SECTION 1.0

Executive Summary

1.1 Introduction

This application for a Small Power Plant Exemption (SPPE) for the proposed Chevron Richmond Refinery (hereinafter referred to as **the Refinery**) Power Plant Replacement Project (hereinafter referred to as **the PPRP** or **the Project**) has been prepared by Chevron in accordance with the California Energy Commission's (CEC's) Power Plant Site Certification Regulations (August 2000). This Executive Summary provides an overview of the proposed Project.

This SPPE Application has been prepared in accordance with CEC guidelines and provides:

- A detailed description of the proposed Project
- An assessment of the Project's likely impact on the existing environment
- Mitigation measures developed by Chevron to assure that environmental impacts are properly and responsibly addressed
- A discussion of compliance with applicable laws, ordinances, regulations, and standards (LORS) provided within the project description and each resource section

1.2 Project Overview

Chevron is proposing the PPRP to add an additional 60 megawatts (MW) net generation to its existing Refinery electrical generation located within Chevron's Richmond Refinery in the City of Richmond (see Figure 1.2-1) in Contra Costa County, California. The proposed PPRP will be integrated into Chevron's plans to meet its growing Refinery electrical load, and produce steam to replace an existing boiler plant that is approaching its end of life. The PPRP is a subset of the larger Chevron Renewal Project (hereinafter referred to as the Renewal Project) that is concurrently undergoing California Environmental Quality Act (CEQA) review by the City of Richmond. The California Energy Commission has exclusive jurisdiction for only the PPRP portion of the Renewal Project that is the subject of this application.

The PPRP will consist of the following four facilities, which are located in separate areas of the Refinery:

- A nominal 43-MW (net) cogeneration train (hereinafter referred to as Cogen 3000), located in the existing Refinery cogen facility. Cogen 3000 consists of one natural gas or liquid petroleum gas (butane)-fired combustion turbine generator (CTG); a refinery fuel gas-fired heat recovery steam generator (HRSG); 115-kV existing switchyard tie-in; 13.8-kV, 2.4-kV, and 480-V switchgear; ancillary equipment; and adjacent onsite service connections for fuel, water, wastewater, and steam on existing piperacks.

- Reconductoring to upgrade ampacity of approximately 4,000 ft of existing on-site double-circuit overhead 115-kV transmission line (hereinafter referred to as Cogen Lines 1 and 2), located between the cogen facility substation and the Refinery's main switchyard. The reconductoring will reuse existing transmission line structures with no modifications to the structures.
- A nominal 17-MW (net) steam turbine generator (hereinafter referred to as H_2-STG), located in a new hydrogen production facility. The H_2-STG consists of an extraction, condensing steam turbine generator, an associated wet cooling tower and pumps, 12.47-kV and 480-V switchgear, and adjacent onsite service connections for, recycled water, water, wastewater, steam and electricity on existing piperacks, installed as part of the new hydrogen production facility. The remainder of the hydrogen plant is under review by the City of Richmond as part of the Renewal Project. The new hydrogen plant (including the H_2-STG and related equipment) will be installed, owned and operated by a third party under contract to Chevron and will be a net generator of steam for both the H_2-STG and the Refinery steam system.
- Shutdown of the existing Refinery steam boilers located at the existing No. 1 power plant (hereinafter referred to as No. 1 PP). No. 1 PP, which currently provides steam to the Refinery, will be retired after startup of the PPRP.

The Cogen 3000 portion of the PPRP will occupy approximately 0.5 acre within an existing 5.2-acre cogeneration facility, and the H_2-STG and associated equipment will occupy approximately 0.5 acre within a new 7.9-acre hydrogen plant that will be built as part of the Renewal Project. The PPRP will be located well within the heart of the existing 2,900-acre Richmond Refinery. Temporary construction laydown and parking for the PPRP will be provided in various existing laydown areas within the Refinery that are currently used for ongoing maintenance and project laydown. A complete description of the PPRP is provided in Section 2.0.

The Chevron Richmond Refinery processes crude oil into a variety of fuel and oil products. In addition to producing motor gasoline, jet fuel, diesel fuel, and lubricating oils, the Refinery also produces industrial fuel oil, liquefied petroleum gas, sulfur, and feedstocks commonly used in the petrochemical industry. During the lifetime of the Refinery, Chevron has added, replaced, and upgraded facilities to improve safety, reliability, and operational efficiency; produce reformulated gasoline in accordance with state and federal requirements; and comply with applicable environmental regulations. The proposed PPRP will be integrated into Chevron's plans to meet its growing Refinery electrical load, and produce steam to replace the existing boiler plant that is approaching its end of life.

The new Cogen 3000 will consist of one General Electric Frame 6B CTG and associated support equipment that will be linked to the Pacific Gas & Electric (PG&E) power grid by existing, onsite Refinery-owned double-circuit 115-kV transmission lines (Cogen Lines 1 and 2). Cogen Lines 1 and 2 run approximately 4,000 feet from the existing Chevron Substation 5 located within the existing Refinery cogen facility to the existing onsite Standard Oil Switching Station (SOSS). The SOSS is the point of common coupling with PG&E and interties to existing PG&E 115-kV El Sobrante 1 and 2 transmission lines. Substation 5, SOSS, and Cogen Lines 1 & 2 are located completely within the boundaries of the Refinery. As part of the Project, Cogen Lines 1 & 2 will be reconductored to increase

their ampacity. No new transmission line towers will be required, nor will any existing towers be modified or replaced.

Fuel for Cogen 3000 will be taken from existing fuel headers in the existing cogen facility main piperack. The new sections of line serving the new cogen train will be approximately 200 ft in length. Present fuel system capacity is adequate to serve Cogen 3000. With other Renewal Project fuel reductions, no increase in Refinery fuel usage is anticipated with the installation of the Project.

Water for Cogen 3000 CTG evaporative cooling system makeup will be treated water from the existing on-site reverse osmosis (RO) plant and tapped off of an existing header within the Refinery. Makeup water flow to this evaporative cooling system will be relatively small, from 0 gallons per minute (gpm) in cold weather to 15 gpm at the hottest peak ambient temperatures, with an annual average of less than 10 gpm.

Water for cycle makeup for Cogen 3000 will also come from the existing onsite RO plant. The RO plant is being upgraded to serve existing and Renewal Project needs. There will be no net increase in Refinery water usage due to Cogen 3000. The existing water feed to the RO plant will later be converted to recycled water from the EBMUD RARE project, if constructed.

The H_2-STG will be located within the proposed new hydrogen plant that will be installed, owned and operated by a third party, Praxair, under contract to Chevron. The H_2-STG will consist of a Dresser-Rand 17.8-MW (gross output) condensing, extraction steam turbine generator electrically tied to new 12.47-kV metalclad switchgear in the new hydrogen plant. This switchgear will inter-tie to existing 12.47-kV switchgear at Substation 4 via new and existing dual 12.47-kV power cables within the Refinery. The new approximately 800-foot section of 12.47-kV power cables will be routed in cable tray along a new piperack that will be installed in the hydrogen plant, then along existing piperack. The new section of cables will tie-in to existing power cables that are routed on poles to Substation 4. The power output from the STG will normally be mostly utilized by the new hydrogen plant. During normal operation Praxair expects to have approximately 1.4 MW of surplus power from the H_2-STG that will be exported to the Refinery electrical system for use by the Refinery. The Hydrogen plant will also export high pressure steam to the Refinery, and when additional steam is needed by the Refinery, will be able to shift their steam/power production balance on the H_2-STG to export more steam and produce less power.

Water for H_2-STG cooling tower makeup will be recycled water from EBMUD and will be tapped off of an existing recycled water header that currently serves the Refinery in the area of the Hydrogen plant.

Water for cycle makeup for the H_2-STG will also come from the existing onsite RO plant. The only cycle makeup water usage attributable to the H_2-STG is minor amounts due to turbine gland losses (about 15 gpm). Other than this, the turbine does not consume water that would not otherwise be used in the Hydrogen Plant. There will be no net increase in Refinery fresh water usage due to the H_2-STG.

As previously mentioned, usage of potable water by the Refinery is planned to be reduced in the future by approximately 3 to 4 mgd when a recycled water treatment plant being planned for installation on Refinery property by EBMUD comes on-stream. The new

recycled water treatment plant, known as the RARE project, will treat reclaimed water by micro-filtration, ultra-filtration, and reverse osmosis. The resultant RARE treated water will displace the existing potable water feed to the Refinery RO plant to supply all uses that are currently served by RO plant water such as boiler water makeup. The RARE project is expected to be operational some time after the PPRP is completed. The RARE project is being permitted by EBMUD and is not part of the Renewal Project.

1.2.1 Project Objectives

Chevron's Project objectives are described in more detail in Section 9.0, Alternatives. Some of Chevron's basic Project objectives include the following:

- To safely construct and operate a nominal 60-MW addition to Refinery generation
- To provide additional electrical generation to meet the Refinery's growing electrical load
- To shut down the aged boiler plant steam supply and replace it with a more efficient state-of-the-art cogeneration system steam supply
- To improve the reliability of critical Refinery operations by reduced dependence on power imported from the PG&E grid
- To assist the State of California (State) by reducing the amount of utility power used by the Refinery, thus helping to reduce the state's dependence on imported power
- To contribute to the diversification of the area's economic base by providing increased employment opportunities during construction and additional tax base
- To enhance the reliability of local power supply through self-generation of power

1.2.2 Project Site Selection

Chevron's approach to Project site selection focused on identifying potential sites that satisfy Chevron's basic Project objectives and that have low potential for environmental impacts. The proposed Project sites are consistent with these site selection criteria and were based, in part, on the following key selection criteria:

- Location within the Refinery and in close proximity to existing power generation utilities and Operations infrastructure
- Availability of sufficient clear plot space for new facilities, including construction and maintenance access
- Proximity to existing transmission and distribution lines and/or an existing substation
- Proximity to water supply headers
- Proximity to Refinery fuel supply headers
- Proximity to Refinery steam supply headers
- Consistency with the City or Richmond and Contra Costa County General Plans and zoning ordinances, height restrictions, and existing land uses

- The ability, with implementation of reasonable mitigation measures, to have a less-than-significant impact on the environment
- Location in an area consistent with future Refinery development

1.3 Project Ownership

Chevron USA, Inc. owns all of the property on which the generating sites will be located as well as all capital improvements proposed for the Cogen 3000 site. The capital improvements for the H_2-STG site will be owned and operated by Praxair under contract to Chevron.

1.4 Project Schedule

Construction of the H_2-STG is planned to take place from the third quarter of 2007 to the first quarter of 2009. Construction of Cogen 3000 is planned to take place over approximately 16 months, from second quarter 2008 to fourth quarter 2009. Plant testing is planned to commence in the first quarter of 2010, and commercial operation is expected to commence no later than the second quarter 2010.

1.5 Project Alternatives

The CEC conducts its review of alternatives to satisfy the Warren-Alquist Act and CEQA. Appendix F of the CEC Guidelines requires a discussion of the range of reasonable alternatives to the Project, or to the location of the Project, which would feasibly attain most of the basic objectives of the Project but would avoid or substantially lessen any of the significant effects of the Project. To enable this review, the criteria and objectives that led to the selection of the site and design features of the proposed Project are provided, along with a detailed discussion of the range of alternatives considered (see Section 9.0).

A "No Project" alternative was considered and rejected as inconsistent with Chevron's objectives, which include the need to develop additional electrical generation sources and to replace the steam supply from an aged boiler plant. In addition, the "No Project" alternative could result in greater fuel consumption and air pollution if the older, less-efficient No. 1 PP were not replaced by the proposed cleaner, more-efficient PPRP. Other possible alternative sites in the general vicinity of the proposed site were reviewed and found to be less acceptable than the proposed site.

Several alternative generating technologies were reviewed in a process that led to the selection of a modern, proven, combustion turbine cogeneration arrangement for PPRP using natural gas or LPG for fuel. The alternative technologies included natural-gas-fired boilers, and other less efficient combustion turbine generators in desired size range. None of these are feasible alternatives to the technology selected for PPRP. A complete discussion of Project alternatives is presented in Section 9.0.

1.6 Environmental Considerations

The impacts of the proposed Project and the mitigation measures that are included as a part of the proposed Project have been extracted from the analyses and evaluations presented and discussed in detail in Section 8.0 of this document.

1.6.1 Air Quality

Activities associated with Project construction would generate short-term emissions of criteria pollutants, including suspended and inhalable particulate matter and equipment exhaust emissions, during the term of proposed Project construction. This would be a potentially significant impact that would be mitigated to a less than significant level through the implementation of standard construction air quality mitigation measures identified in the Bay Area Air Quality Management District's (BAAQMD's) CEQA Guidelines.

Operational activities associated with the implementation of the proposed Project would not increase air pollutant emissions by potentially significant values. Operational impacts from criteria pollutant emissions would be less than significant.

1.6.2 Biological Resources

Proposed sites for Project components are within currently developed areas of the operating Refinery. They do not provide potential habitat for special-status species. No wetlands or other waters are located on or adjacent to these sites. Placement and construction of Project components will have no impact on biological resources.

Potential impacts to special-status fisheries could result if additional wastewater or pollutant discharges into San Pablo Bay were to occur. The State Implementation Plan and the San Francisco Bay Basin Plan regulate such discharges through National Pollutant Discharge Elimination System (NPDES) permits, a principal tool used in protection of aquatic sensitive species and other "beneficial uses" of State water resources.

Potential impacts to special-status fisheries could occur with additional water discharges from other non-Refinery industrial projects, together with cumulative Refinery projects.

Continued compliance with the discharge requirements of the Refinery's NPDES permit will assure that potential biological pollutant discharge increases remain at less-than-significant levels.

1.6.3 Noise

Project construction is not expected to produce significant noise impacts to adjacent sensitive land uses, such as nearby residences. Construction impacts would be mitigated to a less than significant level by implementing the identified mitigation measures.

Project operations would result in less than significant noise impacts on sensitive receptors.

1.6.4 Visual Resources

The proposed Project would be constructed within the developed portion of the existing 2,900-acre active area of the Refinery, which has been an active industrial facility for more than 100 years.

The proposed Project would not have a significant adverse effect on a scenic vista and would not discernibly degrade the existing visual character or quality of the site and its surroundings. Temporary, minor increases in night lighting at the Refinery would occur during peak construction times, when night-time work shifts are planned.

1.6.5 Water Resources

Rainwater runoff from stockpiles of contaminated soils excavated during site preparation of the building sites for the hydrogen plant STG could introduce additional contaminant loading into the waste stream. However, these stockpiled soils would be managed under a Stormwater Pollution Prevention Plan (SWPPP) as required by the Regional Water Quality Control Board, which would mitigate the potential impact to less-than-significant levels.

Net water consumption for the Refinery is expected to remain the same or decrease slightly over historic levels. Consumption of potable water will be reduced by 3 to 4 mgd if the RARE project is completed.

1.7 Key Benefits

1.7.1 Environmental

The Project will replace existing aged steam generation facilities with modern facilities providing improved reliability, energy efficiency, and additional environmental controls.

1.7.2 Employment

The Project will provide increased employment during the construction period. After construction no additional increase or decrease in current Refinery staffing is anticipated as a result of the Project.

1.7.3 Other

The Project will provide additional electrical and steam energy supply to help ensure the Refinery's ability to process future crude and gas oil supplies. This will increase the portion/percentage of the Refinery's total gasoline production that can meet California specifications and be distributed to local markets by 5 to 6 percent.

The Project will also invest in Refinery upgrades that produce a competitive return on capital.

1.8 Applicant Contacts and Proof of Service List

The following individuals listed in Table 1.8-1 should receive any correspondence regarding the SPPE review and be included on the CEC's Proof of Service list for the Project. Appendix 1.0-A presents a list of the persons who prepared the SPPE.

TABLE 1.8-1
Applicant Contacts and Proof of Service List

Name and Role	Mailing Address and Phone No.
Gary Carr SPPE Permitting Manager (Applicant – Primary SPPE Contact)	Chevron 1450 Marina Way S. Richmond, CA 94804-3747 (510) 242-9052 gcch@chevron.com
Bob Chamberlin Renewal Project Permitting Manager (Applicant)	Chevron Richmond Refinery 841 Chevron Way Tech Center, Room 329 P.O. Box 1272 Richmond, CA 94802 rtch@chevron.com
Paul Millner Manager – Business Development (Applicant)	Chevron Richmond Refinery 841 Chevron Way Admin, Room 314 Richmond, CA 94802 PAMR@chevron.com
David A. Stein, PE Vice President (Consultant - SPPE Project Manager)	CH2M HILL 155 Grand Avenue, Suite 1000 Oakland, CA 94612 (510) 587-7787 dstein@ch2m.com
Jerry Salamy Senior Project Manager (Consultant – SPPE Deputy Project Manager)	CH2M HILL 2485 Natomas Park Drive Suite 600 Sacramento, CA 95833 (916) 286-0207 jsalamy@ch2m.com
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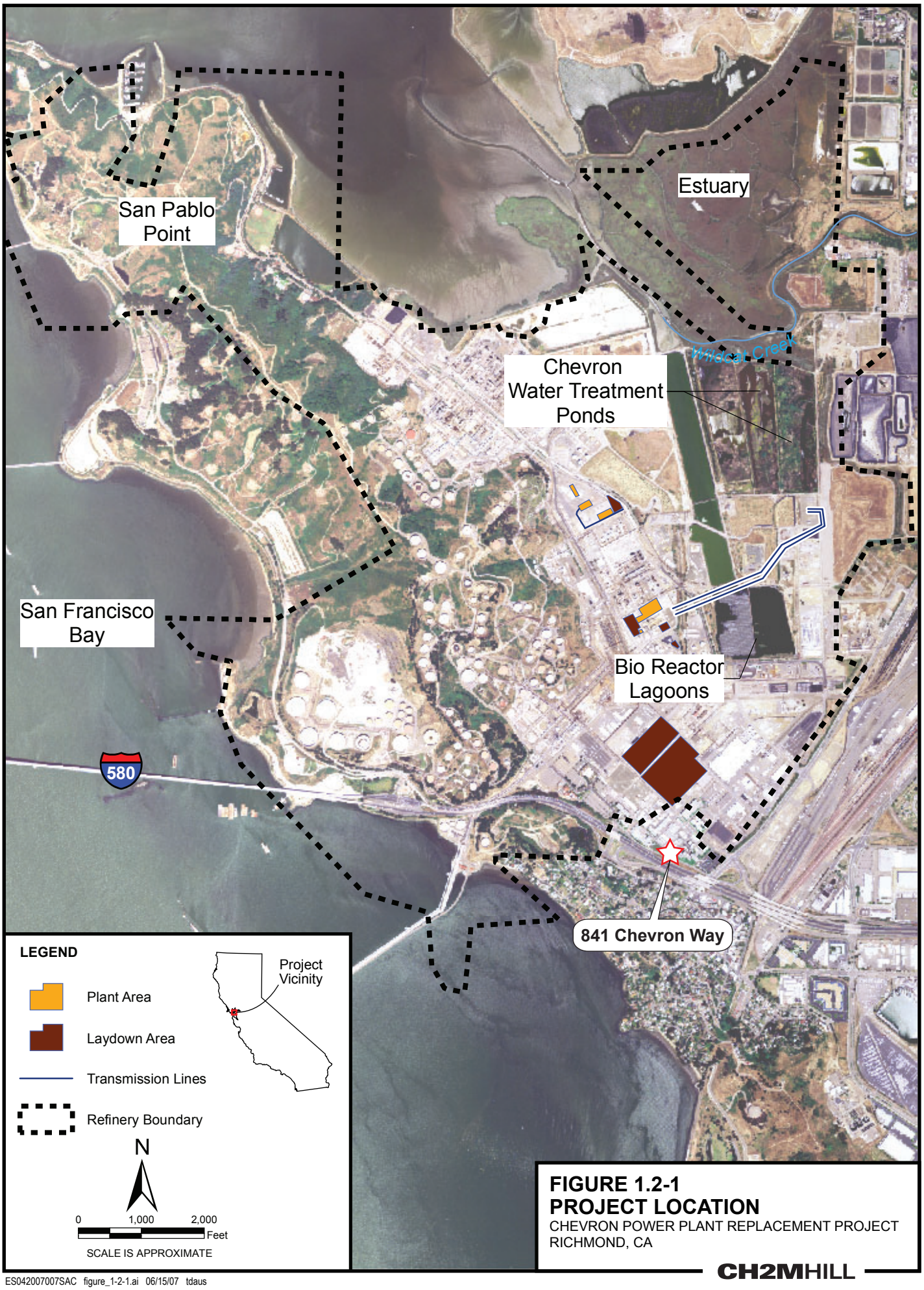

FIGURE 1.2-1
PROJECT LOCATION
CHEVRON POWER PLANT REPLACEMENT PROJECT
RICHMOND, CA

CH2MHILL

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