Southern California Edison resource issues and modeling support for all areas of California. He holds a B.S. degree from the University of California at Davis in Environmental Policy Analysis and Planning.

DECLARATION OF
AJOY GUHA

I, **Ajoy Guha,** declare as follows:

1. I am presently employed by the California Energy Commission in the **Transmission System Engineering unit** of the Energy Facilities Siting Division as an Associate Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transmission System Engineering**, for the **Russell City Energy Center Project Amendment No. 1** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 21, 2007 Signed: _____

At: Sacramento, California

RESUME

AJOY GUHA

Associate Electrical Engineer
California Energy Commission
1516 Ninth Street, MS 46
Sacramento, CA 95814

EDUCATION:

MSEE, POWER SYSTEMS ENGINEERING, PURDUE UNIVERSITY, INDIANA
BSEE, ELECTRICAL ENGINEERING, CALCUTTA UNIVERSITY, INDIA

CERTIFICATIONS:

REGISTERED PROFESSIONAL ENGINEER, CALIFORNIA, INDIANA & ILLIINOIS
MEMBER OF IEEE; MEMBER OF THE INSTITUTION OF ENGINEERS OF INDIA

SUMMARY OF PROFESSIONAL BACKGROUND:

Ajoy Guha, P. E. has years of electric utility experience with an extensive background in evaluating and determining current and potential transmission system reliability problems and their cost effective solutions. He has a good understanding of the transmission issues and concerns. He is proficient in utilizing computer models of electrical systems in performing power flow, dynamic stability and short circuit studies, and provide system evaluations and solutions, and had performed generator interconnection studies, area transfer and interconnected transmission studies, and prepared five year transmission alternate plans and annual operating plans. He is also experienced in utilizing Integrated Resource Planning computer models for generation production costing and long term resource plans, and had worked as an Executive in electric utilities and experienced in construction, operation, maintenance and standardization of transmission and distribution lines.

WORK EXPERIENCE:

CALIFORNIA ENERGY COMMISSION, ENERGY FACLITIES SITING AND ENVIRONMENTAL DIVISION, SACRAMENTO, CA, 11/2000-Present.
Working as Associate Electrical Engineer in the Transmission System Engineering unit on licensing generation projects. Work involves evaluating generation interconnection studies and their impacts on transmission system, and providing staff assessments and testimony to the commission, and coordination with utilities and other agencies.

ALLIANT ENERGY, DELIVERY SYSTEM PLANNING, MADISON, WI, 4/2000-9/2000.
Worked as Transmission Services Engineer, performed Generator Interconnection studies and system planning studies.

IMPERIAL IRRIGATION DISTRICT, POWER DEPT., Imperial, California, 1985-1998.
Worked as Senior Planning Engineer in a supervisory position and in Transmission, Distribution and Integrated Resource planning areas. Performed interconnection studies for 500 MW geothermal plants and developed plan for a collector system, developed methodologies for transmission service charges , scheduling fees and losses. Worked as the Project Leader in the 1992 Electricity Report (ER 92) process of the California Energy Commission. Worked as the Project Leader for installation of an engineering computer system and softwares. Assumed the Project Lead in the standardization of construction and materials, and published construction standards.

CITY LIGHT & POWER, Frankfort, Indiana, 1980 – 1985.
Worked as Assistant Superintendent and managed engineering, construction and operation depts.

WESTERN ILLINOIS POWER CO-OP., Jacksonville, Illinois, 1978 – 1980.
Worked as Planning Engineer and was involved in transmission system planning.

THE CALCUTTA ELECTRIC SUPPLY CORPORATION LTD. (CESC), Calcutta, India, 1964 –1978.
Worked as District Engineer and was responsible for managing customer relations, purchasing and stores, system planning, construction, operation and maintenance departments of the most industrialized Transmission and Distribution division of the Utility. Worked as PROJECT MANAGER for construction of a 30 mile Double Circuit 132 kV gas-filled Underground Cable urban project. During 1961-63, worked as Factory Engineer for design, manufacturing and testing of transformers, motor starters and worked in a coal-fired generating plant.

DECLARATION OF
Testimony of Stanley Yeh

I, **Stanley Yeh,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as a Siting Project Manager.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **the Reconductoring Analysis for Eastshore-Dumbarton Line**, for the **Russell City Energy Center Amendment project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 12, 2007 Signed: _____

At: Sacramento, California

STANLEY YEH
Associate Environmental Scientist

ACADEMIC BACKGROUND
M.P.A., Environmental Policy, Columbia University, 2004
B.S., Environmental Studies, University of Southern California, 1998

PROFESSIONAL EXPERIENCE

Aspen Environmental Group **2006 to present**
Mr. Yeh has supported California Energy Commission (CEC) staff since the winter of 2006. He is currently serving as the CEC's Project Manager for the Application for Certification (AFC) environmental review process for the San Gabriel Generating Station, a 656-megawatt power plant proposed by San Gabriel Power Generation, LLC, located in San Gabriel, San Bernardino County. In this role, he is managing preparation of a Draft and Final Staff Assessment (including mitigation measures, or "conditions of certification"), holding workshops to hear Applicant and public comments, coordinating extensively with CEC staff counsel, and will be representing the CEC at the Evidentiary Hearing for the project.

Mr. Yeh has also prepared staff assessment Alternatives Analyses (consistent with CEQA and the CEC's procedures) for the CEC's staff reports considering proposed new or repowered power plants at Highgrove (Grand Terrace, San Bernardino County), Sun Valley (Riverside County), Vernon (Vernon, Los Angeles County), and Humboldt Bay (Humboldt County).

Questa Environmental Consulting **2004 to 2006**
As a CEQA Project Manager for the Los Angeles Unified School District (LAUSD), Mr. Yeh directed and oversaw the work of several teams of CEQA professionals to produce CEQA documentation for more than 20 new elementary, middle school and high school construction projects. He was responsible for evaluating proposals, directing and reviewing analysis of all CEQA documents, developing schedules, tracking and reporting project progress, managing the budget for each project, and organizing and conducting all Scoping and Draft EIR community public meetings for each project. He also coordinated the preparation of special studies related to the safety of new schools including traffic and pedestrian safety studies, health risk assessments, pipeline safety studies, rail safety studies and other similar efforts required to meet Title 5 (California Education Code) requirements. Additional duties included routine interfacing with architectural and design management staff, real estate managers, legal counsel, community outreach specialists and other professional District staff.

Environmental Protection Agency **2004**
As a consultant, Mr. Yeh wrote and edited sections of a Brownfield analysis report for Region 2 of the Environmental Protection Agency (EPA). He analyzed completed Brownfield projects to identify new methods and strategies to improve future Brownfield development. His research included the interviewing of participants and decision-makers at the Brownfield sites to identify local community impact, the amount of public participation, and economic impacts.

New Jersey Department of Environmental Protection **2003**
As a consultant, Mr. Yeh wrote and edited sections of a report for the New Jersey Department of Environmental Protection (NJDEP) on the availability of Arsenic and/or other related metals in the community of Hopewell Township. His activities included evaluating drinking water quality and water consumption in the community by sampling from drinking water sources at individual residences, interviewing with residential occupants, and analyzing collected data.

Meredith and Associates **2001 to 2003**
As a Staff Scientist, Mr. Yeh researched, wrote and edited Phase I environmental site assessments for commercial, residential, industrial, and school properties. He conducted agency and field research to support health/safety risk assessments of railways, air toxics, and natural gas/petroleum pipelines. He also participated in the review of CEQA documents for technical and editorial accuracy.

Folger Levin & Kahn LLP **1999 to 2001**
As a Legal Assistant, Mr. Yeh assisted an environmental attorney in the preparation of CEQA and environmental justice presentations for practicing legal professionals. He provided case law research for litigation cases, including labor/employment, business/transactional, and environmental. He also created and maintained document databases and privilege logs, and prepared legal memorandums.

Foley Bezek & Komoroske LLP **1998 to 1999**
As a consultant, Mr. Yeh participated in the discovery process of a class action environmental suit. He reviewed and coded documents pertaining to hazardous material use, soil and groundwater contamination, ambient toxics, remediation, and Federal/State environmental agency communications. His duties also included interaction with opposing counsel and attendance at project meetings.

University of Southern California, Department of Biological Sciences **1997 to 1998**
As a laboratory assistant, Mr. Yeh conducted research on Isopod specimens and Trilobite fossils from the Los Angeles County Museum of Natural History and Department of Earth Sciences at the University of Southern California to study morphological changes. His duties also included library research and laboratory research by scan and digitization of specimens and fossils.

ADDITIONAL TRAINING AND COURSES

- California Environmental Quality Act (CEQA) Compliance Workshop, January 2005
- CEQA Advanced Workshop Series, Association of Environmental Professionals, March 2007
- California Energy Commission Expert Witness Training, February 2007