

1.0 EXECUTIVE SUMMARY

1.1 PROJECT OVERVIEW

Calpine Corporation (Calpine) and Bechtel Enterprises Holdings, Inc. (Bechtel), known as the Calpine/Bechtel Joint Development, propose to construct, own, and operate a merchant energy generating facility in the Industrial Corridor of the City of Hayward, Alameda County, California, to be known as the Russell City Energy Center (RCEC). The RCEC will be a natural gas-fired, combined-cycle electric generating facility rated at a nominal gross generating capacity of 600 megawatts (MW). The proposed 14.7-acre project site is located at the southwest corner of the intersection of Enterprise Avenue and Whitesell Street, directly south of the City of Hayward's Water Pollution Control Facility (WPCF).

The project also includes the construction and operation of an advanced wastewater treatment plant (AWT plant) adjacent to the energy center that will treat secondary effluent that is currently discharged to San Francisco Bay to produce high-quality water for use in the energy center's cooling and process water systems. Secondary effluent will be supplied to the AWT plant by the Hayward WPCF. Secondary effluent from the East Bay Dischargers Authority (EBDA) pipeline from the Union Sanitary District (USD) wastewater treatment plant will serve as a backup supply to the AWT plant.

Approximately 11 acres of the 14.7-acre proposed site for the RCEC is currently occupied by the transmitter facilities of Radio Station KFAX, AM 1100. The owner of KFAX has applied to the City of Hayward for permission to construct and operate new transmitter facilities on a closed City of Hayward landfill located approximately 1.25 miles from the existing transmitter facility. The City of Hayward is currently preparing an environmental document, in compliance with the provisions of the California Energy Quality Act (CEQA), that addresses the removal of the existing KFAX transmitter facility and construction of the new transmitter facility. Calpine/Bechtel has been advised that completion of the City of Hayward's CEQA review is anticipated by mid summer 2001. A copy of the City's environmental clearance document will be submitted to the California Energy Commission (CEC) Docket Office when it becomes available. A legal description of the RCEC site is attached as Appendix 1-A. A list of property owners adjacent to the RCEC site and linear corridors is attached as Appendix 1-B.

1.1.1 The Russell City Energy Center

Figure 1-1 is a rendering that shows the project in its surroundings. Figure 1-2 shows the location of the project features. The proposed energy center will consist of the following:

- A 600-megawatt (MW) nominal, natural gas-fired, combined cycle generating facility consisting of two "F-Class" combustion turbine-generators (CTGs), two multi-pressure, supplementary-fired heat recovery steam generators (HSRGs), a single 3-pressure, reheat, condensing steam turbine-generator (STG), and a hybrid, wet/dry plume-abated mechanical draft cooling tower
- A 230-kilovolt (kV) on-site switchyard
- A 1.1-mile 230-kV, double-circuit overhead transmission line connecting the RCEC switchyard to the existing Pacific Gas and Electric (PG&E) Eastshore Substation via PG&E's existing Eastshore to Grant 115-kV transmission corridor which is located approximately 600 feet from the northeast corner of the project site

- Approximately 0.9 miles of 16-inch diameter underground natural gas pipeline from PG&E's gas distribution Line 153 to the RCEC site
- Approximately 100 feet of new 12-inch diameter domestic water/firewater pipeline from the existing City water main in Whitesell Street
- Approximately 2,000 feet of new industrial wastewater discharge pipeline to the headworks of the Hayward WPCF

1.1.2 Advanced Wastewater Treatment (AWT) Plant

The proposed new AWT plant will produce high-quality water for plant cooling and process makeup needs from treated secondary effluent that is currently discharged to San Francisco Bay via EBDA. The AWT plant will consist of the following:

- Micro-Filtration (MF) and Reverse Osmosis (RO) treatment trains to remove suspended solids and dissolved solids from the incoming treated secondary effluent
- Chlorine contact basins to eliminate any residual biological contamination from the treated water in accordance with Title 22 (California Code of Regulations, Title 22, Section 60301.230)
- Product water storage tanks sufficient to provide for 24 hours of energy center operation at average consumption during interruptions of AWT plant operation
- Precipitation and clarification processes to remove metals and other potentially harmful dissolved solids from the RO reject water stream
- Solids processing and handling systems to convert the sludge from the metals separation process to a benign solid form that can be transported by truck for disposal off-site
- Approximately 150 feet of new pipelines beneath Enterprise Avenue to convey secondary effluent to the AWT plant and to convey AWT wastewater streams to the WPCF
- Approximately 700 feet of new pipeline to convey backup secondary effluent from the existing EBDA pipeline to a connection in the supply line from the WPCF to the AWT plant

1.1.3 RCEC and AWT Plant Arrangement

The site arrangement shown in Figure 2.2-1 and typical elevation views shown in Figures 2.2-2a and 2.2-2b illustrate the location and size of the proposed energy facility and the adjacent AWT Plant. The parcel will be fenced to accommodate the generation facilities, including the storage tank areas, parking area, control/administration building, water treatment building, emission control equipment, generation equipment, and the on-site switchyard. The AWT plant will be separately fenced at the northwest corner of the property to provide security for that operation.

Access to the RCEC site will be via a driveway off Enterprise Avenue through a security gate. Most of the RCEC site will be paved to provide internal access to all facilities and onsite buildings. Access to the AWT plant will be via a separate driveway off Enterprise Avenue through a separate security gate.

1.2 PROJECT SCHEDULE

Calpine/Bechtel has requested that this Application for Certification (AFC) for the RCEC be processed under the CEC's expedited six-month licensing process. Assuming the project receives a license by January 2002, construction of the RCEC and the AWT plant will begin in the summer of 2002. Pre-operational testing of the energy center and AWT plant will begin in the spring of 2004, and full-scale commercial operation is expected to commence in the summer of 2004.



Figure 1-1
Architectural Rendering

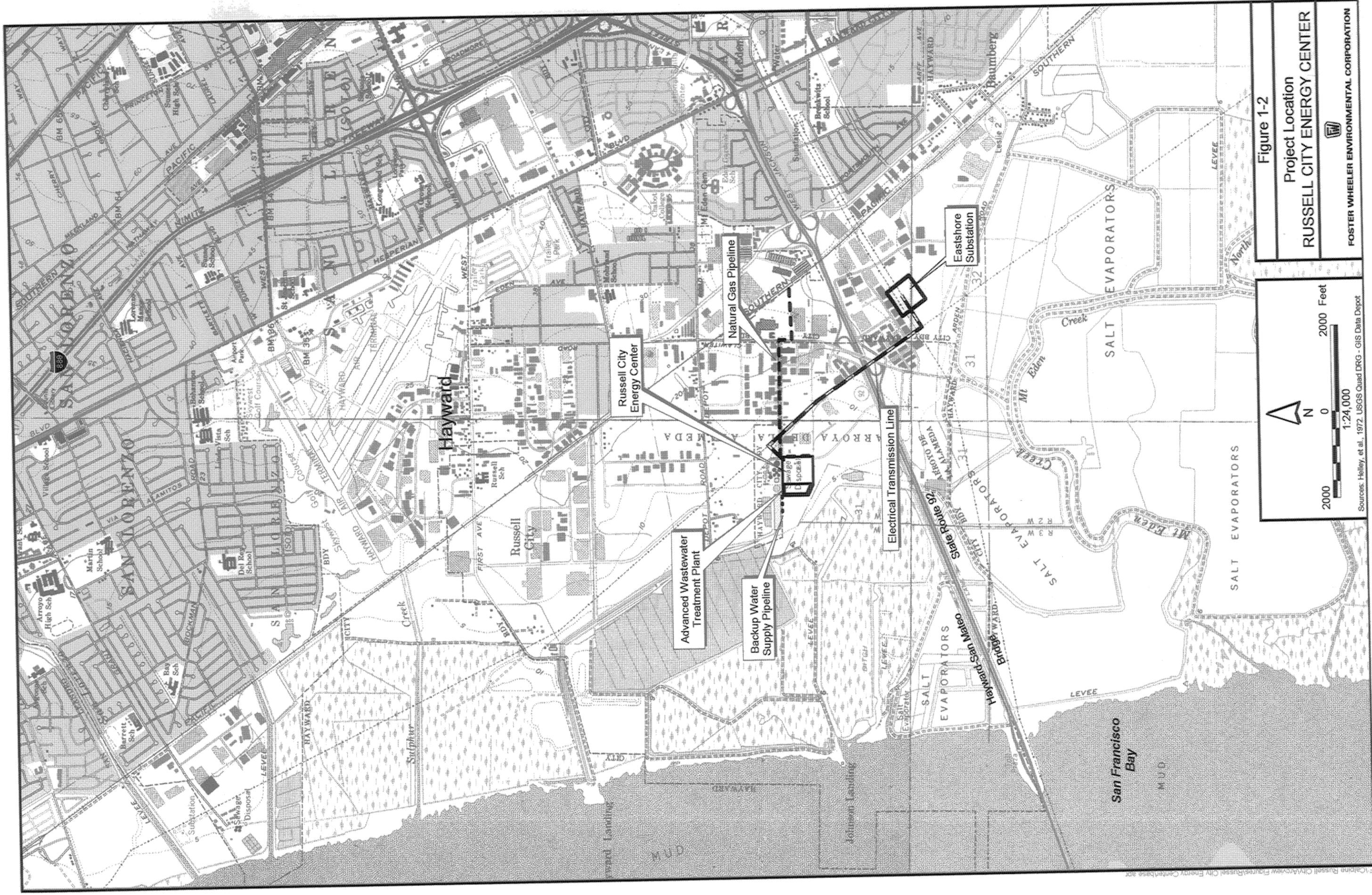


Figure 1-2

Project Location
RUSSELL CITY ENERGY CENTER

 FOSTER WHEELER ENVIRONMENTAL CORPORATION

2000 0 2000 Feet
 1:24,000
 Sources: Helley, et al., 1972. USGS Quad DRG - GIS Data Depot

Source: Helley, et al., 1972. USGS Quad DRG - GIS Data Depot

1.3 PROJECT OWNERSHIP

The RCEC will be jointly owned by Calpine and Bechtel. The two companies established a joint development program in late 1998 for the express purpose of developing, owning, and operating a number of natural gas-fired merchant power plants in the San Francisco Bay Area. The Delta Energy Center, which is under construction in Pittsburg, was the first Calpine/Bechtel project approved by the CEC. The Metcalf Energy Center, which is in the final stages of CEC review, will be the second. The Russell City Energy Center would be the third.

The AWT plant will be designed and constructed by Calpine/Bechtel and owned and operated by the City of Hayward.

1.3.1 Calpine Corporation

Calpine is an independent power developer, owner, and operator. Its headquarters are located in San Jose, California. Calpine is a publicly traded company with the NYSE stock symbol CPN.

Calpine owns an interest in 50 power generation facilities and geothermal steamfields having an aggregate capacity of 7,000 MW. Calpine's Sutter Power Plant near Yuba City in Sutter County is nearing completion and is expected to begin commercial operation this summer. Calpine also has two merchant power plants under construction in Pittsburg, Contra Costa County: the Los Medanos Energy Center and the Delta Energy Center. They are expected to be online by summer 2001 and summer 2002, respectively. Both the Sutter and Delta projects are being constructed by Bechtel Power Corporation. In addition, Calpine owns and operates natural gas-fired cogeneration facilities in Gilroy, King City, Watsonville, San Jose, and the Greenleaf 1 and 2 plants adjacent to the Sutter Power Plant near Yuba City. Across North America, Calpine currently has 27 plants under construction and 28 plants in announced development for a total of an additional 32,660 MW.

1.3.2 Bechtel Enterprises Holdings, Inc.

Bechtel Enterprises Holdings, Inc. is the development, finance and ownership entity within the Bechtel Group of Companies. Bechtel is based in San Francisco, California, with offices worldwide.

A privately held firm, Bechtel is one of the world's largest engineering and construction companies. Bechtel has extensive experience in the development and construction of power, petrochemical, and large infrastructure projects both in the U.S. and internationally. Until 1997, Bechtel was a partner with PG&E in both the U.S. Generating Company (now PG&E Generating Company), and the International Generating Company (now InterGen). Bechtel is now partnered with Shell in ownership of InterGen, which now operates worldwide. InterGen has recently secured CEC approval for three peaking generating facilities in southern California, and is actively developing other projects in California, elsewhere in the US, and overseas. Bechtel/InterGen currently has ownership interests in more than 17,000 MW of power generating capacity in operation, construction, or advanced development worldwide. Bechtel Power Corporation, another member of the Bechtel Group of Companies, will be the engineer/constructor for the RCEC, the AWT plant, and the associated linear facilities.

1.3.3 CURE Labor Agreement

Calpine has entered into an agreement with the California Unions for Reliable Energy (CURE) to establish a proactive and strong working relationship between the project sponsors and labor for the construction of the RCEC. In addition, Bechtel constructs projects using Union labor under a National Presidents' Agreement with the National Building Trades Council.

1.3.4 Other Agreements

Calpine/Bechtel will contract with PG&E for ownership and operation of the new electrical interconnection facilities required to transmit power from the RCEC switchyard into the Bay Area electrical grid. Calpine/Bechtel will also contract with PG&E for the ownership and operation of the new natural gas supply pipeline for the RCEC. Calpine/Bechtel will contract with PG&E and/or other natural gas suppliers to supply natural gas to the RCEC. The legal relationship between Calpine and Bechtel, as owner of the RCEC, and PG&E and other suppliers will be contractual only (one of supplier/user or seller/buyer of services or products).

1.4 PROJECT ALTERNATIVES

A “No Project” Alternative was considered and rejected. The “no project” alternative fails to meet the basic project objectives of the RCEC project as described in this Application. For example, the “no project” alternative is inconsistent with one of the primary business objectives of Calpine/Bechtel’s program to develop merchant power generation facilities, which is to generate and sell electric power in the deregulated power market. In addition, the “No Project” Alternative could result in greater fuel consumption and air pollution in the state, because older, less efficient plants with higher air emissions would continue to generate power instead of being replaced with cleaner, more highly efficient plants, such as the RCEC. The “No Project” Alternative is also inconsistent with the energy policies and directives issued by Governor Gray Davis in recent months to bring additional electrical generating capacity on line as quickly as possible to help resolve California’s current energy crisis.

Five possible alternative sites in the general vicinity of the proposed site were reviewed and rejected as infeasible because they fail to meet most of the RCEC project’s basic objectives, fail to avoid or minimize potentially significant environmental effects (in part because no such effects are identified for the project), and/or include the potential for the alternatives themselves to result in one or more significant environmental impacts. A complete discussion of project alternatives is presented in Section 9. Similarly, alternative routes for the natural gas line, electric transmission line, and water lines were also reviewed and found to be infeasible, failed to avoid or minimize any potential significant environmental effects, or had the potential to cause significant environmental effects avoided or minimized by the proposed project. Natural gas pipeline alternatives, electric transmission connection alternatives, and water line alternatives are also presented in Section 9.

Several alternative generating technologies were reviewed in a process that led to the selection of a modern, yet conventional, natural gas-fired combustion turbine combined-cycle arrangement for the RCEC. The alternative technologies included conventional oil and natural gas-fired plants, simple-cycle combustion turbines, biomass-fired plants, waste-to-energy plants, solar plants, wind generation plants, and others. None of these technologies was considered better than or equal to the combined-cycle technology selected for the RCEC.

1.5 ENVIRONMENTAL CONSIDERATIONS

Pursuant to the requirements set forth in existing law and the CEC’s regulations, sixteen areas of possible environmental impact from the proposed project were investigated. Detailed descriptions and analyses of these areas are presented in Sections 8.1 through 8.16 of the AFC. As discussed in detail herein, with the implementation of the proposed mitigation measures and the anticipated Conditions of Certification, there will be no significant unmitigated environmental impacts associated with the construction and operation of the RCEC project. All sixteen subject areas are discussed in detail in Section 8 of this Application. This Executive Summary highlights findings related to five subject areas that are typically of the most

interest in a CEC proceeding: air quality, water resources, visual resources, biological resources, and noise.

1.5.1 Air Quality

The site is located in the State of California ambient air quality standards nonattainment area for both ozone and particulate matter with a diameter less than 10 microns (PM₁₀). An assessment of the impact to air quality was performed using detailed air dispersion modeling. The air impacts from the RCEC will be mitigated by the proposed combustion turbine emission control technology and cooling tower drift control technology. Additionally, emission reduction credits (ERCs) will be obtained to offset the project's emissions of volatile organic compounds (VOCs) and NO_x, both of which are precursors of ozone, and PM₁₀. These mitigation measures will result in the project having no significant adverse impact on air quality or public health. The AWT plant will not produce any emissions of concern. See Section 8.1 for a detailed analysis of air quality.

1.5.2 Water Resources

The water to be used in the RCEC cooling tower and as process makeup for the power cycle systems will be high-purity tertiary treated water produced from secondary effluent from either the City of Hayward's WPCF or from the USD/EBDA backup supply. No potable or otherwise fresh water will be used for these purposes. The peak and average net consumptions of water by the RCEC are approximately 5.27 and 3.33 million gallons per day (mgd), respectively. Section 8.15 includes a detailed analysis of water resources.

1.5.3 Visual Resources

The most prominent visual features of the RCEC will be two HRSGs and their associated exhaust stacks and the cooling tower. The HRSG exhaust stacks will be 145 feet high. The HRSG casings will be approximately 90 feet high. The cooling tower will be approximately 64 feet tall to the tops of the fan exhaust cones.

An architectural screening treatment will be provided around the combustion turbines, HRSGs, and the HRSG exhaust stacks. Additional architectural screening will be provided around the cooling tower and to the south of the steam turbine-generator systems. Rather than attempting to disguise the energy center as something else, this architectural treatment will make the facility an architectural landmark visible to travelers crossing the Hayward-San Mateo bridge at the western gateway to the City. Section 8.13 presents a detailed description and depictions of the proposed architectural treatment and discussion of the resulting visual effects of the RCEC. A letter from the City of Hayward endorsing the RCEC architectural design concept is attached as Appendix 1-C.

The RCEC will employ a hybrid wet/dry, plume-abated cooling tower design that will prevent the formation of visible plumes above the cooling tower under all but the most extreme cold weather conditions. Various control features will be incorporated in the design of the balance of the energy center to prevent the formation of visible plumes from other sources.

1.5.4 Biological Resources

The project would cause no significant impacts to endangered or threatened species. The project site contains 1.68 acres of seasonal wetlands. Calpine/Bechtel will obtain a permit under the Clean Water Act from the U.S. Army Corps of Engineers to fill these wetlands at the plant site. The permit application will include a plan to mitigate this potential impact to below significance level. The mitigation plan may involve replacement of the seasonal wetlands with wetlands of equivalent value or contribution to ongoing wetland restoration projects in the Hayward Shoreline area. See Section 8.2 for a detailed discussion of biological resources.

1.5.5 Noise

Ambient noise measurements were taken to determine the L_{90} (the noise level that is exceeded during 90 percent of the measurement period) nighttime noise level at the nearest residence (i.e., sensitive receptor). Noise modeling was used to determine the RCEC's contribution to the nighttime ambient noise levels at the nearest residence. The RCEC's contribution to cumulative noise will not cause the background level to be increased by more than 5 dBA (barely noticeable increase) at the nearest receptor. Since the cumulative increase in noise level at the nearest receptor will be barely noticeable during the quietest nighttime hours at the nearest receptor, no adverse impact is expected as a result of the normal operation of the facility. Noise modeling was also used to determine the L_{DN} noise levels at the project's property lines. The project will comply with the City of Hayward's property line noise limit of 75 dBA, L_{DN} . The AWT plant will not generate any significant operational noise. See Section 8.7 for a detailed analysis of potential noise impacts.

1.6 KEY BENEFITS

1.6.1 Environmental

The RCEC will employ advanced, high efficiency combustion turbine technology and SCR to minimize emissions from the facility. NO_x emissions (a precursor to smog) produced by the RCEC, will be approximately 90 percent less than those produced by existing power plants in the Bay Area. In addition to the significant reduction of emissions, the RCEC's operating efficiency will be such that the plant will consume 40 percent less fuel than existing plants of similar size. The RCEC will also purchase and permanently retire Emission Reduction Credits, or "offsets", to more than compensate for its minimal emissions. Because its superior efficiency will make the RCEC one of the new Bay Area energy centers that will be called upon to run when older, highly-polluting generating units cannot compete economically, the RCEC will hasten the retirement or the modernization of the older generating units, thereby contributing to a net air quality improvement for the region.

The use of tertiary treated water as cooling and process water makeup for the RCEC will benefit San Francisco Bay. The mass emission of heavy metals and solids discharged by EBDA will be reduced by conversion of dissolved and particulate metals into benign solids through the AWT processes. Most significantly, the RCEC/AWT plant project will reduce copper discharge to the Bay by 12 kg/month, which represents an 8 percent reduction in the total discharge from the EBDA system.

1.6.2 Employment

The project will provide for a peak of approximately 485 construction jobs over a 2-year period and approximately 25 skilled, family-wage positions in the energy center throughout the life of the plant. The AWT plant will provide an additional 6 skilled family-wage operator positions throughout the life of the plant. In addition to the direct employment benefit, the RCEC and the AWT plant will require and use

the services of local firms for major maintenance and overhauls, plant supplies, and other support services throughout the life of the facility.

1.6.3 Tax Base

The RCEC will be a significant tax contributor, generating \$3 to \$5 million per year in property taxes that will support the services and programs of Alameda County, Hayward, and other nearby communities. The California State Board of Equalization is currently debating whether a power generation facility should be assessed at the county or the state level. If the facility were assessed by the state, property tax revenues would be allocated countywide; if the facility were assessed at the county level, the allocation would be dispersed to the local tax jurisdiction within which the facility is sited.

1.6.4 Energy Efficiency

The RCEC will be an efficient, environmentally responsible source of economic and reliable energy to serve the growing energy demands of the Bay Area.

1.7 PERSONS WHO PREPARED THE AFC

Persons with primary responsibility for the preparation of each section of this AFC are listed in Appendix 1-D.

Russell City Energy Center AFC

May 2001