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01-AFC-12C
DATE OCT 30 2009
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October 30, 2009

Chris Davis
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California Energy Commission
Energy Facility Siting and Environmental
Protection Division
1516 9th Street, MS-2000
Sacramento, CA 95814

Subject: Los Esteros Critical Energy Facility (01-AFC-12C)
Amendment No. 4

Dear Mr. Davis:

In accordance with Section 1769 of the California Energy Commission Siting Regulations, Los Esteros Critical Energy Facility, LLC submits the attached Petition to Amend the Commission Decision in this proceeding. Per your instructions, we are enclosing ten (10) hard copies of the Amendment and five (5) CDs.

If you have any questions regarding this submittal please contact me at (916) 447-2166. If you need additional hard or electronic copies of any portion of this Amendment, please contact Karen Mitchell at kam@eslawfirm.com or (916) 447-2166.

Sincerely,

Greggory L. Wheatland
Attorneys for Los Esteros Critical Energy Facility, LLC

GLW/kam
enclosures

LOS ESTEROS CRITICAL ENERGY FACILITY AMENDMENT #4 For 01-AFC-12C

Prepared for
LOS ESTEROS CRITICAL ENERGY FACILITY, LLC

October 2009

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1.0 Introduction

1.1 Overview of Amendment

The Los Esteros Critical Energy Facility (LECEF or the Project) is a natural gas fired power plant located near the intersection of State Route 237 and Zanker Road in the City of San Jose. The facility consists of an operational 180 megawatt (MW) simple-cycle power plant (LECEF Phase 1) that is being converted to a 320 MW combined-cycle plant (LECEF Phase 2). Los Esteros Critical Energy Facility, LLC, hereinafter "Petitioner," is a wholly-owned indirect subsidiary of Calpine Corporation.

The Commission granted the original license for LECEF on July 2, 2002. (Commission Decision in 01-AFC-12, hereinafter "2002 Decision.") This three-year license covered construction and operation of LECEF Phase 1. In the original license, Petitioner was permitted to temporarily connect to the PG&E 115 kV line via an overhead "tap-line," and to permanently connect the Project via an underground interconnection once the then undeveloped PG&E Los Esteros Substation was constructed. (2002 Decision, p. 6.)

On December 30, 2003, Petitioner filed an Application for Certification with the Commission to continue operation of LECEF Phase 1 beyond June 30, 2005 and to convert LECEF Phase 1 to combined-cycle operation for LECEF Phase 2. The Commission handled these requests in two decisions. The Commission first approved Petitioner's request to relicense LECEF Phase 1 in March 2005. (Order No. 05-0316-04, adopting Commission Decision in 03-AFC-2, hereinafter the "2005 Decision.") The 2005 Decision also authorized LECEF to temporarily interconnect to PG&E's 115 kV Los Esteros-Nortech transmission line by a 152 foot overhead line (rather than permanently connect via an underground line) until the Project converted to combined-cycle operation. In the second decision, the Commission approved Petitioner's application to move forward with conversion of the Project to combined-cycle operation. (Order No. 06-1011-05, adopting Commission Decision in 03-AFC-2, hereinafter "2006 Decision.") As part of the combined-cycle conversion, Petitioner also sought and received authority to change the permanent point of interconnection from the underground line (connecting to the PG&E Los Esteros Substation, as approved in the 2002 Decision), to a 230 kV transmission line connecting to the Silicon Valley Power Substation.

Pursuant to Section 1769 of the Commission's Siting Regulations,[1] this Petition for Modification requests three changes to the 2006 Decision.

First, Petitioner requests that the 2006 Decision be amended to allow Petitioner to use an underground interconnection similar to what was authorized in the 2002 Decision.

Second, on July 28, 2009, the California Independent System Operation (CAISO) completed Transition Cluster Group 1 Phase I Interconnection Study Report for the LECEF Expansion Project, hereinafter "Interconnection Study." The Interconnection Study concludes that as a result of the Project's interconnection to the Los Esteros Substation a new breaker is required at

[1] California Code of Regulations, tit. 20, Section 1769.

the PG&E Los Esteros Substation, and PG&E must reconductor a 1.1 to 1.3 mile portion of the San Jose-Trimble 115 kV line. Reconductoring along the Trimble-San Jose B 115 kV line is a reasonably foreseeable indirect consequence of interconnecting LECEF Phase 2 to the PG&E transmission system.

The Petitioner has prepared a general assessment of the potential environmental effects of reconductoring approximately 1.1 to 1.3 miles of the 2.4 mile Trimble-San Jose B 115 kV line that addresses environmental and other impacts of the reconductoring process. (See Attachments A and B.) This environmental assessment is provided to assist the Commission in its analysis of the potential effects of the proposed interconnection of LECEF Phase 2 to the PG&E transmission system, and the assessment is prepared in order to satisfy the requirements of the California Environmental Quality Act (CEQA). The environmental assessment for the reconductoring of the Trimble-San Jose B line describes the process of reconductoring and the types of environmental impacts that might occur as a result of reconductoring. The assessment also discusses some specific aspects of the reconductoring, such as its location and some likely places for conductor pull and tensioning sites. Project-specific details regarding the locations of the pull and tensioning sites and the specific techniques that will be used for each span, however, will not available until the specific project is designed. The assessment concludes that this reconductoring project will be accomplished with no significant environmental impacts, as long as certain mitigation measures are followed by PG&E.

Third, Petitioner requests that the 2006 Decision be amended to lower the emission limits for carbon monoxide (CO) and Precursor Organic Compounds (POC). These reductions are necessitated by a requirement of the Bay Area Air Quality Management District's (Air District) rules, which provides that a facility's Authority to Construct (ATC) may be extended if the facility owner has not commenced construction within two years of the date of its issuance only upon assuring that the source meets current "Best Available Control Technology" (BACT) standards. This obligation to assure that a permitted source must periodically undergo review to confirm that it meets current BACT standards at the time of construction is a requirement of the federal Clean Air Act's regulations for nonattainment New Source Review. However, in light of the Commission's plenary jurisdiction over the siting and permitting of power plants, once the Commission has issued a license, no other State or local agency may impose additional or more stringent requirements. It therefore falls to the Commission to adopt any more stringent air quality conditions that may be required to meet current BACT. Based upon Petitioner's updated BACT analysis and a series of communications with the Air District, all emissions limits contained within the Commission's 2006 Decision meet current BACT, except for the limits on CO and POC, which must be reduced, respectively, to 2.0 ppm (1-hour average) and 1.0 ppm (1-hour average) to achieve current BACT. As set forth in the attached analysis (see Evaluation of Best Available Control Technology for LECEF 2, hereinafter "BACT Evaluation," provided herewith as Attachment B), Petitioner asserts that these proposed limits will achieve the current BACT standards. Petitioner, therefore requests modification of two Conditions of Certification: AQ-19 (subparts (c) and (d)) and AQ-22, as set forth below.

1.2 Summary of Environmental Impacts

Section 1769 (a)(1)(E) of the Commission Siting Regulations requires that an analysis be conducted that addresses the impacts a modification might have on the environment and

proposed measures to mitigate any significant adverse impacts. In addition, Section 1769 (a)(1)(F) requires a discussion of the impacts a modification might have on the project's ability to comply with applicable laws, ordinances, regulations and standards (LORS). Section 3.0 of this Amendment addresses potential environmental impacts and consistency of the modification with LORS for the proposed underground transmission interconnection. Section 4.0 of this Amendment provides the same analysis for the PG&E transmission system upgrades. Section 5.0 provides the same analysis for the revised BACT carbon monoxide limit.

Sections 3.0, 4.0, and 5.0 conclude that the amendments requested herein will not result in environmental impacts and that the Project, as amended, will comply with applicable LORS.

Operation of the underground line will not adversely alter or effect the environment. Petitioner requests that the Commission reinstate its previously granted approval of Petitioner's proposal to construct an underground line to the PG&E Los Esteros Substation.

Similarly, the breaker replacement and the partial reconductoring of the San Jose-Trimble 115 kV line, will not adversely affect the environment. As described below, the replacement of conductors along the line is a limited construction activity of short duration. Except where it may be necessary to replace an existing damaged pole or tower, which is not anticipated at this time, reconductoring will not involve ground disturbance. Considering the anticipated selection of tensioning sites and with a range of mitigation measures that will be employed, the reconductoring of the line will not result in any significant adverse impact. Moreover, because the reconductored line will have the same visual appearance as the existing line, the operation of the reconductored line will also have no significant adverse environmental impact.

The proposed amendments to the air quality conditions of the 2006 Decision will not result in an adverse change in the environment. Actually, the resulting change will be beneficial, because it will lower the emission limits for CO and POC from the limits that were previously approved.

1.3 Consistency of Amendment with License

Section 1769 (a)(1)(D) of the Commission Siting Regulations requires a discussion of whether the proposed modifications are based upon new information that changes or undermines the assumptions, rationale, findings, or other bases of the final decision. This section also seeks an explanation of why the requested changes should be permitted.

The amendments requested herein are consistent with the 2002, 2005 and 2006 Decisions.

Petitioner's request to reinstate approval of the underground line is consistent with the Commission's 2002 Decision and 2006 Decision because it is an interconnection that was previously approved by the Commission and because the underground line remains an effective, environmentally preferable means of interconnection. Construction of the underground line will be subject to the Transmission System Engineering (TSE) conditions provided in the 2006 Decision.

The reconductoring of the San Jose-Trimble line is consistent with the 2002 Decision, which anticipated the need for further consideration of the impact of the Phase 2 expansion to the PG&E transmission system upon interconnection to the PG&E's Los Esteros Substation. (See generally, 2002 Decision, pp. 77-82.) In particular, at the time of the 2002 Decision, the CAISO

could only conditionally approve the Project's connection to the Los Esteros Substation due to the uncertainly resulting from the yet undeveloped substation, the uncertainty in the future system configuration, and uncertainty regarding the development of new generation facilities in the area. (2002 Decision, p. 81.) Because this Petition provides information regarding conditions unknown at the time of the 2002 Decision, it is consistent with the intent of the decisions licensing the Project.

The proposed modifications to the air quality conditions are consistent with the 2006 Decision because they achieve the Commission's goal of ensuring that new power plants meet BACT for all criteria pollutants.

2.0 Description of Project Amendments

Consistent with California Energy Commission Siting Regulations Section 1769 (a)(1)(A) and 1769(a)(1)(B), this section includes a complete description of the project modification, as well as the necessity for the amendments.

2.1 Project Description

Underground Transmission Line

Currently, LECEF is interconnected to PG&E's Los Esteros-Nortech 115 kV circuit by way of a 152 foot overhead transmission line. Petitioner requests that the Commission reinstate the 2002 Decision's approval of Petitioner's proposed permanent underground interconnection to the PG&E Los Esteros Substation. This proposed electrical transmission interconnection will connect LECEF to PG&E's grid by way of two new underground three-phase, single-circuit, solid-dielectric, copper-conductor circuits between LECEF's Air Insulated Substation (AIS) and the adjacent Los Esteros 115 kV switchyard. (Figure 2.1-1.) As a result of LECEF's physical proximity to the Los Esteros Substation site, the two transmission circuits will exit the switchyard underground and run to the northwest for approximately 400 feet where they will resurface and be connected to the 115 kV switchyard. Figure 2.2-1 shows the location of the preferred electrical interconnection arrangement. The two 115 kV circuits will each be rated to allow for the removal of one of the circuits without limiting plant output.

The interconnection will not require an additional right-of-way. The underground line will run under property owned by Petitioner, PG&E and the City of Santa Clara. Petitioner granted the City of Santa Clara this property in 2003,[2] and the grant deed reserved an easement for underground lines. An electrical one-line diagram of the proposed LECEF to the Los Esteros Substation interconnection appears on Figure 2.2-2. Each circuit will be comprised of two (2) solid-dielectric, 2500 kcmil, copper conductors per phase. Each conductor will be installed in a separate underground conduit. The conduit system will begin beneath the LECEF AIS, run northwest, and resurface within the Los Esteros 115 kV switchyard. Once aboveground within the Los Esteros Substation, the 115 kV circuits will be connected to existing 115 kV facilities. (See Figure 2.2-2.)

Upgrades to the PG&E Transmission System

Pursuant to the Interconnection Study, LECEF Phase 2 will require two upgrades to PG&E's transmission system. PG&E is responsible for performance of the upgrades, and Petitioner is responsible for the refundable cost of these upgrades. First, the proposed interconnection of LECEF Phase 2 to the PG&E Los Esteros Substation overstresses a circuit breaker, identified as San Jose "B" Substation 115 kV CB132, and this breaker must be replaced. The second, and more significant upgrade, is the reconductoring of approximately 1.1 to 1.3 miles of the 2.4 mile Trimble-San Jose B 115 kV transmission line.

[2] Silicon Valley Power currently operates a substation on the indicated property.

The San Jose B – Trimble 115kV transmission line carries two 115 kV electrical circuits between the Trimble Substation, located in San Jose, Santa Clara County, and the San Jose B Substation take-off structure in San Jose, Santa Clara County, California. For the LECEF Phase 2, approximately 1.1 to 1.3 miles of the 115 kV transmission line from the Trimble Substation to Pole 12/81 (Line A), and 0.07 mile of the 115 kV transmission line of Pole 3/23 to the San Jose B Substation takeoff structure (Line B) will need to be reconductored (Figure 2.2-3).

Line A begins at the Trimble Substation take-off structure and runs southwest in the center meridian of Component Drive. The line continues southwest through the intersection of Orchard Parkway and Component Drive through undeveloped fields for 0.45 miles until it reaches a pole adjacent to the Guadalupe River. At this point, the line turns south/southeast for approximately 0.31 miles, crossing Highway 101, just west of the intersection of Highway 101 and Highway 87/Guadalupe Parkway. The line continues in a generally southeast direction crossing the car rental facility for the San Jose International Airport, and running generally parallel to Guadalupe Parkway for 0.25 miles. The line then continues southeast through the car rental facility, running adjacent to the Guadalupe River for 0.18 mile, and eventually crossing the canal to its terminus at pole 12/81, which is located north of Brokaw Road, east of Airport Road, and west of Guadalupe Parkway. Along this portion of the route, the towers are located in medians, parking lots, wooded riparian areas, and fallow fields.

Line B begins at pole 3/23 located north of Coleman Road, and East of Vendome Road, and heads east to the San Jose Substation Take off structure located 0.07 miles to the east of Pole 3/23. The towers are located at the interface between Vendome Road and cross over a landscaped area to the San Jose Substation takeoff structure which is located within a paved area.

Reconductoring of a transmission line involves the replacement of existing electrical transmission wire (conductor) with new wire. To make this replacement, the old conductor must be pulled back through the existing transmission tower supports to a takeup reel. If the existing wire is in good condition, then it is also used to pull in the new conductor, by attaching the two together. Otherwise, the existing wire is used to pull a carrier cable, or sock line onto the tower sheaves. The new conductor is then pulled back through the same supports from the opposite direction from a pull and tensioning site at the other end of the stringing segment. In order for the old line to be reeled off the towers, it must be first disconnected from its insulator clamps and placed on sheaves blocks (pulleys) or travelers that hang from the towers spars. The new line is pulled back through the sheave blocks. Workers then remove the new conductor from the sheaves and attach it to the structure.

Due to limits in the size of conductor reels, the reconductoring must be staged between tower sites that are called deadends. Deadends are towers where the line running in each direction is securely attached to, rather than passing through, the tower support. If deadends are too far apart or terrain interferes, shorter line segments may be chosen. Deadends are often placed at angle towers, where the lines change direction.

Activities between the pull and tensioning sites are generally restricted to (1) accessing the towers (manually by climbing or using a truck-mounted aerial bucket) to place the pulleys, or sheaves blocks, through which the conductor is pulled once it is disconnected and to remove the conductor from the sheave blocks and refasten it once stringing is completed; and (2) work on the tower structure itself to repair or replace spars that are damaged.

Air Quality

LECEF currently consists of four natural gas-fired LM6000PC simple-cycle combustion turbines with a combined nominal output of 180 MW, a fire pump diesel engine, and a one-cell cooling tower. The modified LECEF facility, as approved by the Commission, will have a nominal output of 320 MW as a result of the addition of one nominal 140 MW steam turbine generator.

The LECEF Phase 2 project is required to use BACT to control the emissions of various pollutants from the combustion turbines, in accordance with the requirements of the Air District's New Source Review program. The applicability of BACT requirements under the Air District regulations is discussed in Air District Regulation 2, Rule 2, Section 206. Petitioner has prepared an updated BACT analysis for the combined cycle conversion project and has discussed this analysis with, and obtained the concurrence of Air District staff. (See Attachment C.) The emission rates and control technologies determined to be BACT for LECEF Phase 2 are discussed in detail in this analysis. Separate determinations are provided for normal operation and for startup/shutdown operation.

Petitioner has recently replaced the Selective Catalytic Reduction (SCR) catalyst for each of the four turbines due to poor performance, and the current design calls for the heat recovery steam generators (HRSGs) to be replaced as well. Petitioner also expects to install a new oxidation catalyst as part of the combined cycle conversion. In light of these changes, Petitioner now believes that a CO limit of 2 ppm (1-hour average) and a POC limit of 1 ppm (1-hour average) are achievable for LECEF Phase 2.

The proposed changes in the conditions of certification that will implement this reduction are set forth in Section 5.

2.2 Necessity of Proposed Changes

The proposed modifications related to the undergrounding of a permanent transmission line are necessary to allow continued reliable interconnection between LECEF Phase 2 and the PG&E transmission system. In addition, Petitioner prefers that the Project remain permanently connected to the Los Esteros Substation, rather than move to connect to the Silicon Valley Power Substation, as authorized in the 2006 Decision.

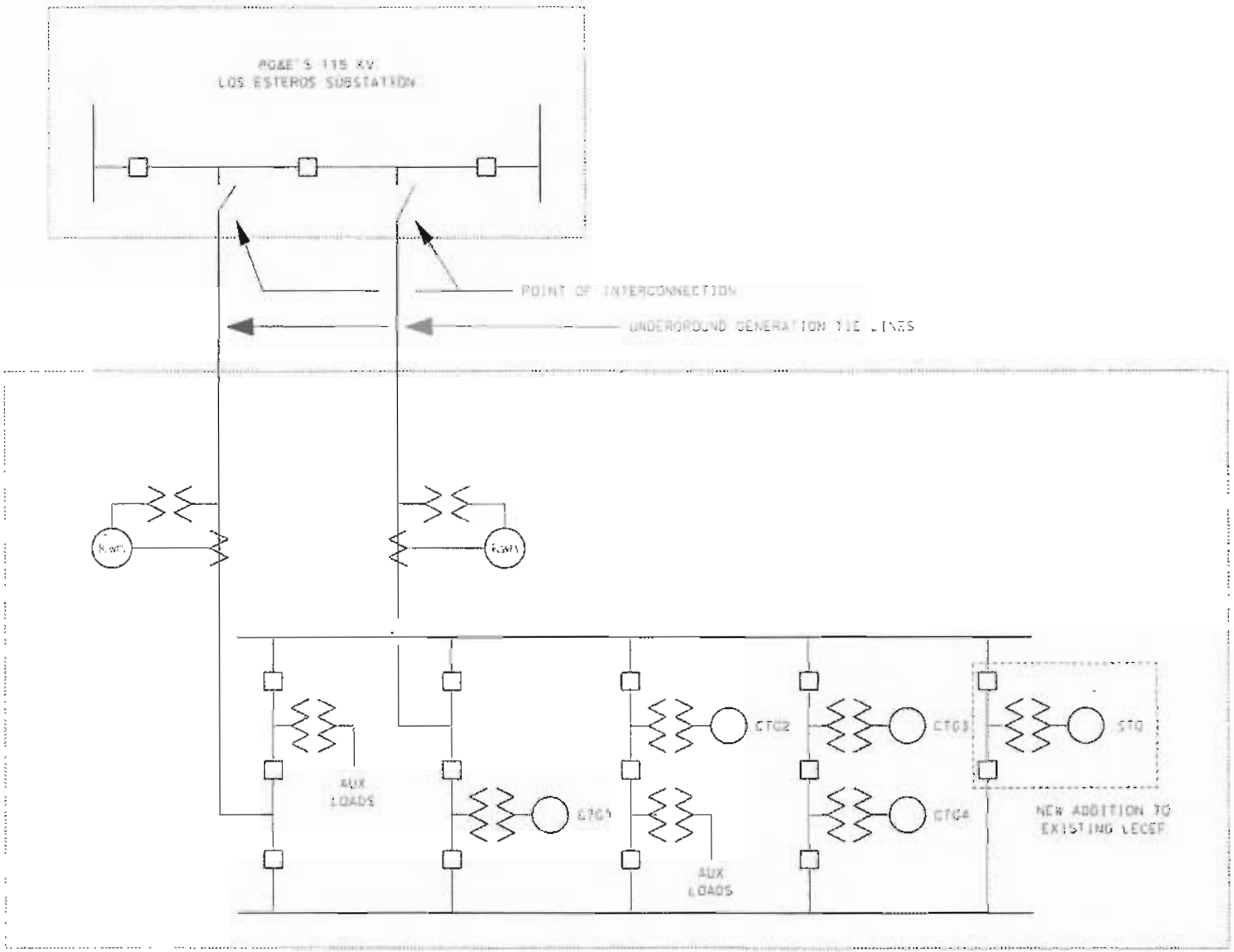
This amendment also addresses the impact of LECEF Phase 2's interconnection to the Los Esteros Substation, which has been analyzed by CAISO. Unlike the circumstances at the time of the 2002 Decision,[3] the PG&E system upgrades attributable to the Project are now known. While this information does not affect any conditions of certification, it is new information that assists the Commission in its overall analysis of the potential effects of LECEF Phase 2.

[3] In 2002 CAISO's approval of the LECEF interconnection was conditional "because of uncertainty in the future system configuration and uncertainty in the development of other new generation plants in the area. In large part, these uncertainties are tied to the Los Esteros Substation development and are not related to Applicant's temporary tap-line connection to PG&E's Nortech-Trimble 115 kV transmission line." (2002 Decision, p. 81.) Also, the 2006 Decision did not fully address CAISO transmission system impacts because the 2006 Decision considered LECEF's proposed interconnection to the Silicon Valley Power system, which is not a part of the CAISO grid. (2006 Decision, p. 111.)

The proposed air quality modification to the CO and POC emission limits are necessary to achieve the current BACT standard. These reductions are necessitated by the Air District's rules which provide that where a facility has not commenced construction within two years of the date of issuance of its Authority to Construct, the District may extend the Authority to Construct for another two-year period, but only upon finding that the source continues to meet the current BACT standards and offset requirements. (District Reg. 2-1-407.1.2.) This obligation to assure that a permitted source must periodically undergo review that it will meet current BACT standards implements the federal Clean Air Act's regulations for nonattainment New Source Review.

In deference to the Commission's plenary jurisdiction over the permitting of power plants, the Air District, as a ministerial act, issues an Authority to Construct to a power plant subject to the Commission's jurisdiction. The Authority to Construct incorporates the exact conditions of certification which appear within the Commission's Decision and thereby render them directly enforceable by the Air District. (District Reg. 2-3-405.) This is because, once the Commission's decision is final, no other State or local agency may impose additional or more stringent permitting requirements on the facility. (Cal. Public Resources Code § 25500.) Because the Air District may not, of its own volition, adopt additional or more stringent requirements than appear within the Commission's Decision, it falls to the Commission to adopt any more stringent air quality conditions that are necessary to assure that the facility continues to meet BACT.

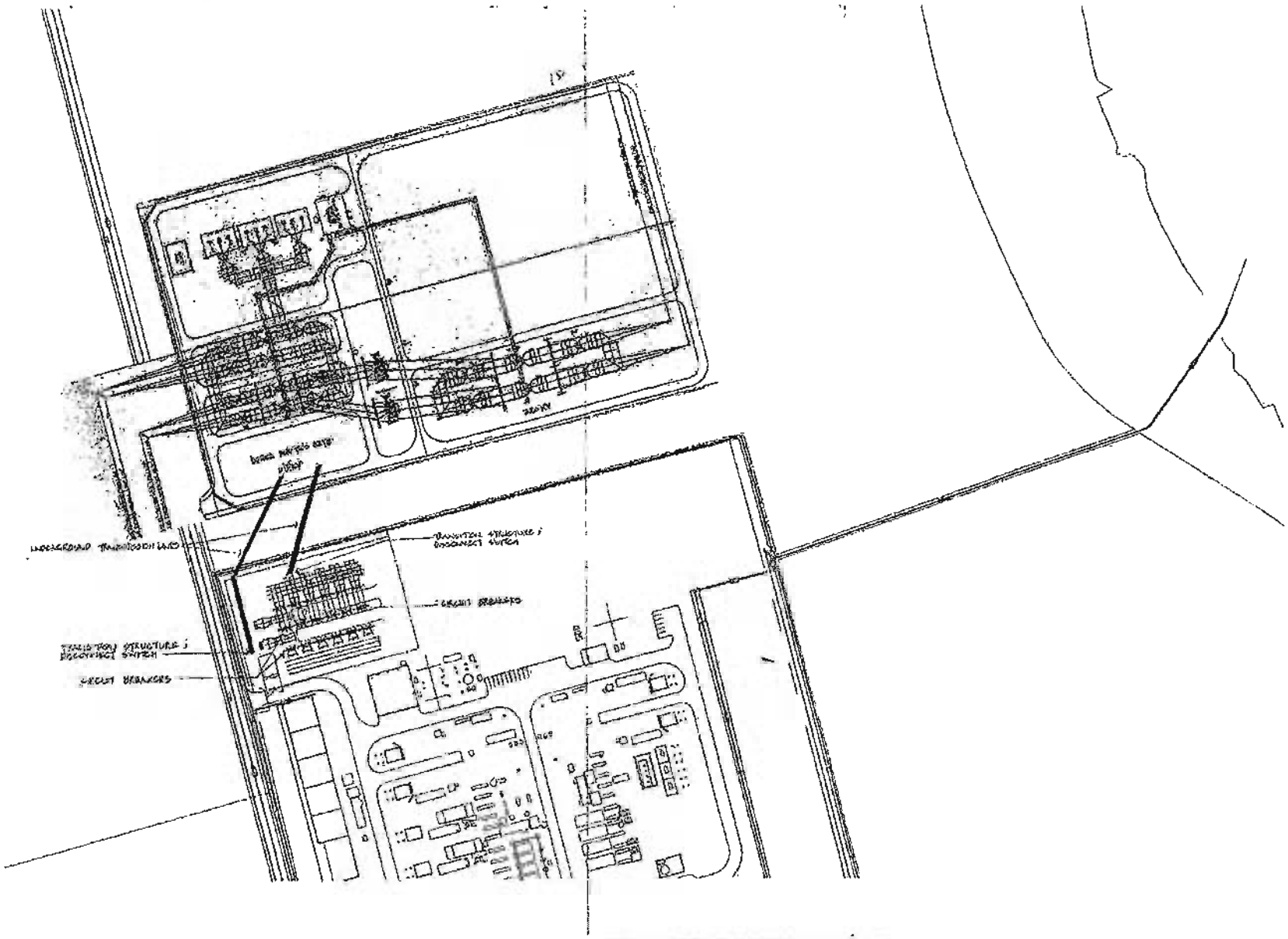
Based upon this updated analysis, we believe that all the emissions limits contained within the 2006 Decision meet current BACT, except for the limit on CO and POC. Rather, based upon the updated analysis, Petitioner asserts that, for CO, 2.0 ppm (1-hour average) and, for POC, 1.0 ppm (1-hour average) constitutes the current BACT standard for this source category. As set forth in the attached analysis (see Evaluation of Best Available Control Technology for LECEF 2, hereinafter "BACT Evaluation," provided herewith as Attachment B), Petitioner asserts that the proposed limits will achieve the current BACT standards. Petitioner, therefore requests modification to Conditions of Certifications AQ-19(c), AQ-19(d) and AQ-22, as set forth below.



LOS ESTEROS CRITICAL ENERGY FACILITY

Figure 2.2-1

q/r 9/09



Los Esteros Expansion - Underground Gen-Tie

Figure 2.2-2

LEGEND

- TRANSMISSION LINE A
- TRANSMISSION LINE B
- SAN JOSE SUBSTATION
- TRIMBLE SUBSTATION

N

0 1,500 3,000

Feet

VICINITY MAP

FIGURE 2.2-3
RECONDUCTORING ROUTE
LOS ESTEROS CRITICAL ENERGY FACILITY AMENDMENT
SAN JOSE, SANTA CLARA COUNTY

3.0 Environmental Analysis of the Project Changes Related to Construction of the Underground Line

The proposed modification is to allow construction and use of an underground transmission line to the PG&E Los Esteros-Nortech 115 kV circuit. The proposed modification does not result in any permanent physical change to the natural environment. When the Commission originally approved this underground transmission line in the 2002 Decision, the Commission thoroughly examined the environmental impacts of the proposal and found that there would be no significant adverse impacts. For these reasons and others described below, the proposed modification will not result in any environmental impacts.

3.1 Air Quality

Construction of an underground transmission line from LECEF to the PG&E Los Esteros Substation will not result in any significant air emission impacts. Air emission impacts from the construction of the overall Project, including the underground line were considered in the 2002 Decision and not found to be significant. (See 2002 Decision, pp. 124-135.) There will be no air quality impacts from operation of the underground line.

3.2 Biological Resources

The construction and operation of the underground transmission line from LECEF to the PG&E Los Esteros Substation will not result in any biological resource impacts. As explained in the original Commission approval of the Project, the proposed underground connection is considered "short" at 220 feet, and it occurs on land already disturbed during construction of the Project and the Substation. (2002 Decision, p. 194 fn. 100.) Thus, "[n]o biological resources [will] be affected." (*Id.*)

3.3 Cultural Resources

The construction and operation of the underground transmission line from LECEF to the PG&E Los Esteros Substation will not result in any cultural resource impacts. During construction, the Petitioner will comply with any applicable Cultural Resource Conditions in the 2006 Decision.

3.4 Land Use

The underground line and interconnection to the Los Esteros Substation will not require additional right-of-way. The underground line will run under property owned by Petitioner, PG&E and the City of Santa Clara. Petitioner granted the City of Santa Clara this property in 2003, and the grant deed reserves an easement for the underground lines. The

proposed interconnection is on land that is zoned for industrial development and is appropriately zoned for the transmission lines and power plant. The interconnection will be contained entirely within the LECEF and Los Esteros Substation fences, resulting in no additional right-of-way to be acquired at these locations. Thus, the construction and operation of the underground transmission line will not result in any land use impacts.

3.5 Noise

The construction and operation of the underground transmission line will not result in any measurable increase in noise impacts over the existing noise environment.

3.6 Public Health

The operation of the underground transmission line will not result in any criteria or toxic air pollutants. Prior studies conducted by Petitioner show that construction-related emissions of particulate matter from diesel-fueled construction equipment would not produce adverse health effects.[4] (2002 Decision, p. 156.)

Furthermore, undergrounding of transmission lines results in the lowest electric and magnetic field intensities possible, resulting in no public health impacts from the use of the underground transmission line. (See 2002 Decision, p. 91.)

3.7 Worker Safety and Health

The construction and operation of the underground transmission line will not result in any worker safety and health impacts.

3.8 Socioeconomics

The construction and operation of the underground transmission line will not result in any socioeconomic impacts.

3.9 Agriculture and Soils

The construction and operation of the underground transmission line will not result in any soil and agricultural impacts.

3.10 Traffic and Transportation

The construction and operation of the underground transmission line will not result in any traffic and transportation impacts.

[4] This discussion does not separate out the individual effect of underground transmission line construction. However, Petitioner maintains that compliance with the existing construction standards is more than sufficient to mitigate any environmental impacts of the underground line construction.

3.11 Visual Resources

The construction and operation of the underground transmission line will not result in any adverse visual resource impacts. Visual quality will be slightly improved by removal of the short overhead line that currently connects these facilities.

3.12 Hazardous Materials Management

The construction and operation of the underground transmission line will not involve the use of any additional hazardous materials not already addressed in prior decisions.

3.13 Waste Management

Any construction waste generated by the construction of the transmission line will be disposed of appropriately according to current regulations. The operation of the underground transmission line will not generate waste materials.

3.14 Water Resources

The construction and operation of the underground transmission line will not result in any water resource impacts.

3.15 Geologic Hazards and Resources

The construction and operation of the underground transmission line will not result in any geologic hazard and resource impacts.

3.16 Paleontological Resources

The construction and operation of the underground transmission line from LECEF to the PG&E Los Esteros Substation will not result in any paleontological impacts.

3.17 Transmission Interconnection Study

At the time of the 2002 Decision, an Interconnection Study for the LECEF Phase 2 expansion was not yet needed, and could not have been conducted due to the fact that Los Esteros Substation had not been developed and other relevant future conditions were not known. However, the Commission anticipated the need for such study, as shown by the following discussion in the 2002 Decision:

> The interconnection of a new generator (and any associated modifications to the transmission system), if not properly designed and operated, could adversely impact the reliable operation of the state's electrical power system. The primary roles of the Cal-ISO, as they pertain to the interconnection of new generation, are to ensure and to coordinate the reliable operation of the Cal-ISO controlled electrical grid.

> To achieve these goals, the Cal-ISO coordinates the planning of modifications to the grid to ensure they meet the Cal-ISO's Grid Planning Criteria. These criteria essentially incorporate all Western Systems Coordinating Council (WSCC) Reliability Criteria, the North American Electric Reliability Council (NERC) Planning Standards, and local-area-reliability-criteria. Commission staff relies on the Cal-ISO's determinations in formulating recommendations to the Commission. The Commission's review process includes Cal-ISO's determinations concerning conformance with applicable reliability standards, as well as the need for additional transmission facilities and any attendant environmental review necessitated by a particular project.
>
> On June 21, 2001, Cal-ISO gave its preliminary approval for LECEF after reviewing the project's interconnection and costs reports prepared by PG&E, which owns the transmission system. On March 1, 2002, the Cal-ISO granted a conditional final approval based on its review of PG&E's Final Cost Report. The Cal-ISO concurred with PG&E's findings that interconnection of the LECEF generation project would not require the addition of downstream transmission facilities while temporarily connected to PG&E's Nortech-Trimble 115 kV transmission line.
>
> The Cal-ISO's approval was conditional because of the uncertainty in the future system configuration and uncertainty in the development of other new generation plants in the area. In large part, these uncertainties are tied to the Los Esteros Substation development.... (2002 Decision, pp.80-81, citations omitted.)

On July 28, 2009 CAISO completed a Transition Cluster Group 1 Phase I Interconnection Study Report for the LECEF Expansion Project. The Interconnection Study was completed in coordination with PG&E per CAISO Tariff Appendix Y Large Generator Interconnection Procedures (LGIP) for Interconnection Requests in a Queue Cluster Window. This Interconnection Study represents a new planning process. Under this process, interconnection requests are processed together in clusters. Transition cluster projects are grouped for study purposes according to their geographical locations.

This Interconnection Study provides the following:

1. Transmission system impacts caused by the addition of the Group 1 projects,

2. System reinforcements necessary to mitigate the adverse impacts of the Group 1 projects under various system conditions,

3. Preliminary evaluation on the feasibility of the Group 1 projects on the CAISO Controlled Grid, and

4. A list of required facilities and a non binding, good faith estimate of LECEF's cost responsibility and time to construct these facilities.

As discussed throughout this Amendment, the Phase I Interconnection Study attributes two particular transmission system upgrades to LECEF Phase 2: the partial reconductoring of the 115 kV transmission line and the replacement of a circuit breaker at PG&E's Los Esteros Substation.

Following completion of the Interconnection Study, projects must post financial security within 90 calendar days. For those projects that post financial security, the CAISO then prepares a Phase II Interconnection Study. The Phase II Interconnection Study updates analyses performed in the Phase I Interconnection Study to account for the withdrawal of any projects in the cluster and assigns specific cost responsibility for necessary system upgrades. Following the completion of the Phase II Interconnection Study for LECEF, Petitioner will enter into a three party interconnection agreement with the CAISO and PG&E.

3.18 Transmission Line Safety and Nuisance

The 2002 Decision concluded that the LECEF transmission lines, including the underground lines, will not create any safety or nuisance hazards. Based upon the uncontroverted evidence of record, the 2002 Decision found:

> 1. The proposed transmission line to be constructed in conjunction with the proposed project is not likely to create fire hazards nor to cause safety hazards to aviation.
>
> 2. The electric and magnetic field strengths created by the project's transmission lines will be within acceptable limits, and will not create significant adverse human health impacts.
>
> 3. The project's transmission lines will not cause an unacceptable interference with radio frequency communications, nor create significant shock hazards to humans.
>
> 4. The Conditions of Certification below will ensure that the transmission lines are designed, constructed, and operated in compliance with the applicable laws, ordinances, regulations, and standards specified in the appropriate portion of Appendix A of this Decision. (2002 Decision, p. 91)

These findings remain valid.

3.19 Cumulative Impacts

Because the underground transmission line will not result in any adverse environmental impacts, it will not result in any cumulative adverse effects.

3.20 Laws, Ordinances, Regulations, Standards

The construction and operation of the underground transmission line from LECEF to the PG&E Los Esteros Substation will be in conformance with all applicable LORS.

4.0 Environmental Analysis of the Project Changes Related to Upgrades to the PG&E Transmission System Attributed to the Project

The Petitioner has prepared a general assessment of the potential environmental effects of reconductoring the 1.1 to 1.3 miles of the 2.4 mile Trimble-San Jose B 115 kV line and of the installation of the new breaker. This analysis was prepared to assist the Commission in its analysis of the potential effects of the proposed interconnection of LECEF Phase 2 to the PG&E transmission system. The new breaker and partial reconductoring of the Trimble-San Jose B 115 kV line are reasonably foreseeable indirect consequences of interconnecting LECEF Phase 2 to the PG&E transmission system, and the Commission has a responsibility under CEQA to evaluate the "project as a whole." (See 14 C.C.R. 15051.) Permitting of these actions falls under the jurisdiction of the California Public Utilities Commission because they will take place beyond the first point of LECEF's interconnection with the electric grid. However, the information set forth in this amendment assists the Energy Commission in fulfilling its obligation as the lead agency under the California Environmental Quality Act (CEQA). Therefore, while the Energy Commission does not have permit authority over the reconductoring of the transmission line, this assessment is prepared to satisfy the requirements of CEQA.

Targeted assessments of the biological and cultural effects of the partial reconductoring are provided herewith as Attachments A and B. These assessments briefly describe the process of reconductoring and discuss impacts that might occur as a result of the partial reconductoring. These assessments also detail some specific aspects of the reconductored line segment, such as its location and some likely places for conductor pull and tensioning sites. Project-specific details regarding the locations of the pull and tensioning sites and the specific techniques that will be used for each span, however, will not be available until the specific project is designed. We do not provide a detailed discussion of impacts on issues such as visual resources or noise, since there is no possible environmental impact on these topics.

The “Preliminary Biological Site Assessment for Los Esteros Critical Energy Facility Reconductoring of the Trimble-San Jose B 115kV Transmission Line,” hereinafter “Biological Assessment,” describes potential biological impacts associated with ground-disturbing activities related to the partial reconductoring of the Trimble-San Jose B 115kV transmission line. (See Attachment A.) The Biological Assessment concludes that the reconductoring should not have any significant effect on the biological resources with the indicated avoidance and mitigation measures. Among the mitigation measures proposed are additional pre-construction surveys for rare plants, pond turtles, bats, migratory bird nests, and habitable owl burrows. Formal wetland and riparian canopy deliniations are recommended to assess potential impacts to Guadalupe River channel wetlands and waters, and the river canopy. Also, prior to daily activity, a biological monitor is needed to clear areas where reconductoring activities will take place in order to avoid disturbance of special-status species.

The Biological Assessment also calls for an Initial Study/Mitigated Negative Declaration under CEQA §15060 guidelines to be prepared prior to the reconductoring effort for potentially significant impacts to sensitive biological resources. Resources identified as having potential significant impacts include sensitive natural communities, special-status plants, special-status fish species, special-status nesting birds, migratory birds, and roosting bats.

The "Los Esteros Critical Energy Facility (LECEF); Cultural Resources Assessment" (Attachment B) is provided to address the potential impacts to cultural resources from the project. This assessment explains that the archaeological sensitivity for the reconductoring project is low due to a low degree of ground disturbance and the modern built environment surrounding the reconductoring activities. Significant archaeological and historical sites were not found during the survey. The pedestrian assessment conducted by the cultural resources analyst did not reveal evidence of cultural materials as the area consists mainly of previously disturbed agricultural sediments and road bed material. Although the cultural sensitivity is low, and further considering that the reconductoring effort is not expected to require subsurface construction, if there is an inadvertent discovery of buried cultural resources then mitigation measures are provided.

As shown by the biological and cultural resource assessments, and the discussions herein, the reconductoring project will be accomplished with no significant environmental impacts, as long as certain mitigation measures are followed.

5.0 Environmental Analysis of the Project Changes Related to the Revised Carbon Monoxide and Precursor Organic Compounds Emission Limits

The proposed modifications to Air Quality Conditions of Certification AQ-19(c) in the 2006 Decision will lower the CO emission limit to 2.0 ppm (1-hour average). The modification to AQ-19(d) will lower the POC emission limit to 1.0 ppm (1-hour average). The proposed modifications to AQ-22 will make corresponding changes to the hourly, daily and annual mass emissions limitations to reflect these updated BACT limits. These proposed modifications do not result in new construction or other physical changes to the environment and do not negatively impact air quality or public health. In fact, these proposed modifications will result in a beneficial change by adopting an emission limit substantially lower than the limit set in the 2006 Decision.

6.0 Proposed Modifications to the Conditions of Certification Related to the Requested Amendments

Consistent with the requirements of the Commission Siting Regulations Section 1769 (a)(1)(A), this section addresses the proposed modifications to the Project's Conditions of Certification.

Underground Transmission Line

In regards to construction and operation of the underground line, this petition requests that the Commission reinstate its prior approval of construction and operation of the underground transmission line from LECEF to PG&E's Los Esteros Substation.

Upon approval of the underground lines, the Conditions of Certification for Transmission System Engineering (TSE) in the 2006 Decision will be applicable to the underground lines. However, it will be necessary to amend Conditions of Certification TSE-5 and TSE-7 to remove the references to Silicon Valley Power Substation (SVP) and, in certain instances, substitute reference to CAISO, as follows:

TSE-5 The Petitioner 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 Petitioner shall submit the required number of copies of the design drawings and calculations 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", Cal-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 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) Termination facilities shall comply with applicable ~~SVP~~ Cal-ISO interconnection standards.

e) The project conductors shall be sized to accommodate the full output from the project.

f) The Petitioner shall provide to the CPM:

i) Any Facility Study, Detailed Facility Study (DFS) or System Impact Study completed after December 2, 2004, including, if applicable, a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing,

ii) An executed Petitioner, PG&E, and Cal-ISO ~~Facility~~ Large Generator Interconnection Agreement.

g) The Petitioner shall remove the overhead conductors of the existing tap line and remove the supporting poles.

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 Petitioner and CBO), the Petitioner 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"[footnote omitted] 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 g) above.

d) The final DFS, including a description of facility upgrades, operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to the CPM and the CBO.

TSE-7 The Petitioner shall provide the following Notice to the California Independent System Operator (Cal-ISO) and ~~SVP~~ PG&E prior to synchronizing the facility with the California transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization; and

2. At least one (1) business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the ISO Outage Coordination Department.

Verification: The Petitioner shall provide copies of the Cal-ISO letter to the CPM and ~~SVP~~ PG&E when it is sent to the Cal-ISO one (1) week prior to initial synchronization with the grid. The Petitioner shall contact the Cal-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 Cal-ISO shall be provided electronically to the CPM one (1) day before synchronizing the facility with the California transmission system for the first time.

Upgrades to the PG&E Transmission System

The impact of LECEF Phase 2 to the transmission system, and the related upgrades identified by the Interconnection Study, do not require modification of any conditions of certification.

Air Quality

Petitioner requests that Air Quality Conditions of Certification 19(c) and 22 be revised as follows:

AQ-19 Emissions Limits: The owner/operator shall operate the facility such that none of the following limits are exceeded:

a. The emissions of oxides of nitrogen (as NO2) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 2.0 ppmvd @ 15% O2 (1-hour rolling average), except during periods of gas turbine startup and shutdown as defined in this permit. The NOx emission concentration shall be verified by a District-approved continuous emission (Basis: BACT.)

b. Emissions of ammonia from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 10 ppmvd @ 15% O2 (3-hour rolling average), except during periods of start-up or shutdown as defined in this permit. The ammonia emission concentration shall be verified by the continuous recording of the ratio of the ammonia injection rate to the NOx inlet rate into the SCR control system (molar ratio). The maximum allowable NH3/NOx molar ratio shall be determined during any required source test, and shall not be exceeded until reestablished through another valid source test. (Basis: BAAQMD Toxics Risk Management Policy.)

c. Emissions of carbon monoxide (CO) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed ~~9~~ 2.0 ppmvd @ 15 % O2 (~~3~~ 1-hour rolling average), except during periods of start-up or shutdown as defined in this permit. The CO emission concentration shall be verified by a District-approved CEMS and during any required source test. (Basis: BACT.)

d. Emissions of precursor organic compounds (POC) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed ~~2~~ 1 ppmvd @ 15% O2 (~~3~~

1-hour rolling average), except during periods of gas turbine startup or shutdown as defined in this permit. The POC emission concentration shall be verified during any required source test. (Basis: BACT.)

e. Emissions of particulate matter less than ten microns in diameter (PM10) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 2.5 pounds per hour. The PM10 mass emission rate shall be verified during any required source test. (Basis: BACT & cumulative increase.)

f. Emissions of oxides of sulfur (as SO2) from emission points P-1, P-2, P-3, and P-4 (combined exhaust of gas turbine/HRSG power trains S-1 & S-7, S-2 & S-8, S-3 & S-9, and S-4 & S-10, respectively) each shall not exceed 1.8 pounds per hour. The SO2 emission rate shall be verified during any required source test. (Basis: BACT & cumulative increase.)

g. Compliance with the hourly NOx emission limitations specified in part 19(a), at emission points P-1, P-2, P-3, and P-4, shall not be required during short-term excursions, limited to a cumulative total of 320 hours per rolling 12 month period for all four sources combined. Short-term excursions are defined as 15-minute periods designated by the Owner/Operator that are the direct result of transient load conditions, not to exceed four consecutive 15-minute periods, when the 15-minute average NOx concentration exceeds 2.0 ppmv, dry @ 15% O2. Examples of transient load conditions include, but are not limited to the following:

(1) Initiation/shutdown of combustion turbine inlet air cooling
(2) Initiation/shutdown of combustion turbine water mist or steam injection for power augmentation
(3) Rapid combustion turbine load changes
(4) Initiation/shutdown of HRSG duct burners
(5) Provision of ancillary services and automatic generation control at the direction of the California Independent System Operator (Cal-ISO)

The maximum 1-hour average NOx concentration for short-term excursions at emission points P-1, P-2, P-3, and P-4 each shall not exceed 5 ppmv, dry @ 15% O2. All emissions during short-term excursions shall be included in all calculations of hourly, daily and annual mass emission rates as required by this permit.

Verification: The Petitioner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification **AQ-34**.

AQ-22 Mass Emission Limits: The owner/operator shall operate the LECEF so that the mass emissions from the S-1, S-2, S-3 & S-4 Gas Turbines and S-7, S-8, S-9, & S-10 HRSGs do not exceed the daily and annual mass emission limits specified below. The owner/operator shall

implement process computer data logging that includes running emission totals to demonstrate compliance with these limits so that no further calculations are required.

Mass Emission Limits (Including Gas Turbine Start-ups and Shutdowns)

Pollutant	Each Turbine / HRSG Power Train (lb/day)	All 4 Turbine / HRSG Power Trains (lb/day)	All 4 Turbine / HRSG Power Trains (ton/yr)
NOx (as NO_2)	252.4	1,009.6	99
POC	~~80.2~~ 64.1	~~320.8~~ 256.4	~~28.3~~ 22.8
CO	~~417.2~~ 220.3	~~1,668.8~~ 881.1	~~98.5~~ 80
SO_x (as SO_2)	41.6	166.4	8.4
PM_{10}	60	240	43.8
NH_3	198	792	118

The daily mass limits are based upon calendar day per the definitions section of the permit conditions. The annual mass limit is based upon a rolling 8,760-hour period ending on the last hour. Compliance shall be based on calendar average one-hour readings through the use of process monitors (e.g., fuel use meters) CEMS, source test results, and the monitoring, record keeping and reporting conditions of this permit. If any part of the CEM involved in the mass emission calculations is inoperative for more than three consecutive hours of plant operation, the mass data for the period of inoperative shall be calculated using a District-approved alternate calculation method. (Basis: cumulative increase, record keeping.)

Verification: The Petitioner/operator shall verify compliance with this Condition of Certification in each quarterly report required by Condition of Certification AQ-34.

7.0 Potential Effects on the Public Related to the Requested Amendments

Consistent with the requirements of the Commission Siting Regulations Section 1769 (a)(1)(G), this section addresses the proposed Amendment's effects on the public.

The construction and operation of the underground transmission line from LECEF to the PG&E Los Esteros Substation will not adversely impact the public. These considerations were addressed in the original 2002 Decision approving the proposed underground line. The Commission has concluded that the construction and operation of the underground line does not pose an aviation hazard, a fire hazard, or a shock hazard as it will be designed according to GO-128 requirements. (2002 Decision pp. 90-92.)

The upgrades required by the Interconnection Study are imposed to maintain system reliability, and are therefore provide a public benefit. The reconductoring process, however, may impose limited public inconveniences depending on which towers are needed to reconductor the line, as towers along the reconductored route stand in road medians, parking lots, wooded riparian areas, and fallow fields. Calpine does not yet know the exact towers that will be accessed by PG&E for the reconductoring process. However, whatever effect reconductoring may have, it will be temporary and limited to discrete tower locations along the Trimble-San Jose B line.

Revision of the Air Quality analysis in the 2006 Decision also does not adversely affect the public because the proposed amendments propose lowering the CO emission limits for the Project and will have a beneficial impact on air quality and public health, as explained in Section 4.0.

8.0 List of Property Owners

Consistent with the Commission Siting Regulations Section 1769(a)(1)(H), this section lists the property owners affected by the proposed modifications:

PG&E:

Mr. Tom Marki
Project Manager
4400 Mansfield
Danville, CA 94506
Phone: 925-736-3723
Cell Phone: 415-302-6788
Email: TxM4@pge.com

City of Santa Clara:

City Manager's Office
Jennifer Sparacino, City Manager
City Hall
1500 Warburton Avenue
Santa Clara, CA 95050

Property Owners Listed for the Reconductoring Route:

City Of San Jose
480 Vendome Street
San Jose, CA 95110
[With regard to Parcel Nos. 259 15 082 and 259 15 080]

City Of San Jose
W Empire Street
San Jose, CA 95110
[With regard to Parcel Nos. 259 13 041, 259 13 083, and 259 13 084]

S C V W D
5750 Almaden Expressway
San Jose, CA 95118
[With regard to Parcel Nos. 259 14 019, 259 14 009, 259 15 018, 259 15 041, and 259 22 061]

City Of San Jose
200 E Santa Clara Street #5th
San Jose, CA 95113
[With regard to Parcel No. 259 15 055]

City Of San Jose
Anita Street
San Jose, CA 95110
[With regard to Parcel No. 259 15 074]

City of San Jose
No site address
[With regard to Parcel No. 259 15 072]

Pacific Gas & Electric Co
260 Coleman Ave
San Jose, CA 95110
[With regard to Parcel No. 259 22 060]

Union Pacific Railroad Co.
1400 Douglas Street
Omaha, NE 68179
[With regard to Parcel No. 259 54 024]

Cousins San Jose Marketcenter LLC
191 Peachtree Street NE #3600
Atlanta, GA 30303
[With regard to Parcel Nos. 259 54 047 and 259 54 048]

9.0 Potential Effects on Property Owners

Consistent with the Commission Siting Regulations Section 1769(a)(1)(I), this section addresses potential effects of the proposed Amendment on nearby property owners, the public, and parties in the application proceeding.

Construction of the underground line will affect already developed property owned by Petitioner and PG&E. Transmission system upgrades required by the Interconnection Study will also only affect property and right-of-way owned by PG&E.

Changes to the Conditions of Certification for Air Quality will not have an adverse effect on property owners, the public or parties to the application proceeding.

LOS ESTEROS CRITICAL ENERGY FACILITY
ATTACHMENTS FOR AMENDMENT #4
For 01-AFC-12C

Prepared for
LOS ESTEROS CRITICAL ENERGY FACILITY, LLC

October 2009

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ATTACHMENT A

PRELIMINARY BIOLOGICAL SITE ASSESSMENT FOR LOS ESTEROS CRITICAL ENERGY FACILITY RECONDUCTORING OF THE TRIMBLE-SAN JOSE B 115KV TRANSMISSION LINE

Biological Site Assessment for Los Esteros Critical Energy Facility Reconductoring of the Trimble-San Jose B 115kV Transmission Line

PREPARED FOR: Mitch Weinberg/Calpine Corporation
Jeanne McKinney/Calpine Corporation
PREPARED BY: Danielle Tannourji/CH2M HILL
COPIES: Sarah Madams/CH2M HILL
Chase Kappel/Ellison, Schneider & Harris, LLP
Gregg Wheatland/ Ellison, Schneider & Harris, LLP
DATE: October 23, 2009

Introduction

This memorandum describes potential biological impacts associated with ground-disturbing activities related to the potential reconductoring of the Trimble- San Jose B 115kV transmission in support of the Los Esteros Critical Energy Facility Amendment #4. This information is based on a preliminary site assessment conducted on October 5, 2009, aerial photograph review, a query of the California Natural Diversity Data Base (CNDDB), review of the United States Fish & Wildlife Service (USFWS) Species List for Santa Clara County, and review of historical documents related to the reconductoring project. The purpose of the site assessment was to assist in identifying potential environmental impacts, necessary mitigation, and anticipated permitting and environmental clearance issues.

The proposed reconductoring project is located in the northeastern portion of San Jose, Santa Clara County, California, near the San Jose International Airport. The proposed reconductoring project area spans across vacant lands, State Highway 101, and the Guadalupe River at approximately 37° 22′ 30.19″ N, 121°55′ 47.12″ W. The reconductoring project is within Township 6 South, Range 1 West, Sections 25, 26, 35, and 36, or the Mount Diablo meridian, Santa Clara County, California, as shown on Figure 1 (all figures are located at the end of this document).

Project Description

The San Jose B – Trimble 115kV transmission line carries two 115 kV electrical circuits between the Trimble Substation, located in San Jose, Santa Clara County, and the San Jose B Substation take-off structure in San Jose, Santa Clara County, California. For the reconductoring project, approximately 1.01[1] miles of the 115 kV transmission line from the

[1] The project area surveyed was larger than the proposed 1.01 mile segment and the 0.07 mile segment..

Trimble Substation to Pole 12/81 (Line A), and 0.07 mile of the 115 kV transmission line of Pole 3/23 to the San Jose B Substation takeoff structure (Line B) will need to be reconductored.

Line A begins at the Trimble substation take-off structure and runs southwest in the center meridian of Component Drive. The line continues southwest through the intersection of Orchard Parkway and Component Drive through undeveloped fields for 0.45 mile until it reaches a pole adjacent to the Guadalupe River. At this point, the line turns south/southeast for approximately 0.31 mile, crossing Highway 101, just west of the intersection of Highway 101 and Highway 87/Guadalupe Parkway. The line continues in a generally southeast direction crossing the car rental facility for the San Jose International Airport, and running generally parallel to Guadalupe Parkway for 0.25 mile. The line continues southeast through the car rental facility, running adjacent to the Guadalupe River for 0.18 mile, and eventually crossing the canal to its terminus at pole 12/81, which is located north of Brokaw Road, east of Airport Road, and west of Guadalupe Parkway. Along this portion of the route, the towers are located in medians, parking lots, wooded riparian areas, and fallow fields.

Line B begins at pole 3/23 located north of Coleman Road, and East of Vendome Road, and heads east to the San Jose Substation Takeoff structure located 0.07 mile to the east of Pole 3/23. The towers are located at the interface between Vendome Road and cross over a landscaped area to the San Jose Substation takeoff structure which is located within a paved area.

Survey Methods

The site survey was conducted on October 5, 2009 between the hours of 10:00 am and 3:00 pm by CH2M HILL biologist, Danielle Tannourji. Air temperatures were between 70-75ºF during the survey. Wind speed was negligible throughout the day with clear skies. The site was systematically evaluated on foot, walking the entire width and length of the reconductoring project alignment which encompassed a 25-foot buffer on each side of the transmission line and included mapping vegetation communities, documenting plants and wildlife species, and photographing existing conditions. Photographs taken during the site survey are included in Attachment A. Lists detailing the CNDDB and USFWS Species Lists are included in Attachment B. Plant and wildlife species observed are provided in Attachment C.

Survey Findings - Flora

The proposed reconductoring project area is characterized by urban land uses with patches of sensitive biological habitats. These habitats are confined to the Guadalupe River channel and include coastal and valley freshwater marsh, open water, cottonwood-willow riparian scrub and forest, and annual grassland. The northern portions of the reconductoring project area, north of the watershed are dominated by developed lands and vacant lots that are dominated by ruderal forbs and non-native annuals that may be mowed on an annual basis. A plant list of the species observed during the field visit is included in Attachment C.

Sensitive Habitats

Wetlands – Freshwater Marsh

A wetland assessment was also conducted on October 5, 2009 concurrent with the preliminary biological survey effort. Methods outlined in the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the Arid West Supplement (U.S. Army Corps of Engineers, 2008) followed a three parameter (hydrophytic, vegetation, wetland hydrology, and hydric soils) approach to determine whether areas along the Guadalupe River supported jurisdictional wetlands. Jurisdictional wetlands were observed in small patches dominated by freshwater marsh species such as cattail (*Typha* spp.) and bulrush (*Scirpus* spp.) adjacent to the open water channel of the Guadalupe River. (see photographs in Attachment A). Therefore, if reconductoring activities will be conducted within the wetland areas, a formal wetland delineation will be required so that all impacts may be accurately determined. This report would need to be submitted and verified by the U.S. Army Corps of Engineers (USACE).

If temporary impacts to jurisdictional wetlands and waters cannot be avoided during reconductoring activities including staging and access, then a Nationwide Permit Pre-construction Notification Form will be necessary for Section 404 Certification prior to reconductoring activities. In addition, a Section 401 Water Quality Certification permit issued by the San Francisco Regional Water Quality Control Board will also be necessary prior to reconductoring activities.

Cottonwood-Willow Riparian Scrub and Forest

Another sensitive habitat found in the reconductoring project area is known as cottonwood-willow riparian scrub and forest (CDFG, 2003). This community occurs within the central portion of the reconductoring project site along the banks of the Guadalupe River. The stand is dominated by Fremont's cottonwood (*Populus fremontii*) and various willow (*Salix* spp.) trees. This native community would be jurisdictional by California Department of Fish and Game (CDFG, 1996) under Section 1600-1603 as it is part of the Guadalupe River riparian canopy. Therefore, if work will be occurring within this habitat, a formal delineation of the riparian canopy within the impact area will be required so that all impacts may be accurately determined. This report would need to be submitted and verified by the CDFG.

If temporary impacts from reconductoring activities to riparian vegetation cannot be avoided, then a Streambed Alteration Agreement Application will be necessary for Section 1602 Certification prior to reconductoring activities.

Survey Findings - Wildlife

Wildlife species observed were those found along the Guadalupe River channel and the open vacant lots within the northern portion of the reconductoring project area. The species were identified by direct observation, tracks, burrows, nests, or scat. Species included: raccoon *(Procyon lotor)*, western scrub-jay (*Aphelocoma californica*), white-breasted nuthatch (*Sitta carolinensis),* red-tailed hawk (*Buteo jamaicensis),* and turkey vulture *(Cathartes aura).* A complete list of species observed during the site visit is included in Attachment C.

Special-status Species

Special-status species include those species that are considered to be rare, threatened, or endangered in California and elsewhere in their known range. For the purpose of this evaluation a species was considered to have special status if it met one or more of the following criteria:

- Currently listed as threatened or endangered under the federal ESA (referred to herein as federally listed species);
- Currently listed as rare, threatened, or endangered under the California ESA or the California Native Plant Protection Act (referred herein as state listed species;
- Proposed or candidate for listing as threatened or endangered under either the federal or state ESA;
- Included on the CNPS's list of rare, threatened, or endangered plants of California.

Based on the habitat evaluation conducted on October 5, 2009 and review of the California Native Plant Society Rare Inventory, California Natural Diversity Database, and the U.S. Fish & Wildlife Service Species List for the reconductoring project region, the following special-status species could potentially occur within the reconductoring project area:

- Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)
- Hall's bush mallow (*Malacothamnus hallii*)
- Central California coast steelhead - Evolutionary Significant Unit (*Oncorhynchus mykiss irideus*)
- Central Valley Chinook salmon (*Oncorhynchus tshawytscha*)
- Green sturgeon - southern distinct population segment (*Acipenser medirostris*)
- Longfin smelt (*Spirinchus thaleichthys*)
- California red-legged frog (*Rana aurora draytonii*)
- Western pond turtle (*Actinemys marmorata*)
- Southwestern pond turtle (*Actinemys marmorata pallida*)
- American peregrine falcon (*Falco peregrinus anatum*)
- Bald eagle (*Haliaeetus leucocphalus*)
- California least tern (*Sterna antillarum browni*)
- Pallid bat (*Antroxous pallidus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- Hoary bat (*Lasiurus cinereus*)
- Yuma myotis (*Myotis yumanensis*)

Furthermore, there are 13 additional bird species that have the potential to nest within the reconductoring project area and are listed as state species of special concern, including the western burrowing owl (*Athene cunicularia*). Tables 1 and 2 include all species listed by CDFG and USFWS that may have a potential to occur in the reconductoring project region. Attachment D includes species accounts for each of these species. Below is a summary of each sensitive biological resource, their potential to occur within the reconductoring project region, an impact assessment, and a course towards mitigation that may be required.

Rare Plants

The CNDDB (2009) and California Native Plant Society (CNPS, 2009) list a total of 36 special-status plants as occurring within the Milpitas quadrangle and the eight surrounding quadrangles (Table 1). The names and legal statuses of these species are identified in Table 1. The special-status species listed under the Federal and State Endangered Species Acts, which are known as federally- and state-listed species, are endemic to salt marshes, vernal pools, serpentine soils, and native upland habitats. These native habitats do not occur along the reconductored transmission line and therefore will not have an effect on federally- and state-listed plant species.

During the October 5, 2009 field visit no special-status plants were found, however, riparian and upland habitats suitable for two special-status plants known from the region occurred within the reconductoring project area. These two special-status plant species, which have a high potential to occur within the reconductoring area, include Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*) and Hall's bush mallow (*Malacothamnus hallii*). Both are CNPS List 1B species. Suitable habitat for these two species occurs along both banks of the Guadalupe River and in the disturbed ruderal lands in the northern portion of the reconductoring project site. Therefore, rare plant surveys during the appropriate blooming periods (March-July) are recommended in these areas prior to reconductoring activities.

If temporary impacts to special-status plant species cannot be avoided, then consultation with CDFG will be necessary prior to reconductoring activities. A mitigation plan will be required on site to mitigate for significant impacts to these special-status plants.

Vernal Pool Crustaceans

Vernal pool habitat was not observed within the reconductoring boundaries or adjacent to the reconductoring area, therefore vernal pool crustaceans are not expected to occur in the reconductoring area.

Fishery Resources

Federally listed aquatic fish species including the Central California Coast Steelhead Evolutionary Significant Unit (*Oncorhynchus mykiss irideus*), Central Valley Chinook Salmon Fall-Run (*Oncorhynchus tshawytscha*), Green Sturgeon (*Acipenser medirostris*) southern distinct population segment, and state candidate Longfin smelt (*Spirinchus thaleichthys*) are known to use the Guadalupe River during the fall and spring migration periods (Oct 15th – June 15th) (SCVWD, 2008). Therefore if temporary impacts from reconductoring activities to the open water channel of the Guadalupe River, including disturbance to water quality from erosion or sedimentation, occur during these migration periods within the river channel, then a formal consultation with National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act will be necessary prior to reconductoring activities. This would include a Biological Assessment to be submitted to NMFS. A Biological Opinion (BO) will be published by the NMFS and the Commission would be required to implement all measures stated in the BO. Compensatory mitigation would likely be required to mitigate for potential impacts to these special-status species and their habitat. However, if all activities are above, and/or outside of the open water channel then no consultation or mitigation would be required. Thus it is highly recommended that reconductoring activities within the Guadalupe River watershed occur outside of the wet season (Oct 15th – June 15th) and if possible above and/or outside of the open water channel altogether.

California Red-legged Frog

Marginal habitat for the California red-legged frog (*Rana aurora draytonii*; CRLF) was observed during reconnaissance surveys within the riparian habitat of the Guadalupe River. However, the Guadalupe River is bordered by dense urbanization with no connectivity to undisturbed upland habitats. Based on the analysis of known locality records for CRLF and habitat suitability, it has been determined that this species has essentially disappeared from the urbanized lowland areas of the Santa Clara Valley and therefore is considered extirpated from this region (SCVWD, 2002). Presence of predatory fish, bullfrogs (*Rana catesbeiana*), mitten crabs (*Eriocheir sinensis*), and crayfish (Astacoidea) further reduces the habitat suitability for this species on the reconductoring project site. With degraded water quality, introduced aquatic predators, little instream cover, and the lack of other habitat complexities (i.e. deep pools, large woody debris jams, contiguous upland habitats) adjacent to the lower reaches of the Guadalupe River, the reconductoring project site does not have the suitable habitat requirements for this sensitive species (SCVWD, 2008; USFWS, 2002). Therefore no impacts are expected to occur during reconductoring activities and no mitigation would be required.

Western and Southwestern Pond Turtles

The two special-status reptile species that may occur within the reconductoring project area include western pond turtle (*Actinemys marmorata*) and southwestern pond turtle (*Actinemys marmorata pallida*). A species-specific description for each of these species is provided in Attachment D.

Suitable habitat for the western pond turtle was observed in the reconductoring project area during the field survey within the open water and freshwater marsh of the Guadalupe River. One CNDDB occurrence from 1997 is known of the western pond turtle just downstream of the reconductoring project area. Therefore, there is a potential for the western pond turtle to be present during the reconductoring project implementation.

Suitable habitat was observed for the southwestern pond turtle in the reconductoring project area during the field visit within the open water and freshwater marsh of the Guadalupe River. However, no CNDDB locations are known from the reconductoring project area; thus, there is a low potential for the southwestern pond turtle to occur during reconductoring project implementation (SCVWD, 2008).

As there is low potential that the western pond turtle may occur in the reconductoring project area, a pre-construction survey will be required approximately one week before reconductoring activities begin. Pending the results of the pre-construction survey, avoidance measures will be employed during reconductoring activities to minimize potential impacts as directed by CDFG. A biological monitor will clear the area daily during activities to assure that no turtles are impacted.

Special-Status Birds (Including Migratory Birds)

The reconductoring project area was inspected for special-status birds including raptors, migratory birds, and suitable nesting habitat. During the field visit, several raptors and migratory bird species were observed in the reconductoring project site; however, no active or inactive nests were identified as the survey was conducted outside of the nesting season. The entire reconductoring project area has potential to support nesting birds during the nesting season. Pre-construction nesting surveys for all birds, including raptors and

migratory birds, should be conducted if work will occur during the nesting season (February 15 through August 31). If the preconstruction surveys identify nests for special-status birds (including migratory birds), avoidance and minimization measures, including buffer zone establishment and biological monitoring, should also be applied. All impacts to nesting birds including raptors during the nesting season shall be avoided as per the Migratory Bird Treaty Act and the state Fish and Game Code, Sections 3503, 3503.5, 3513, and 3800.

Western Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a small, brown and white barred owl that stands 8-10 inches tall. Burrowing owls may be present in any open areas with ground squirrel burrows or artificial burrows on flat ground, hillsides, or low embankments. The northern portion of the reconductoring project area is dominated by open vacant land, which is characterized by active squirrel and jackrabbit burrows. In addition, one burrowing owl was observed flying out of a burrow toward the southeastern edge of the reconductoring project region. Furthermore, this region of San Jose is known to support numerous burrowing owl occurrences as reported by CNDDB for the past decade (Attachment B). Therefore, burrowing owls have a high potential to occur during re-conductoring activities in the northern portion of the reconductoring project alignment.

Due to this high potential of occurrence, habitat assessment surveys will be required prior to reconductoring activities to conclude presence or absence of burrows suitable for burrowing owls within the reconductoring project action area. If burrows are present, then a protocol-level survey will be required during the winter season (December 1st - January 31st) and/or breeding season (February 1st- August 31st) prior to reconductoring activities as outlined by CDFG (1995).

Pending these survey findings, potential impacts to occupied burrowing owl habitat may or may not occur during reconductoring activities. Potential impacts may come in the form of the following:

- Disturbance or harassment within 160 feet of occupied burrows
- Destruction of burrows and burrow entrances. Burrows include structures such as culverts, concrete slabs, and debris piles that provide shelter to burrowing owls.
- Degradation of foraging habitat adjacent to occupied burrows.

If the reconductoring project can avoid impacts, the approved avoidance measures for Occupied Burrows are as follows (California Burrowing Owl Consortium, 1993):

- Reconductoring activities and future operations and maintenance activities during the breeding season (February 1-August 31) shall avoid all occupied burrows unless a qualified biologist approved by CDFG verifies through non-invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) the juveniles from the occupied burrows are foraging independently and are capable of independent survival.
- No disturbance should occur within 160 feet of occupied burrows during the non-breeding season (September 1-January 31) or within 250 feet during the breeding season

(February 1- August 31). Avoidance also requires that a minimum of 6.5 acres of foraging habitat be permanently preserved contiguous with occupied burrow sites for each pair of breeding burrowing owls or single unpaired resident birds, as approved by CDFG.

If the reconductoring project cannot avoid impacts, mitigation measures for the loss of occupied burrowing owl habitat will be required and may include the following:

- To offset the loss of foraging and burrow habitat on the reconductoring project site, a minimum of 6.5 acres of foraging habitat (calculated on a 250 feet foraging radius around the burrow) per pair or unpaired resident bird, should be acquired and permanently protected. The protected lands should be adjacent to occupied burrowing owl habitat and at a location acceptable to CDFG. Protection of additional habitat acreage per pair or unpaired resident bird may be applicable in some instances.
- When destruction of occupied burrows is unavoidable, existing unsuitable burrows should be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on the protected lands site. If owls must be moved away from the disturbance area, passive relocation methods (as described below) should be used rather than trapping. At least one or more weeks will be necessary to accomplish this and allow the owls to acclimate to alternate burrows.
- The reconductoring project sponsor should provide funding for long-term management and monitoring of the protected lands. The monitoring plan should include success criteria, remedial measures, and an annual report to CDFG.

Roosting Bats

The reconductoring project area was inspected for roosting bats and suitable roosting habitat. During the field visit, roosting bats were not observed in or adjacent to the reconductoring project area. However, CNDDB reports several special-status bat species that are known from the area and the entire reconductoring project area supports roosting and/or foraging habitats for bat species (SCVWD, 2008). Bat surveys should be conducted prior to reconductoring activities to assess potential reconductoring project impacts to special-status bat species. Avoidance and minimization measures should also be applied pending the pre-construction survey results.

Conclusions

Based on preliminary review of the proposed reconductoring project presented above, CH2M HILL believes that the proposed reconductoring project requires an Initial Study/Mitigated Negative Declaration under CEQA Guidelines §15060 for potentially significant impacts to sensitive biological resources including sensitive natural communities, special-status plants, special-status fish species, special-status nesting birds, migratory birds, and roosting bats. CEQA Guidelines §15070(a) states:

> *A public agency shall prepare or have prepared a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when:*
>
> *The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or*

The initial Study identifies potentially significant effects, but:

Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and

There would be no substantial evidence, in light of the whole record before the agency, that the project as revised may have significant effect on the environment.

With appropriate avoidance and mitigation measures, the proposed reconductoring project should not have any significant effects on the environment including biological resources. The following summarizes potential impacts or issues and recommendations related to biological resources for the proposed reconductoring project. Table 3 summarizes survey requirements, distance from habitat that could result in a potential impact, and other information related to special-status species requirements associated with the proposed reconductoring project.

- A formal wetland delineation defined by USACE (2008) is necessary to assess potential impacts to jurisdictional wetlands and waters within the Guadalupe River channel.
- A formal riparian canopy delineation defined by CDFG Section 1602 is necessary to assess potential impacts to the river canopy within the Guadalupe River channel. This includes tree trimming, tree removal, and erosion/sedimentation issues.
- Suitable habitat for CNPS List 1B species including Congdon's tarplant and Hall's bush mallow is located on site. Therefore, rare plant surveys by a qualified botanist, utilizing appropriate survey methodology, should be conducted between March-July prior to reconductoring activities.
- The Guadalupe River supports federally- and state-listed fish species. Therefore, work over the open water habitat during the migration period (October 15th – June 15th) is not recommended.
- Western pond turtle surveys should be conducted prior to reconductoring activities to assess potential impacts to this special-status species. Avoidance and minimization measures should be applied pending the pre-construction survey results.
- Pre-construction raptor and migratory bird nesting surveys should be conducted prior to reconductoring activities if work will occur during the nesting season (February 15th through August 31st). Avoidance and minimization measures should be applied pending the pre-construction survey results.
- A habitat assessment for burrowing owls will be required prior to reconductoring activities to conclude presence or absence of burrows suitable for burrowing owls within the reconductoring project action area. If burrows are present, then a protocol-level survey will be required during the winter season (December 1st - January 31st) and/or breeding season (February 1st- August 31st) prior to reconductoring activities as outlined by CDFG. Avoidance and minimization measures should be applied pending the pre-construction survey results.

- Bat surveys should be conducted prior to reconductoring activities to assess potential impacts to special-status bat species. Avoidance and minimization measures should be applied pending the pre-construction survey results.
- A biological monitor shall clear areas where reconductoring activities will occur daily to avoid disturbance of special-status species.

The following is a list of permits and approvals that may be required prior to reconductoring activities if work is conducted during migration periods for sensitive fish species (October 15th - June 15th) or within the Guadalupe River channel.

1. National Marine Fisheries Service (NMFS) - Section 7 Permit for potential impacts to the Central California Coast steelhead, Central Valley Chinook salmon, and Green sturgeon during the fall and spring migration periods. This would require a Biological Assessment to be submitted to NMFS and a formal consultation with the resource agency.
2. United States Army Corps of Engineers (USACE) – Section 404 Permit will be required to address impacts to Waters of the U.S (including wetlands).
3. San Francisco Bay Regional Water Quality Control Board (RWQCB) – Section 401 Water Quality Certification will be necessary to address impacts to Waters of the U.S and Waters of the State.
4. California Department of Fish and Game (CDFG) - Section 1600-1603 Streambed Alteration Agreement will be required for impacts to stream banks and any riparian vegetation associated with the Guadalupe River.

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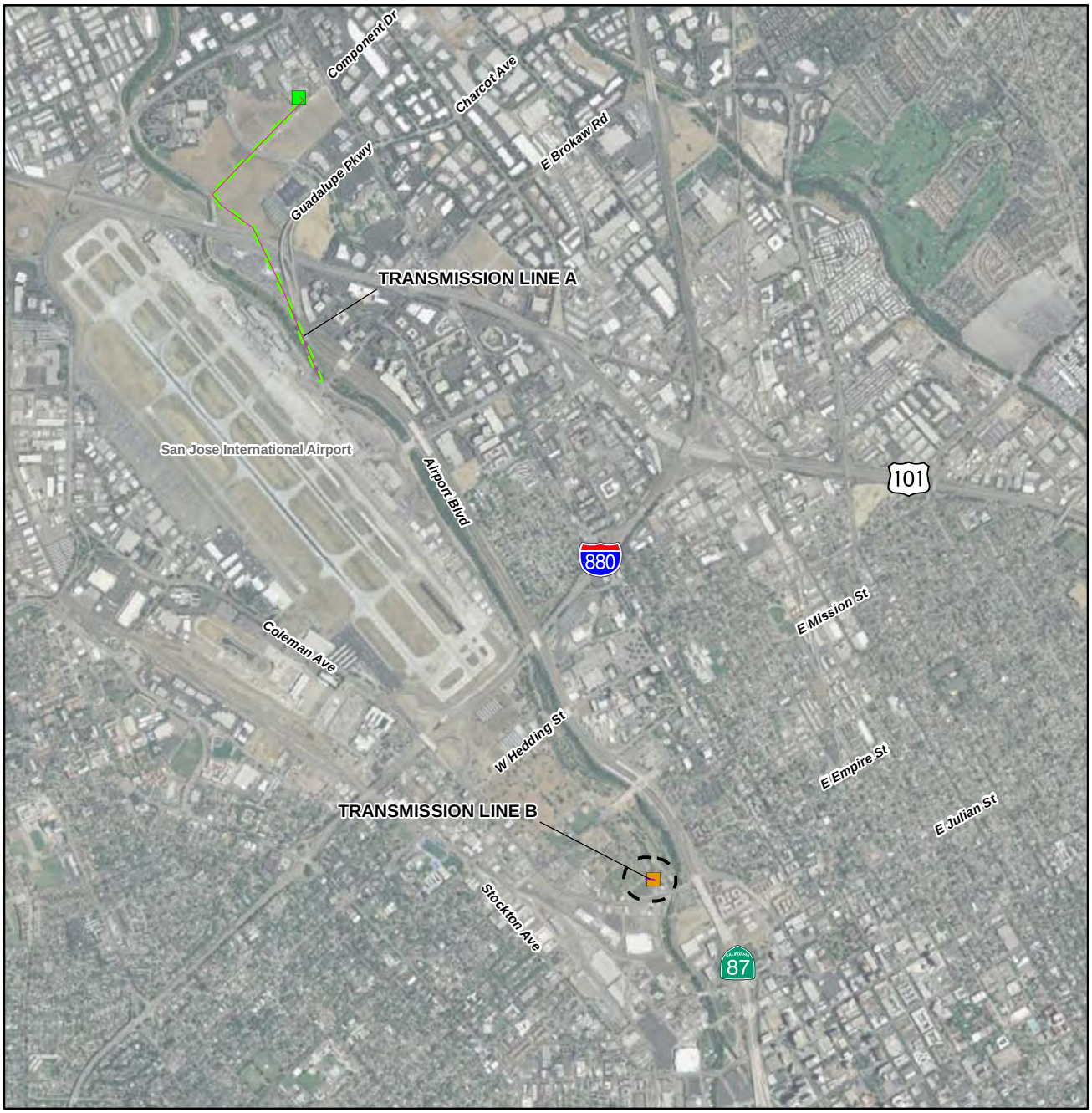
Figure 1
Site Location



LEGEND

- SAN JOSE SUBSTATION
- TRIMBLE SUBSTATION
- TRANSMISSION LINE A
- TRANSMISSION LINE B
- BUFFER - 25 FEET
- BUFFER - 400 FEET

N

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Feet

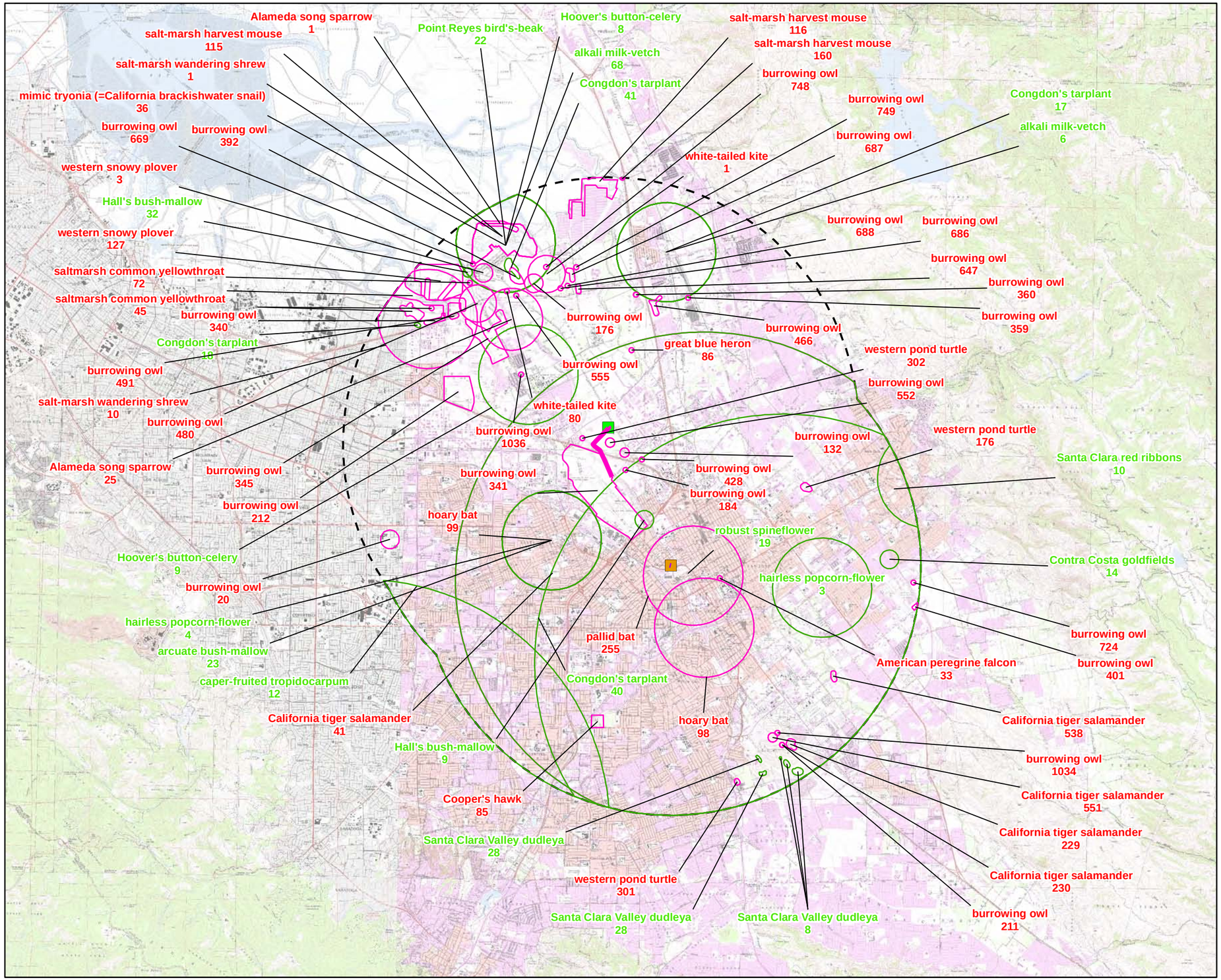
VICINITY MAP

FIGURE 1
BIOLOGICAL SURVEY BUFFERS FOR RECONDUCTORED TRANSMISSION LINE
LOS ESTEROS CRITICAL ENERGY FACILITY AMENDMENT
SAN JOSE, SANTA CLARA COUNTY

CH2MHILL

SAC\\ZION\SACGIS\PROJ\382290LECEF\MAPFILES\BIOLOGYSURVEYMAP.MXD MHASKELL 10/22/2009 16:47:54

Figure 2
California Natural Diversity Database Map



LEGEND

- SAN JOSE SUBSTATION
- TRIMBLE SUBSTATION
- SEGMENT 1
- SEGMENT 2
- Five Mile Buffer

CNDDB - SEPTEMBER 2009

- PLANTS
- ANIMALS

Source: California Department of Fish and Game, Biogeographic Data Branch, California Natural Diversity Database - September 2009

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

N

0 1 2
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FIGURE 2
CA NATURAL DIVERSITY DATABASE
LOS ESTEROS CRITICAL ENERGY FACILITY AMENDMENT
SAN JOSE, SANTA CLARA COUNTY

CH2MHILL

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Tables 1 and 2
Potentially Occurring Special-Status Species

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Arctostaphylos andersonii	Anderson's manzanita	--/--/1B, 2-2-3	Broadleaved upland forest, chaparral, north coast coniferous forest/ 60-730 m/ November-April	Absent	Suitable broad-leaved upland/coniferous forest and chaparral habitats were not observed within the BSA during reconnaissance survey. No CNDDB records are known from the proposed reconductoring project region. In addition, the proposed reconductoring project site is not within the species' elevation range.
Arctostaphylos silvicola	Bonny Doon manzanita	--/--/1B, 2-2-3	Closed-cone coniferous forest, chaparral, inland marine sands/ 120-600 m/ February-March	Absent	Suitable coniferous forest and chaparral habitats were not observed within the BSA during reconnaissance survey. No CNDDB records are known from the proposed reconductoring project region. In addition, the proposed reconductoring project site is not within the species' elevation range.
Astragalus tener var. *tener*	Alkali milk-vetch	--/--/1B, 3-2-3	Alkali playa, valley and foothill grassland, vernal pools in alkaline soils and adobe clay/ 1-170 m/ March-June	Absent	Suitable alkaline playas and vernal pools were not observed within the BSA during reconnaissance surveys. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. Closest known population is known from Milpitas 4.0 km (2.5 mi) east of the reconductoring project site.
Atriplex depressa	Brittlescale	--/--/1B, 2-2-3	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools in alkaline soils. Rarely associated with riparian areas and marshes/ 1-320 m/ May-October	Absent	Suitable chenopod scrub, playas, and meadow habitats were not observed during reconnaissance survey. Grasslands within BSA fringe the wetlands and are dominated non-native, non-halophytic, annual grasses. One CNDDB record is known from Fremont, 6.4 km (4.0 mi) north of the reconductoring project site.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Atriplex joaquiniana	San Joaquin spearscale	--/--/1B, 2-2-3	Chenopod scrub, alkali meadow, valley and foothill grassland in alkaline soils/ 1-250 m/ April-October	Absent	Suitable chenopod scrub and alkali meadow habitats were not observed during reconnaissance survey. Grasslands within BSA fringe the river banks and are dominated by non-native, non-halophytic, annual grasses. One CNDDB record is known from Fremont, 6.4 km (4.0 mi) north of the reconductoring project site.
Balsamorhiza macrolepis var. *macrolepis*	Big-scale balsamroot	--/--/1B, 2-2-3	Valley and foothill grassland, cismontane woodland/ 35-1000 m/ March-June	Absent	Although annual grassland habitats were observed during reconnaissance surveys, the proposed reconductoring project site is not within the species' elevation range. In addition, no CNDDB records are known from the proposed reconductoring project region.
California macrophylla	Round-leaved filaree	--/--/1B, ?-?-?	Cismontane woodland, valley and foothill grassland/ 15-1200 m/ March-May	Absent	Suitable cismontane woodland habitats were not observed during reconnaissance survey. Grasslands within BSA fringe the river banks and are dominated by non-native, annual grasses. In addition, no CNDDB records are known from the proposed reconductoring project region.
Campanula exigua	Chaparral harebell	--/--/1B, 2-2-3	Chaparral/ 300-1250 m/ May-June	Absent	Chaparral was not observed within the BSA during the reconnaissance survey. In addition, the proposed reconductoring project site is not within the species' elevation range. No CNDDB records are known from the proposed reconductoring project region.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	--/--/1B, 2-2-3	Valley and foothill grassland in saline or sandy soils/ 1-230 m/ May-October	Present	Individuals not observed; however, potentially marginal habitat exists along the levee slopes that run parallel to the alignment. Although the grassland habitat onsite is dominated by non-native annual species, sandy soils are present. This species is known from the Alviso area (CNDDB, 2000), occurring with non-native annual and ruderal species in sandy soils much like the habitat seen along the levee slopes.
Chorizanthe pungens var. *hartwegiana*	Ben Lomond spineflower	FE/--/1B, 3-2-3	Lower montane coniferous forest/ 90-610 m/ April-July	Absent	Suitable habitats were not observed during reconnaissance. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Chorizanthe robusta var. *robusta*	Robust spineflower	FE/--/1B, 3-3-3	Cismontane woodland, chaparral, coastal dunes, coastal scrub/ 3-300 m/ April-September	Absent	Suitable habitats were not observed during reconnaissance surveys nor were native coastal dune/scrub plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. One CNDDB record is known from the proposed reconductoring project region 1.6 km (1.0 mi) east of the reconductoring project area at the intersection of SR-82 and Santa Clara.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Cirsium fontinale var. *campylon*	Mt. Hamilton thistle	--/--/1B, 2-2-3	Cismontane woodland, chaparral, valley and foothill grassland in serpentine soils/ 95-890 m/ April-October	Absent	Although annual grassland habitats were observed during reconnaissance surveys, the proposed reconductoring project site is not within the species' elevation range nor does it have serpentine soils present. No CNDDB records are known from the proposed reconductoring project region.
Collinsia multicolor	San Francisco collinsia	--/--/1B, 2-2-3	Closed-cone coniferous forest, coastal scrub/ 30-250 m/ March-May	Absent	Suitable habitats were not observed during reconnaissance surveys nor were native grassland/woodland plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Cordylanthus maritimus ssp. *palustris*	Point Reyes bird's-beak	--/--/1B, 2-2-2	Coastal salt marsh/ 0-15 m/ June-October	Absent	Coastal salt marsh habitats were not observed within the BSA during reconnaissance surveys nor were salt marsh plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. One CNDDB record is known from the Alviso area within salt marsh habitat, 1.6 km (1.0 mi) north of the reconductoring project site.
Dirca occidentalis	Western leatherwood	--/--/1B/2-2-3	Broad-leaf upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, riparian woodland/ 50-395 m/ January-March	Absent	Suitable riparian forest/woodland habitats were observed during reconnaissance surveys; however, the proposed reconductoring project region occurs outside of this species' elevation range. No CNDDB records are known from the proposed reconductoring project region.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Dudleya setchellii	Santa Clara Valley dudleya	FE/--/1B, 3-3-3	Valley and foothill grassland, cismontane woodland in rocky and serpentine soils/ 80-335 m/ April-October	Absent	Although grassland habitats were observed during reconnaissance surveys, the proposed reconductoring project site is not within the species' elevation range nor does it have serpentine soils present. No CNDDB records are known from the proposed reconductoring project region.
Eryngium aristulatum var. *hooveri*	Hoover's button-celery	--/--/1B, 3-3-3	Vernal pools/ 5-45 m/ July	Absent	Vernal pools were not observed during reconnaissance surveys nor were vernal pool plant associates. Habitat within the BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. One CNDDB record is known from the proposed reconductoring project region located in roadside ditch along Lafayette Street, 1.6 km (1.0 mi) west of the reconductoring project site.
Fritillaria liliacea	Fragrant fritillary	--/--/1B, 2-2-3	Coastal scrub, valley and foothill grassland, coastal prairie in serpentine soils/ 3-410 m/ February-April	Absent	Serpentine soils were not observed during reconnaissance surveys nor were native grassland/scrub plant associates tolerant of serpentine soils. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Hoita strobilina	Loma Prieta hoita	--/--/1B, 2-3-3	Chaparral, cismontane woodland, and riparian woodland/ 30-860 m/ May-July	Absent	Suitable riparian habitat was observed during reconnaissance surveys; however, the proposed reconductoring project site is not within the species' elevation range. No CNDDB records are known from the proposed reconductoring project region.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Lasthenia conjugens	Contra Costa goldfields	FE/--/1B, 3-3-3	Valley and foothill grassland, vernal pools, cismontane woodland. Extirpated from most of its range; extremely endangered./ 1-445 m/ March-June	Absent	Suitable habitats were not observed during reconnaissance surveys nor were native grassland/vernal pool plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. Closest known populations occur in Warm Springs and Pacific Commons Preserve in Fremont.
Lessingia hololeuca	Woolly-headed lessingia	--/--/3, 1-?-3	Lower montane coniferous forest, valley and foothill grasslands, serpentinite soils/ 15-305 m/ June-October	Absent	Serpentine soils were not observed during reconnaissance surveys nor were native grassland/scrub plant associates tolerant of serpentine soils. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Lessingia micradenia var. *glabrata*	Smooth lessingia	--/--/1B, 3-2-3	Chaparral, cismontane woodland, serpentinite soils, often roadsides/ 120-420 m/ July-November	Absent	Serpentine soils were not observed during reconnaissance surveys nor were native grassland/scrub plant associates tolerant of serpentine soils. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Malacothamnus arcuatus	Arcuate bush mallow	--/--/1B, 2-2-3	Chaparral, cismontane woodland/ 15-355 m/ April-September	Absent	Chaparral was not observed within the BSA nor does the proposed reconductoring project exceed 20 meters in elevation. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. One CNDDB record is known from the proposed reconductoring project region located 3.2 km (2.0 mi) west of the reconductoring project site.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Malacothamnus hallii	Hall's bush mallow	--/--/1B, 3-2-3	Chaparral and coastal scrub/ 10-760 m/ May-September	Present	Chaparral was not observed within the BSA nor does the proposed reconductoring project exceed 20 meters in elevation. However, two CNDDB records are known from the proposed reconductoring project region.
Micropus amphibolus	Mt. Diablo cottonweed	--/--/3, ?-2-3	Broad-leaved upland forest, chaparral, cismontane woodland, and valley and foothill grassland/ 45-825 m/ March-May	Absent	Suitable habitats were not observed during reconnaissance surveys nor were native grassland plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Monardella villosa ssp. *globosa*	Robust monardella	--/--/1B, 2-2-3	Broad-leaved upland forest, chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland/ 100-915 m/ June-July	Absent	Suitable habitats were not observed during reconnaissance surveys nor were native grassland plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Navarretia prostrata	Prostrate vernal pool navarretia	--/--/1B, 2-3-3	Coastal scrub, valley and foothill grassland, vernal pools, often found in alkaline soils/ 15-700 m/ April-July	Absent	Suitable habitats and soils were not observed during reconnaissance surveys nor were native grassland/vernal pool plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. Closest known population occurs in the Pacific Commons Preserve in Fremont.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Pentachaeta bellidiflora	white-rayed pentachaeta	FE/SE/1B, 3-3-3	Cismontane woodland, valley and foothill grassland, often serpentinite soils/ 35-620 m/ March-May	Absent	Suitable habitats were not observed during reconnaissance surveys nor were native grassland/serpentine plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Piperia candida	White-flowered rein orchid	--/--/1B, 1-1-1	Broad-leaved upland forest, lower montane forest, north coast coniferous forest, sometimes on serpentinite/ 30-1310 m/ May-September	Absent	Suitable habitats were not observed during reconnaissance surveys nor were serpentine plant associates. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Plagiobothrys glaber	Hairless popcorn-flower	--/--/1A	Alkaline meadows and seeps, coastal salt marshes and swamps/ 5-180 m/ March-May	Absent	Coastal salt marsh habitats were not observed within the BSA during reconnaissance surveys nor were salt marsh plant associates. Habitat within BSA is dominated by freshwater marsh and non-native annual grassland. No recent CNDDB records are known from the proposed reconductoring project region. Species thought to be extirpated from the South Bay. Only known from San Benito County.
Potamogeton filiformis	Slender-leaved pondweed	--/--/2, 3-2-1	Marshes and swamps/ 300-2150 m/ May-July	Absent	Suitable freshwater marsh was observed during reconnaissance surveys; however, the proposed reconductoring project site is not within the species' elevation range. No CNDDB records are known from the proposed reconductoring project region.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Senecio aphanactis	Chaparral ragwort	--/--/2, 3-2-1	Chaparral, cismontane woodland, coastal scrub/ 15-1800 m/ January-April	Absent	Suitable habitats were not observed within the BSA during reconnaissance surveys. Habitat within BSA is dominated by freshwater marsh and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Streptanthus albidus ssp. *albidus*	Metcalf Canyon jewel-flower	FE/--/1B, 3-3-3	Valley and foothill grassland/ 45-245 m/ April-July	Absent	Although annual grassland habitats were observed during reconnaissance surveys, the proposed reconductoring project site is not within the species' elevation range nor does it have serpentine soils present. No CNDDB records are known from the proposed reconductoring project region.
Streptanthus albidus ssp. *peramoenus*	Most beautiful jewel-flower	--/--/1B, 2-2-3	Chaparral, valley and foothill grassland, cismontane woodland on serpentine soils/ 120-730 m/ April-September	Absent	Although annual grassland habitats were observed during reconnaissance surveys, the proposed reconductoring project site is not within the species' elevation range nor does it have serpentine soils present. No CNDDB records are known from the proposed reconductoring project region.
Suaeda californica	California seablite	FE/--/1B, 3-3-3	Margins of coastal salt marsh/ 0-5 m/ July-October	Absent	Coastal salt marsh habitats were not observed within the BSA during reconnaissance surveys nor were salt marsh plant associates. Habitat within BSA is dominated by freshwater marsh and non-native annual grassland. One CNDDB record is known from the proposed reconductoring project region, 6.4 km (4.0 mi) north of the reconductoring project area in Fremont.

TABLE 1
Special-status Plant Species

Scientific Name	Common Name	Status Federal/State/CNPS, R-E-D Code	General Habitat Description/Elevation/ Blooming Period	Habitat Present/Absent	Rationale
Tropidocarpum capparideum	Caper-fruited tropidocarpum	--/--/1B, 3-3-3	Valley and foothill grassland in alkaline clay soils/ 0-455 m/ March-April	Absent	Suitable habitats were not observed during reconnaissance surveys nor were native grassland plant associates. Grasslands within BSA fringe the wetlands and are dominated non-native, non-halophytic, annual grasses. No CNDDB records are known from the proposed reconductoring project region.

BSA – Biological Study Area
FE = Federally Endangered.
CNPS = Listed by the California Native Plant Society.
1A = Plants presumed extinct in California.
1B = Plants rare, threatened, or endangered in California and elsewhere.
2 = Plants rare, threatened, or endangered in California, but more common elsewhere.
3 = Plants about which we need more information - a review list;
#-#-# – CNPS Red Codes for rarity, endangerment, and distribution.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Invertebrates					
Adela oplerella	Opler's longhorn moth	--/--/SC	From Marin County and the Oakland area on the inner coast ranges south to Santa Clara County. One record from Santa Cruz County. in serpentine soils with cream cups (*Platystemon californicus*) present.	Absent	Suitable habitats with serpentine soils and *Platystemon californicus* were not observed during reconnaissance surveys. Habitat within BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland on non-serpentine soils. No CNDDB records are known from the proposed reconductoring project region.
Branchinecta conservation	Conservancy fairy shrimp	FE/--/--	Rather large, cool-water vernal pools with moderately turbid water	Absent	Vernal pools were not observed during reconnaissance surveys nor were vernal pool plant associates. Habitat within the BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Danaus plexippus	Monarch butterfly	--/--/SC	Winter roost sites located in wind-protected tree groves with nectar and water sources near by from northern Mendocino to Baja California, Mexico, along the coast	Absent (winter roost)	Suitable winter roosting habitats with dense tree groves were not observed during field reconnaissance surveys. Habitat within BSA is dominated by isolated patches of riparian forest not dense enough for roosting sites. No CNDDB records are known from the proposed reconductoring project region.
Euphydryas editha bayensis	Bay checkerspot butterfly	FT/--/--	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay	Absent	Suitable grassland habitats with serpentine soils were not observed during reconnaissance surveys. Habitat within BSA is dominated by freshwater marsh, riparian forest, and non-native annual grassland on non-serpentine soils. No CNDDB records are known from the proposed reconductoring project region.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Lepidurus packardi	Vernal pool tadpole shrimp and Critical Habitat	FE/--/--	Inhabits vernal pools and swales in the Sacramento valley containing clear to highly turbid water	Absent	Vernal pools were not observed during reconnaissance surveys nor were vernal pool plant associates. Habitat within the BSA is dominated by freshwater marsh and non-native annual grassland. One CNDDB record is known from the Alviso area, 6.4 km (4.0 mi) north of the reconductoring project site.
Linderiella occidentalis	California linderiella	--/--/SC	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions	Absent	Seasonal pools with old alluvial soils were not observed during reconnaissance surveys nor were ephemeral plant associates. Habitat within the BSA is dominated by riparian forest, freshwater marsh, and non-native annual grassland. No CNDDB records are known from the proposed reconductoring project region.
Microcina homi	Hom's micro-blind harvestman	--/--/SC	Known only from Santa Clara County in xeric habitats	Absent	Suitable xeric habitat not observed during reconnaissance surveys. In addition, no CNDDB records were mapped near the proposed reconductoring project region.
Tryonia imitator	California brackish water snail	--/--/SC	Coastal lagoons, estuaries, and salt marshes from Sonoma County south to San Diego County	Absent	Suitable habitat was not observed during the reconnaissance survey within the BSA. Known occurrences are from the salt marsh habitat in Alviso Slough, 1.6 - 6.4 km (1.0 - 4.0 mi) north of the reconductoring project site (CNDDB, 1986).

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Fish					
Acipenser medirostris	Green sturgeon – southern distinct population segment	FT/--/--	Saltwater and freshwater habitats including coastal lagoons, estuaries, and salt marshes within Sacramento River and its tributaries to the San Francisco Bay	Present	Suitable habitat may occur onsite, but no CNDDB records are known from the South Bay. May migrate through the Guadalupe River during fall migration, but records indicate that this species can be considered a rare visitor (SCVWD, 2008).
Hypomesus transpacificus	Delta smelt	FT/ST/--	Found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano, and Yolo counties	Absent	Suitable habitat may occur within the BSA, but proposed reconductoring project region is out of the species' known distribution; therefore, delta smelt does not occur within or adjacent to the proposed reconductoring project site.
Oncorhynchus mykiss	Steelhead- California Central Valley DPS	FT/--/--	From Sacramento and San Joaquin Rivers and their tributaries, but not including, San Francisco and San Pablo Bay basins and tributaries.	Absent	Suitable habitat may occur within the BSA, but proposed reconductoring project region is out of the species' known distribution; therefore, this species does not occur within or adjacent to the proposed reconductoring project site.
Oncorhynchus mykiss irideus	Steelhead-central California coastal ESU and Critical Habitat	FT/--/--	From Russian river south to Soquel Creek and to, but not including, Pajaro River; also San Francisco and San Pablo Bay basins	Migratory Habitat/Not Spawning or Rearing Habitat	May migrate through the lower reaches of Guadalupe River en route to suitable spawning and rearing habitat along the upper reaches of the Guadalupe River.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Oncorhynchus tshawytscha	Central Valley Chinook salmon – fall-run (Note: The federally-threatened Central Valley spring-run chinook salmon ESU is not found in the South Bay tributaries but is limited to the Sacramento River and its tributaries).	FC/--/--	Found from the Bering Strait area off Alaska south to Southern California	Migratory Habitat/Not Spawning or Rearing Habitat	May migrate through the lower reaches of Guadalupe River en route in the fall to suitable spawning and rearing habitat along the upper reaches of the Guadalupe River. Genetic testing on Guadalupe river fall-run Chinook salmon has demonstrated that these fish do not belong to naturally spawning populations but derive from hatchery stock. It is not known if they have naturalized; therefore, their special-status designation does not apply (D. Hedgecock, personal communication, March 17, 2009).
Oncorhynchus tshawytscha	Central Valley Chinook salmon – winter-run	FE/--/--	Found from the Bering Strait area off Alaska south to Southern California	Absent	Not known to migrate through the south bay tributaries to the San Francisco Bay, therefore this species does not occur in the BSA.
Oncorhynchus tshawytscha	Central Valley Chinook salmon – spring-run	FT/--/--	Found from the Bering Strait area off Alaska south to Southern California	Absent	Not known to migrate through the south bay tributaries to the San Francisco Bay, therefore this species does not occur in the BSA.
Spirinchus thaleichthys	Longfin smelt	--/CC/--	Found from Monterey to Alaska in saltwater and freshwater habitats, including coastal lagoons, estuaries, and marshes	Present	Suitable habitat occurs onsite, and this species is known to occur in Alviso Slough (SCVWD, 2008) just downstream of the BSA.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Amphibians					
Ambystoma californiense	California tiger salamander	FT/--/--	Species now listed as threatened statewide. Populations in Santa Barbara and Sonoma Counties formerly listed as endangered. Need underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	Absent	Seasonal pools were not observed during reconnaissance surveys nor were suitable upland aestivation habitats. This species is not known from the lower reaches of the Guadalupe River or within an 8.0 km (5.0 mi) radius of the proposed reconductoring project. In addition, no CNDDB records are known from the proposed reconductoring project region.
Rana aurora draytonii	California red-legged frog	FT/--/SC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation	Absent	Marginal habitat was observed during reconnaissance surveys. However, this species is not currently known from the Santa Clara Valley, the lower reaches of the Guadalupe River, or within an 8.0 km (5.0 mi) radius of the proposed reconductoring project (SCVWD, 2002). In addition, no CNDDB records are known from the proposed reconductoring project region.
Rana boylii	Foothill yellow-legged frog	--/--/SC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats.	Absent	Suitable habitat was not observed during reconnaissance surveys. This species is not known from the lower reaches of the Guadalupe River or within an 8.0 km (5.0 mi) radius of the proposed reconductoring project. In addition, no CNDDB records are known from the proposed reconductoring project region.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Reptiles					
Emys marmorata	Western pond turtle	--/--/SC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation	Present	Suitable habitat was observed throughout the BSA during reconnaissance surveys within the open water channel, freshwater marsh, and riparian forest of Guadalupe River. One CNDDB occurrence is known from the reconductoring project site. (CNDDB, 1997).
Emys marmorata pallida	Southwestern pond turtle	--/--/SC	Inhabits permanent or nearly permanent bodies of water in many habitat types below 6,000-foot elevation	Present	Suitable habitat was observed throughout the BSA during reconnaissance surveys within the open water channel, freshwater marsh, and riparian forest of Guadalupe River. However, no CNDDB records are known from the proposed reconductoring project region.
Masticophis lateralis euryxanthus	Alameda whipsnake	FT/ST/--	Restricted to coastal scrub, chaparral, and valley-foothill hardwood habitat of the coast ranges between Monterey and north San Francisco Bay	Absent	Suitable habitats were not observed during reconnaissance surveys. Habitat within BSA is dominated by patches of riparian forest, freshwater marsh, and non-native annual grassland in an urban setting. In addition, no CNDDB records are known from the proposed reconductoring project region.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status Federal/State/ CDFG	General Habitat Description	Habitat Present/Absent	Rationale
Birds					
Accipiter cooperii	Cooper's hawk	--/--/SC (nesting)	Nests in woodland, chiefly of open, interrupted or marginal type	Present	Suitable valley-foothill deciduous riparian habitats for nesting were observed during reconnaissance surveys. Suitable foraging habitat dominated by non-native annual grassland also occurs within BSA. One CNDDB record is known from the proposed reconductoring project region, 7.2 km (4.5 mi) southwest of the Guadalupe River in San José. May occur as a migrant or winter resident from August to March.
Accipiter striatus	Sharp-shinned hawk	--/--/SC (nesting)	Forages/nests in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats; prefers to nest in riparian areas	Present	Suitable valley-foothill deciduous riparian habitats for nesting were observed during reconnaissance surveys. Suitable foraging habitat dominated by non-native annual grassland also occurs within BSA. No CNDDB records are known from the proposed reconductoring project region. May occur as a migrant or winter resident from August to March.
Agelaius tricolor	Tricolored blackbird	--/--/SC (nesting)	(Nesting colony) highly colonial species, most numerous in central valley and vicinity; largely endemic to California	Present	Suitable habitat for nesting was observed during reconnaissance surveys within the freshwater marsh within the BSA. Two CNDDB records are known, 8.0 km (5.0 mi) northeast of the reconductoring project site in Fremont.
Aquila chrysaetos	Golden eagle	--/--/SC	Nesting and wintering in rolling foothills mountain areas, sage-juniper flats, desert, cliff, and electrical towers; forages in open areas	Nesting Absent/Foraging Present	Suitable nesting and wintering habitats were not observed within the BSA during reconnaissance surveys. No CNDDB records are known from the proposed reconductoring project region. Could potentially occur as an occasional forager during the non-breeding season from August to March.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Ardea herodias	Great blue heron	--/--/SC (nesting)	Rookery colonial nester in tall trees, cliffsides, and sequestered spots on marshes	Present	Suitable rookery sites for nesting were observed during reconnaissance surveys; however, no CNDDB rookery records are known from the proposed reconductoring project region. Suitable foraging habitat within BSA is dominated by freshwater marsh.
Asio flammeus	Short-eared owl	--/--/SC (nesting)	Nests on ground in tall emergent marshlands or grasslands; forages over many open habitats	Present	Suitable habitat for nesting and foraging was observed during reconnaissance surveys throughout the BSA; however, no CNDDB records are known from the proposed reconductoring project region.
Athene cunicularia	Burrowing owl	--/--/SC	Burrow sites open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation	Present	Suitable habitat for nesting was observed during reconnaissance surveys within the non-native grassland and ruderal habitats of the BSA. In addition, there are 25 known CNDDB records surrounding the proposed reconductoring project region concentrated near the reconductoring project site.
Bucephala islandica	Barrow's goldeneye	--/--/SC (nesting)	Forages and nests in freshwater marsh habitat and winters in coastal marine habitats	Nesting Absent/Foraging Present	Suitable habitat for nesting and foraging was observed during reconnaissance surveys throughout the BSA; however, this species is a winter migrant not known to nest within the proposed reconductoring project region, No CNDDB records are known from the proposed reconductoring project region. Individuals are most commonly observed in the South Bay region during the non-breeding season between December and February.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Chaetura vauxi	Vaux's swift	--/--/SC (nesting)	Forages aerially near nesting habitats; nests in snags of coastal coniferous forests	Nesting Absent/Foraging Present	Suitable foraging areas exists onsite. Individuals could forage in BSA during migration; However, no nesting habitat was observed within the BSA during the reconnaissance surveys. In addition, no CNDDB records are known from the proposed reconductoring project region.
Charadrius alexandrinus nivosus	Western snowy plover	FT/--/SC	Nesting occurs along sandy beaches, salt pond levees, and shores of large alkali lakes on gravelly or friable soils. Federal listing applies only to the pacific coastal population.	Nesting Absent/Foraging Present	No suitable habitat for nesting was observed within or adjacent to the BSA. Two CNDDB records are known, 1.6 km (5.0 mi) from the reconductoring project site both occurring on salt flats. This type of habitat was not observed within the BSA.
Circus cyaneus	Northern harrier	--/--/SC (nesting)	Nest and forages in marshes, grasslands, and disturbed upland habitats	Present	Suitable habitat for nesting and foraging was observed throughout the BSA during reconnaissance surveys. One CNDDB occurrence was reported, 8.0 km (5.0 mi) northwest of the proposed reconductoring project region in Fremont.
Dendroica petechia	California yellow warbler	--/--/SC (nesting)	Forages and nests in riparian areas dominated by willows and cottonwoods	Present	Suitable nesting and foraging areas were observed onsite during the reconnaissance surveys; however, no CNDDB locations are known from the proposed reconductoring project region. Individuals could forage in BSA during migration.
Elanus leucurus	White-tailed kite	--/--/SP (nesting)	Nests in rolling foothills/valley margins w/scattered oaks and river bottomlands or marshes next to deciduous woodlands	Present	Suitable riparian woodland habitats for nesting near the marshes of the BSA were observed during reconnaissance surveys. In addition, suitable habitat for foraging was observed within the annual grassland habitats throughout the BSA. Two CNDDB records are known from 1.6 km (1.0 mi) east of the reconductoring project site.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Eremophila alpestris actia	California horned lark	--/--/SC	Forages and nests in annual grasslands, coastal plains, and open fields	Nesting Absent/Foraging Present	Suitable habitat for nesting and foraging was observed during reconnaissance surveys within the annual grassland habitats; however, this species is not considered a local breeder to the region as it has been documented only during the non-breeding season. Thus, this species is not considered to be a local breeder of the South Bay region. No CNDDB records are known from the proposed reconductoring project region.
Falco columbarius	Merlin	--/--/SC	Uses many habitats in California during migration and wintering	Nesting Absent/Foraging Present	Suitable habitat for nesting was observed during reconnaissance surveys within the riparian forest, freshwater marsh, and upland habitats within the BSA; however, this species does not nest in California. Known as an occasional forager to the Bay Area. No CNDDB records are known from the proposed reconductoring project region.
Falco peregrinus anatum	American peregrine falcon	--/SE/SP	Forages near wetlands, lakes, rivers, or other water; nests on cliffs, banks, dunes, mounds and also near human-made structures	Present	Suitable foraging areas were observed within the riparian forest and freshwater marsh habitats during the reconnaissance surveys. Nesting habitat was observed adjacent to the BSA. One CNDDB occurrence is known from 8.0 km (5.0 mi) south of the reconductoring project site in San José.
Geothlypis trichas sinuosa	Salt marsh common yellowthroat	--/--/SC	Resident of the San Francisco Bay region in fresh and saltwater marshes	Present	Suitable habitat for nesting and foraging was observed during reconnaissance surveys within the freshwater habitat of the BSA. In addition, there are two known CNDDB locations in Alviso north of the reconductoring project site.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Haliaeetus leucocphalus	Bald eagle	FPD/SE/SP	Forages along sea coasts, rivers, and lakes for fish; nests in tall trees or cliffs	Present	Suitable foraging areas were observed within the freshwater marsh habitats during the reconnaissance surveys. Marginal nesting habitat was observed In the riparian areas; however, no CNDDB records are known from the proposed reconductoring project region.
Lanius ludovicianus	Loggerhead shrike	--/--/SC (nesting)	Forages in grasslands, marshes, and disturbed habitats; nests in dense upland habitats	Present	Suitable nesting and foraging areas were observed within the riparian areas, freshwater marshes, and disturbed upland habitat within the BSA during the reconnaissance surveys; however, no CNDDB records are known from the proposed reconductoring project region, but CH2M HILL biologists have trapped this species adjacent to the reconductoring project site.
Laterallus jamaicensis coturniculus	California black rail	--/ST/SP	Mainly inhabits freshwater, brackish, and salt marshes bordering larger bays	Nesting Absent/Foraging Present	Suitable habitat for nesting was observed during reconnaissance surveys within the freshwater habitat of the BSA; however, species is not currently known to breed in the South Bay region (SCVWD, 2008). No CNDDB records are known from the proposed reconductoring project region.
Melospiza melodia pusillula	Alameda song sparrow	--/--/SC	Resident of salt marshes bordering south arm of San Francisco Bay	Absent	Suitable habitat consisting of gum plant and cordgrass within salt marsh was not observed during reconnaissance surveys. One known CNDDB location within salt marsh habitat north of Alviso, 5.6 km (3.5 mi) northwest of the reconductoring project region

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Numenius americanus	Long-billed curlew	--/--/SC (nesting)	Forages in marshes, mudflats, pastures, and agricultural fields; nests in prairies and short grass fields	Nesting Absent/Foraging Present	Suitable foraging areas are present within BSA; however, no CNDDB records are known from the proposed reconductoring project region.
Pandion haliaetus	Osprey	--/--/SC (nesting)	Forages in freshwater habitats including lakes, rivers, and marshes along the coastal/ tidal regions; nests in tall trees or cliffs near foraging habitat	Nesting Absent/Foraging Present	Suitable foraging areas were observed within the freshwater marsh habitats in the reconductoring project area during the reconnaissance surveys; however, no nesting habitat was observed. In addition, no CNDDB records are known from the proposed reconductoring project region.
Pelecanus erythrorhnchos	American white pelican	--/--/SC (nesting)	Occurs in freshwater habitats including lakes, ponds, and rivers; nests in on islands within lakes	Nesting Absent/Foraging Present	Suitable foraging areas were observed within the freshwater marsh habitats during the reconnaissance surveys; however, no nesting habitat was observed. No CNDDB records are known from the proposed reconductoring project region. May occur onsite as a visitor between August and February.
Pelecanus occidentalis californicus	California brown pelican	FE/SE/SP	Occurs in marine habitats including coastal bays, estuaries, and marshes; nests in southern California	Absent	Unsuitable foraging areas were observed within the freshwater marsh and disturbed habitats during the reconnaissance surveys; no nesting habitat was observed. No CNDDB records are known from the proposed reconductoring project region. May occur onsite as a visitor between July and December.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Phalacrocorax auritus	Double-crested cormorant	--/--/SC (nesting)	Nests in colonies on coastal cliffs, islands, electrical transmission towers, and lake margins; forages in open water habitats	Nesting Absent/Foraging Present	Suitable foraging areas were observed within the freshwater marsh and disturbed habitats during the reconnaissance surveys. No nesting habitat was observed. No CNDDB records are known from the proposed reconductoring project region. May occur onsite as it is a year-round resident of the South Bay region.
Plegadis chihi	White-faced ibis	--/--/SC (nesting)	Forages in freshwater and brackish marsh habitats; nests in colonies within extensive, fresh emergent wetland habitats	Present	Suitable foraging and nesting areas occur onsite; however, no CNDDB locations are known from the proposed reconductoring project region. Individuals are most commonly observed in the South Bay region during the non-breeding season in September and October.
Rallus longirostris obsoletus	California clapper rail	FE/SE/SP	Saltwater and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay dominated by pickleweed and cordgrass	Nesting Absent/Foraging Present	Habitat dominated by pickleweed and cordgrass suitable for nesting was not observed during reconnaissance surveys within the marsh habitat of the BSA. In addition, the two known CNDDB occurrences, reported 5.6 km (3.5 mi) to the north and northwest of the BSA, were sited in late 1970s, with no current nesting records reported since. Thus, this species is not expected to nest within the BSA. Marginal mudflat foraging habitat occurs within the BSA.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Riparia riparia	Bank swallow	--/ST/--	Nests in riparian and other lowland habitats west of the desert along vertical banks/ cliffs with fine textured/sandy soils near streams, rivers, lakes, and oceans	Nesting Absent/Foraging Present	Suitable foraging and nesting habitat areas were observed within the freshwater marsh and disturbed habitats during the reconnaissance surveys; however, species is not known to breed in the Bay Area. No known CNDDB records near the proposed reconductoring project region. May occur as a rare forager during the spring and fall migration.
Rynchops niger	Black skimmer	--/--/SC (nesting)	Nests in marshes, salt ponds typically on the sandbars or levees	Present	Suitable habitat for nesting and foraging was observed during reconnaissance surveys within the freshwater habitat of the BSA. No known CNDDB records near the proposed reconductoring project region.
Sternula antillarum browni	California least tern	FE/SE/SP	Nests along the coast from San Francisco Bay south to northern Baja California, Mexico on bare sparsely vegetated, flat substrates such as sand beaches, alkali flats, land fills, or paved areas	Present	Suitable habitat for nesting was observed during reconnaissance surveys along the flats of the levees and potentially in areas near the open water channel within and adjacent to the proposed reconductoring project site; however, there are no known nesting records in the region. The four CNDDB locations, 7.2 km (4.5 mi) west of the reconductoring project area, are known as post-breeding staging areas. Therefore, the species may occur as a forager but is not likely to nest within the BSA.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status Federal/State/ CDFG	General Habitat Description	Habitat Present/Absent	Rationale
Mammals					
Antrozous pallidus	Pallid bat	--/--/SC	Deserts, grasslands, shrublands, woodlands, and forests; most common in open, dry habitats with rocky areas for roosting; in California, common in oak woodlands and grasslands	Present	Suitable habitat associated with oak woodlands and rocky outcrops not observed during reconnaissance surveys; however, a CNDDB location was mapped at 1.6 km (1.0 mi) south of the reconductoring project area.
Corynorhinus townsendii	Townsend's big-eared bat	--/--/SC	Throughout California in a wide variety of habitats; most common in mesic sites and use caves, trees, and manmade structures such as abandoned buildings to roost	Present	Suitable foraging and roosting habitat observed during reconnaissance surveys within the riparian forest, freshwater marsh, and non-native grassland habitats; however, no CNDDB roosting records were mapped near the proposed reconductoring project region. Because no known roosts occur within the region and this species is known for not foraging more than 50 km (31 mi) from their roosts, species has a low potential to occur within the BSA.
Dipodomys heermanni berkeleyensis	Berkeley kangaroo rat	--/--/SC	Open grassy hilltops and open spaces in chaparral and blue oak/digger pine woodlands	Absent	Suitable habitat not observed during reconnaissance surveys. In addition, no CNDDB records were mapped near the proposed reconductoring project region.
Lasiurus cinereus	Hoary bat	--/--/SC	Optimal habitats are open forests and riparian woodlands with sources of water over which to feed	Present	Suitable foraging and roosting habitat observed during reconnaissance surveys within the riparian forest, freshwater marsh, and non-native grassland habitats. Two CNDDB records were mapped 1.6 km (1.0 mi) south and west of the reconductoring project area.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Myotis yumanensis	Yuma myotis	--/--/SC	Optimal habitats are open forests and riparian woodlands with sources of water over which to feed	Present	A roosting colony occurs in the abandoned buildings 1.6 km (1.0 mi) north of the reconductoring project area (SCVWD, 2008). Suitable foraging habitat occurs in the open water channel and marshlands within the BSA.
Dipodomys venustus venustus	Santa Cruz kangaroo rat	--/--/SC	Silverleaf manzanita mixed chaparral in the Zayante Sand Hills of Santa Cruz Mountains	Absent	Suitable habitat not observed during reconnaissance surveys. In addition, no CNDDB locations were mapped near the proposed reconductoring project region. Closest CNDDB location found 3.2 km (2 mi) southwest of City of Saratoga.
Reithrodontomys raviventris	Salt-marsh harvest mouse	FE/SE/SP	Nests in the saline emergent wetlands of San Francisco Bay and its tributaries including brackish marshes	Absent	Suitable emergent brackish marsh habitat was not observed during the reconnaissance survey in the northern portion of the proposed reconductoring project site. In addition, the various known CNDDB occurrences within the proposed reconductoring project region all occur within salt marsh habitat. Thus, due to the lack of suitable salt marsh habitat within the BSA, this species would not have the potential to occur within the proposed reconductoring project site.
Sorex vagrans halicoetes	Salt-marsh wandering shrew	--/--/SC	Salt marshes of the south arm of San Francisco Bay	Absent	Suitable salt marsh habitat was not observed during the reconnaissance survey. In addition, CNDDB records indicate that the two occurrences mapped near the proposed reconductoring project region were re-surveyed in the late 1970s with negative results.

TABLE 2
Special-status Wildlife Species

Scientific Name	Common Name	Status **Federal/State/ CDFG**	General Habitat Description	Habitat Present/Absent	Rationale
Vulpes macrotis mutica	San Joaquin kit fox	FE/ST/--	Annual grasslands or grassy open stages with scattered shrubby vegetation	Absent	Suitable habitat was not observed during the reconnaissance survey. In addition, no known CNDDB occurrences are mapped near the proposed reconductoring project region.

BSA – Biological Study Area
SC= species of special concern listed by the California Department of Fish and Game.
FC = Federal candidate for listing.
FE = Federally endangered.
FT = Federally threatened.
FPD = Federal species proposed to be delisted.
SE = State endangered.
ST = State threatened.
SP = State protected.
CC-=State candidate.

Table 3
Survey Requirements

TABLE 3
Survey Requirements and Distance from Habitat Triggering Potential Impact to Special-status Wildlife Species

Species	Status	Potential for Species to be Located near proposed reconductoring project	Distance From Habitat Triggering Potential Impact	Protocol Survey Required (if determined potentially present	Survey Timing	Allowable Construction Window	Published Avoidance and Minimization Measures	Comments
Western Pond Turtle *Emys (=Clemmys) marmorata*	--/CSC	Moderate – suitable habitat is present within the reconductoring project	300 feet from known nest	No protocol	Conducted during site survey	All year	No	Pre-construction surveys required.
Southwestern Pond Turtle *Emys (=Clemmys) marmorata pallida*	--/CSC	Low – no suitable habitat is present within the reconductoring project	300 feet from known nest	No protocol	Conducted during site survey	All year	No	Pre-construction surveys required.
Burrowing Owl *Athene cunicularia*	MBTA/CSC	High- suitable habitat (burrows) is present within the reconductoring project	160 feet during the non-nesting season 250 feet during the nesting season	Yes	Habitat assessment, breeding surveys should be conducted from April 15 – July 15. Winter surveys December 1 – January 31 within same year as proposed reconductoring project construction	All year if outside of breeding/nesting locations see Distance from habitat.	Yes	Pre-construction surveys required.

TABLE 3
Survey Requirements and Distance from Habitat Triggering Potential Impact to Special-status Wildlife Species

Species	Status	Potential for Species to be Located near proposed reconductoring project	Distance From Habitat Triggering Potential Impact	Protocol Survey Required (if determined potentially present	Survey Timing	Allowable Construction Window	Published Avoidance and Minimization Measures	Comments
Pallid Bat *Antrozous pallidus*	--/CSC	Yes	100 feet[1] from active roosts	No Protocol	Prior to construction activities.	All year-if roosts are not impacted	Not by agencies – CalTrans, 2004 – California Bat Mitigation Techniques, Solutions, Effectiveness	Pre-construction surveys required.
Yuma Myotis *Myotis yumanensis*	--/CSC	Yes	100 feet[1] from active roosts	No Protocol	Prior to construction activities.	All year-if roosts are not impacted	Not by agencies – CalTrans, 2004 – California Bat Mitigation Techniques, Solutions, Effectiveness	Pre-construction surveys required.
Hoary bat *Lasiurus cinereus*	--/CSC	Yes	100 feet[1] from active roosts	No Protocol	Prior to construction activities.	All year-if roosts are not impacted	Not by agencies – CalTrans, 2004 – California Bat Mitigation Techniques, Solutions, Effectiveness	Pre-construction surveys required.

TABLE 3
Survey Requirements and Distance from Habitat Triggering Potential Impact to Special-status Wildlife Species

Species	Status	Potential for Species to be Located near proposed reconductoring project	Distance From Habitat Triggering Potential Impact	Protocol Survey Required (if determined potentially present	Survey Timing	Allowable Construction Window	Published Avoidance and Minimization Measures	Comments
Townsend's big-eared bat *Corynorhinus townsendii*	--/CSC	Yes	100 feet[1] from active roosts	No Protocol	Prior to construction activities.	All year-if roosts are not impacted	Not by agencies – CalTrans, 2004 – California Bat Mitigation Techniques, Solutions, Effectiveness	Pre-construction surveys required.

Notes:

1 – Qualified biologist may be able to reduce buffer if activities do not cause stress to species; approval from California Fish and Game and U.S. Fish and Wildlife Service required.
CE = State listed Endangered Species
CT = State listed Threatened Species
CSC = Species of Special Concern
FT = Federally-listed Threatened Species
FE = Federally listed Endangered Species
MBTA = Migratory Bird Treaty Act

Attachment A
Site Photographs

1. View of the northern portion of the reconductoring project, looking west. Area has been recently mowed. Burrowing owl observed here.

2. A vacant burrow found at the base of a concrete post just adjacent to the reconductoring project alignment.

3. View of northern portion of the reconductoring project, looking northeast. California squirrels and black-tailed jackrabbits observed here.

4. View of the northern portion of the reconductoring project area, looking south. State Route 87 and State Highway 101 in the background.

Attachment A
Representative Photographs

CH2MHILL

5. View of the central portion of the reconductoring project, looking north along the Guadalupe River. The lines here are directly above the western banks of the river.

6. View of the central portion of the reconductoring project, looking northeast along the Guadalupe River. The lines here span across the Guadalupe River and its riparian canopy.

7. Another view of the central portion of the reconductoring project, looking north-northeast along the Guadalupe River. The lines here span across the Guadalupe River riparian

8. View of the central portion of the reconductoring project area from the eastern bank of the Guadalupe River, looking north. The lines span across the river channel.

9. View of the central portion of the reconductoring project, looking along the banks of the Guadalupe River. The banks here in this section have patches of wetland vegetation such as cattails.

10. Another view of the central portion of the reconductoring project, looking along the banks of the Guadalupe River dominated by wetland vegetation.

11. Another view of the central portion of the reconductoring project with patches of bulrush wetland vegetation.

12. View of the central portion of the reconductoring project area from the eastern banks, looking up. The lines span across the river channel where patches of wetland vegetation occur.

Attachment B
USFWS and CNDDB Species List

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

October 13, 2009

Document Number: 091013012129

Danielle Tannourji
CH2M HILL

Subject: Species List for Los Esteros

Dear: Interested party

We are sending this official species list in response to your October 13, 2009 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be January 11, 2010.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 091013040303

Database Last Updated: January 29, 2009

Quad Lists

Listed Species

Invertebrates

Euphydryas editha bayensis

bay checkerspot butterfly (T)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central California Coastal steelhead (T) (NMFS)

Central Valley steelhead (T) (NMFS)

Critical habitat, Central California coastal steelhead (X) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)

winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

Birds

Rallus longirostris obsoletus

California clapper rail (E)

Sternula antillarum (=Sterna, =albifrons) browni

California least tern (E)

Quads Containing Listed, Proposed or Candidate Species:

SAN JOSE WEST (427C)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland

habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be January 11, 2010.

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 091013012129

Database Last Updated: January 29, 2009

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio

Conservancy fairy shrimp (E)

Euphydryas editha bayensis

bay checkerspot butterfly (T)

Lepidurus packardi

Critical habitat, vernal pool tadpole shrimp (X)

vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus mykiss

Central California Coastal steelhead (T) (NMFS)

Central Valley steelhead (T) (NMFS)

Critical habitat, Central California coastal steelhead (X) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)

winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)

Reptiles

Masticophis lateralis euryxanthus

Alameda whipsnake [=striped racer] (T)

Birds

Charadrius alexandrinus nivosus

western snowy plover (T)

Rallus longirostris obsoletus

California clapper rail (E)

Sternula antillarum (=Sterna, =albifrons) browni

California least tern (E)

Mammals

Reithrodontomys raviventris

salt marsh harvest mouse (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

Plants

Lasthenia conjugens

Contra Costa goldfields (E)

Critical habitat, Contra Costa goldfields (X)

Suaeda californica

California sea blite (E)

Quads Containing Listed, Proposed or Candidate Species:

MILPITAS (427B)

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> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

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- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these

lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be January 11, 2010.

	Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS/R-E-D
1	Accipiter cooperii Cooper's hawk	ABNKC12040			G5	S3	SC
2	Adela oplerella Opler's longhorn moth	IILEE0G040			G2G3	S2S3	
3	Ambystoma californiense California tiger salamander	AAAAA01180	Threatened		G2G3	S2S3	SC
4	Athene cunicularia burrowing owl	ABNSB10010			G4	S2	SC
5	Balsamorhiza macrolepis var. macrolepis big-scale balsamroot	PDAST11061			G3G4T2	S2.2	1B/2-2-3
6	Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1			G4T3	S3.2	1B/2-2-3
7	Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered		G2T1	S1.1	1B/3-3-3
8	Cirsium fontinale var. campylon Mt. Hamilton thistle	PDAST2E0F0			G2T2	S2.2	1B/2-2-3
9	Collinsia multicolor San Francisco collinsia	PDSCR0H0B0			G2	S2.2	1B/2-2-3
10	Dudleya setchellii Santa Clara Valley dudleya	PDCRA040AC	Endangered		G1	S1.1	1B/3-3-3
11	Emys (=Clemmys) marmorata western pond turtle	ARAAD02030			G3G4	S3	SC
12	Euphydryas editha bayensis Bay checkerspot butterfly	IILEPK4055	Threatened		G5T1	S1	
13	Fritillaria liliacea fragrant fritillary	PMLIL0V0C0			G2	S2.2	1B/2-2-3
14	Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered		G1	S1.1	1B/3-3-3
15	Malacothamnus arcuatus arcuate bush mallow	PDMAL0Q0E0			G2Q	S2.2	1B/2-2-3
16	Malacothamnus hallii Hall's bush mallow	PDMAL0Q0F0			G1Q	S1.2	1B/3-2-3
17	Microcina homi Hom's micro-blind harvestman	ILARA47020			GNR	S1	
18	Plagiobothrys glaber hairless popcorn-flower	PDBOR0V0B0			GH	SH	1A/ *
19	Streptanthus albidus ssp. albidus Metcalf Canyon jewel-flower	PDBRA2G011	Endangered		G2T1	S1.1	1B/3-3-3
20	Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010			G1	S1.1	1B/3-3-3
21	Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2T3	S2S3	

Attachment C
Observed Plant and Wildlife Species List

Plant Species Observed within the Los Esteros Project Alignment

Scientific Name	**Common Name**
Acer negundo var. *californicum*	Box elder
*Agrostis avenacea**	Pacific bentgrass
*Ailanthus altissima**	Tree of heaven
Artemisia douglasiana	mugwort
Aster chilensis	aster
Atriplex triangularis	spearscale
*Avena fatua**	wild oats
Baccharis pilularis	coyote brush
*Brassica nigra**	black mustard
*Bromus diandrus**	foxtail brome
*Bromus hordeacus**	soft chess
*Conium maculatum**	poison hemlock
*Cynodon dactylon**	Bermuda grass
Distichlis spicata	saltgrass
Epiliobium ciliatum	fireweed
Euthamia occidentalis	Western goldenrod
*Foeniculum vulgare**	fennel
Grindelia hirsutula var. maritima	coastal gumweed
*Hordeum marinum**	Mediterranean barley
Juglans californica	California walnut
*Lepedium latifolium**	perennial peppergrass
*Lolium perenne**	perennial ryegrass
*Lythrum hyssopifolia**	loosestrife
*Malvella leprosa**	alkali mallow
Nasturtium officinale	watercress
*Picris echioides**	bristly ox-tongue
*Piptatherum miliaceum**	smilo grass
Platanus racemosa	California sycamore
Polygonum amphibibium var. *emersum**	Knotweed
*Polypogon monospeliensis**	annual rabbitsfoot grass
Populus fremontii ssp. *fremontii*	Fremont's cottonwood
Quercus agrifolia	Coast live oak
*Raphanus sativus**	wild radish
*Rubus armeniacus**	Blackberry
*Rumex crispus**	curly dock
*Salix babylonica**	Weeping willow
Salix exigua	Sandbar willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
*Salsola soda**	Russian thistle
Sambucus mexicana	Blue elderberry
Scirpus americanus	American tule
Scirpus californicus	California bulrush
*Schinus molle**	Peruvian pepper tree
*Schinus terebinthifolius**	Brazilian pepper tree

Scientific Name	**Common Name**
*Silybum marianum**	milk thistle
Typha angustifolia	narrow-leaved cattail
Typha latifolia	broad-leaved cattail
*Veronica anagallis-aquatica**	water speedwell
*Vulpia myuros**	rat-tail fescue
Xanthium strumarium	Cocklebur
*Vulpia myuros**	rat-tail fescue

Animal Species Observed within the Los Esteros Project Alignment

Scientific Name	**Common Name**
Agelaius phoeniceus	red-winged blackbird
Anas platyrhynchos	Mallard
Aphelocoma californica	western scrub jay
Ardea alba	great egret
Ardea herodias	great blue heron
Athene cunicularia	Western burrowing owl
Buteo jamaicensis	red-tailed hawk
Calypte anna	Anna's hummingbird
Carduelis psaltria	lesser goldfinch
Cathartes aura	turkey vulture
Cistothorus palustris	marsh wren
Columba livia	rock dove
Corvus brachyrhynchos	American crow
Dendroica coronata	yellow-rumped warbler
Egretta thula	snowy egret
Euphagus cyanocephalus	Brewer's blackbird
Falco sparverius	American kestrel
Icterus bullockii	Bullock’s oriole
Larus occidentalis	western gull
Lepus californicus	Black-tailed jackrabbit
Melospiza melodia	song sparrow
Mimus polyglottos	northern mockingbird
Petrochelidon pyrrhonata	cliff swallow
Pipilo crissalis	california towhee
Procyon lotor	Raccoon
Sayornis nigricans	black phoebe
Sitta carolinensis	White breasted but hatch
Spermophilus beecheyi	California ground squirrel
Sturnella neglecta	western meadowlark
Sturnus vulgaris	European starling
Zenaida macroura	mourning dove
Zonotrichia leucophrys	white-crowned sparrow

Attachment D
Special-Status Species Accounts

Special-Status Species Accounts

Plants

Congdon's Tarplant

Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*) is a CNPS List 1B species. Congdon's tarplant is an annual plant that grows in alkaline and/or sandy soils in foothill and valley grasslands, typically in mesic areas where water collects. It is usually found growing with mustard, rattlesnake grass (*Briza minor*), star thistle (*Centaurea* sp.), horseweed (*Conyza canadensis*), bristly ox tongue, dock (*Rumex maritimus*), senecio (*Senecio californicus*), and vulpia (*Vulpia myuros*). It flowers from June to November.

Hall's Bush Mallow

Hall's bush mallow (*Malacothamnus hallii*) is a CNPS List 1B species. Hall's bush mallow is a perennial shrub that grows in rocky and/or sandy soils in coastal scrub, chaparral, and some times in foothill and valley grasslands, typically in mesic areas where water collects. In grassland habitats, it has been found in disturbed areas growing with mustard, star thistle, bristly ox tongue, and dock. It flowers from May to September.

Fish

Green Sturgeon

Green sturgeons (*Acipenser medirostris*) are long-lived, slow-growing fish and the most marine-oriented of the sturgeon species. The NMFS lists the green sturgeon Southern DPS as threatened, including populations in the Sacramento River and its tributaries to the San Francisco Bay. Mature males range from 1.4-2 m (4.5-6.5 ft). They utilize both freshwater and saltwater habitat and spawn in deep pools or "holes" in large, turbulent, freshwater river mainstems. Specific spawning habitat preferences are unclear, but eggs likely are broadcast over large cobble substrates, but range from clean sand to bedrock substrates as well. Green sturgeons are believed to spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. Today's green sturgeons are believed to spawn in the Rogue River, Klamath River Basin, and the Sacramento River.

Steelhead

Central California Coast Steelhead (CCCS) (*Oncorhynchus mykiss irideus*) is an anadromous form of rainbow trout that migrates upstream from the ocean to spawn. CCCS usually spawn in clear, cool, perennial sections of relatively undisturbed streams. Preferred streams typically support dense canopy cover that provides shade, woody debris, and organic matter. Streams in which spawning occurs are usually free of rooted or aquatic vegetation. Eggs are laid in gravel substrates in pools. CCCS usually cannot survive long in pools or streams with water temperatures above 21°C (70°F). Despite their general requirement for cool water, CCCS can use warmer habitats if food is available, such as at fast water riffles where fish can feed on drifting insects.

CCCS typically spawn between December and April, when stream flows are adequate to allow upstream migration. CCCS eggs remain in gravel depressions, known as redds, for 1.5 to 2.5 months before hatching and emerging from their redds. After hatching, young CCCS use the shallow protected stream margin areas of deeper reaches of streams as rearing areas and will remain in freshwater systems for 1 to 4 years before migrating to the ocean. After migration, CCCS typically grow rapidly for 2 to 3 years in the ocean before returning to freshwater streams to spawn. Unlike other salmonids, CCCS do not necessarily die after spawning. Many adults survive and return to the ocean after spawning, coming back to spawn for one or more additional seasons.

CCCS populations have declined due to degradation of spawning habitat, introduction of barriers to upstream migration, over-harvesting by recreational fisheries, reduction in winter flows due to damming, and reduction in spring flows due to water diversion. CCCS and other salmonids have been categorized into subpopulations, referred to as evolutionarily significant units (ESU) or distinct population segments (DPSs). In 1997, the National Oceanic and Atmospheric Administration (NOAA)-Fisheries published a final rule to list the Central California Coast ESU as threatened under the Federal Endangered Species Act (FESA). In January 2006, NOAA-Fisheries officially switched from the concept of ESUs to DPSs as defined in FESA. The new DPSs are equivalent to the previously-defined ESUs.

Chinook Salmon

Central Valley Chinook salmon (*Oncorhynchus tshawytscha*) is a federally-threatened species and state-threatened species. California streams support the southernmost Chinook salmon runs on the west coast. Chinook salmon in California display a wide array of life history patterns that allow them to take advantage of the diverse and variable riverine and ocean environments. Chinook salmon are “anadromous” fish, migrating upstream as adults to

spawn in freshwater streams and migrating as juveniles downstream to the ocean to grow and mature. The time spent in the ocean and freshwater varies greatly among the various runs.

Four distinct runs of Chinook salmon spawn in the Sacramento-San Joaquin River system, named for the season when the majority of the run enters freshwater as adults. Fall-run Chinook migrate upstream as adults from July through December and spawn from early October through late December. The timing of runs varies from stream to stream. Late fall-run Chinook migrate into the rivers from mid-October through December and spawn from January through mid-April. The majority of young salmon of these races migrate to the ocean during the first few months following emergence, although some may remain in freshwater and migrate as yearlings. They are currently the most abundant of the Central Valley races, contributing to large commercial and recreational fisheries in the ocean and popular sport fisheries in the freshwater streams. Fall-run Chinook are raised at five major Central Valley hatcheries that release more than 32 million smolts each year. Recently, genetic testing on Guadalupe river fall-run Chinook salmon has demonstrated that these fish do not belong to a naturally spawn populations, but derive from hatchery stock and it is not known if they have naturalized. Therefore, their special-status designation does not apply to the South Bay populations (Hedgecock and Garcia-Rossi, 2002 cited in SCVWD, 2008).

Longfin Smelt

Longfin smelt (*Spirinchus thaleichthys*) are pelagic, estuarine fish which range from Monterey Bay to Alaska. In California, they have been commonly collected from San Francisco Bay, Eel River, Humboldt Bay and Klamath River. The CDFG lists the longfin smelt as a state candidate species including populations in the Sacramento River and its tributaries to the San Francisco Bay as of February 2008. Currently, the longfin smelt is known from the Klamath River and San Francisco Bay tributaries, including Alviso Slough. As they mature in the fall, adults found throughout San Francisco Bay may migrate to brackish or freshwater in Suisun Bay, Montezuma Slough, Alviso Slough, and the lower reaches of the Sacramento and San Joaquin Rivers. Spawning begins in November and extends to June.

Amphibian

California Red-Legged Frog

The California red-legged frog (*Rana aurora draytonii*) (CRLF), the largest native frog in California, is federally listed as threatened and is a state species of special concern. CRLF occupy dense, shrubby, or emergent riparian or wetland vegetation closely associated with

ponds or deep, slow-moving water. Well-vegetated terrestrial areas within riparian corridors provide important sheltering habitat during winter. CRLF breed in ponds or slow-moving pools in streams. Habitats that contain the highest densities of CRLF are associated with deep-water pools (>0.7 m [2.3 ft] deep) with stands of overhanging willows (*Salix* spp.) and an intermixed fringe of cattails (*Typha latifolia*), tules (*Scirpus* spp.), or sedges. Continued survival of frogs in all aquatic habitats seems to be based on the continued presence of ponds, springs, or pools that are disjunct from perennial streams. Such habitats provide the continued basis for successful reproduction and recruitment year after year into nearby drainages that may lose frog populations due to stochastic events such as extreme flooding or droughts (USFWS, 2001).

Breeding typically occurs from late November through early May, after the onset of warm rains. Most larvae metamorphose into juvenile frogs (at 25 to 30 mm [0.98 to 1.2 in] total length) between July and September, although there are scattered observations of overwintering larvae in perennial ponds. CRLF may move away from breeding sites to forage in other aquatic habitats during summer, although if habitat is suitable at breeding ponds, individuals may remain there year-round (USFWS, 2001).

Reptiles

Western Pond Turtle

Western pond turtle (*Emys marmorata marmorata*) is a state species of special concern. The western pond turtle ranges in size from 8.89 to 17.78 cm (3.5 to 7 in) and is the only freshwater turtle native to the Bay Area. It occurs in ponds and small lakes with abundant vegetation. It is also found in marshes, slow-moving streams, reservoirs, and occasionally brackish water. The western pond turtle feeds on aquatic plants, such as pond lilies, beetles, aquatic invertebrates, fishes, frogs, and carrion. It requires basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks, as well as underwater retreats to hide from predators and humans. Females deposit their eggs in nests in sandy banks or, in the case of foothill streams, in upland areas away from the stream. Nests have been observed in many soil types, from sandy to very hard, and have been found up to 100 m (325 ft) from the water. Hatchlings and juveniles are preyed on by certain fish species, bullfrogs, garter snakes, wading birds, and some mammals. Habitat for this species occurs in the Guadalupe River, adjacent to Reach 9. In this situation, the turtle is expected to remain within the riparian corridor and marsh along the Guadalupe River because it provides habitat that is superior to the adjacent habitats.

Southwestern pond turtle

The southwestern pond turtle (*Emys marmorata pallida*) is a subspecies of the western pond turtle (described above). It is a state species of special concern. The southwestern pond turtle prefers quiet waters of ponds, lakes, streams, and marshes. This species would inhabit reaches of streams that contain deep pools, from 0.9 to 1.5 m (3.0 to 5.2 ft) in depth (Stebbins, 1972). They typically inhabit the largest and deepest pools along streams containing large amounts of basking sites, including fallen trees and boulders. This species can occasionally be found crawling across creek riffles or traversing open fields during transient movements.

Resident and Migratory Birds

Cooper's Hawk

The Cooper's hawk (*Accipiter cooperii*) is classified as a species of special concern by CDFG. It is known to breed from southern Canada to northern Mexico. Individuals from most of the Canadian and northern U.S. range migrate in winter and some as far south as Panama. The Cooper's hawk is known to nest in woodlands dominated by deciduous riparian species throughout California. Foraging habitat consists of many habitats, including shrublands and grasslands near their breeding grounds.

The average adult male, at 312 g (.70 lb), 39 cm (15 in) long and a wingspan of 73 cm (29 in), is considerably smaller than the average female, at 500 g (1.1 lb), 45 cm (18 in) long and a wingspan of 83 cm (33 in). All have short broad wings and a long, round-ended tail with dark bands. Adults have a dark cap, blue-gray upper parts and white under parts with reddish bars. They have red eyes and yellow legs. Immature individuals have brown upper parts and pale under parts with thin streaks mostly ending at the belly.

Sharp-shinned Hawk

The sharp-shinned hawk (*Accipiter striatus*) is classified by CDFG as a state species of special concern by CDFG. It is known to breed from Canada to Mexico and continue down through Central America. Individuals from most of the Canadian and northern U.S. range migrate in winter and some as far south as Panama. The sharp-shinned hawk is known to nest and forage in Jeffery pine, Ponderosa pine, mixed conifer, black oak, and riparian deciduous woodlands throughout California. Foraging habitat also consists of shrublands and grasslands near their breeding grounds.

Males are 24 to 30 cm (9.5 to 12 in) long, have a wingspan of 52 to 58 cm (20 to 23 in), and weigh from 87 to 114 g (0.20 to 0.25 lb). As common in *Accipiter* hawks, females average distinctly larger at a length of 29 to 37 cm (11.5 to 14.5 in), a wingspan of 58 to 68 cm (23 to 27 in), and a weight of 150 to 218 g (0.33 to 0.50). Measurements given here are for the northern group, but they are comparable for the remaining. Adults have short broad wings and a long square-ended tail banded in blackish and grey (often narrowly tipped white).

Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor*) is a state species of special concern. It ranges in size from 19 to 23 cm (7.5 to 9 in). It is similar to the red-winged blackbird, but the red shoulder patch is darker, with a conspicuous white margin. The female is much darker than most races of the redwing. They nest in dense colonies often numbering many thousands. Their range is from southern Oregon to northwest Baja California. Nesting habitat for this species includes freshwater and brackish water marshes. Foraging habitat includes grasslands, agricultural fields, pastures, and farms (Peterson, 1990).

Bald Eagle

The bald eagle (*Haliaeetus leucocphalus*) is listed as a state endangered species and a state fully-protected species by the CDFG. Bald eagles are found over most of North America from Alaska and Canada to northern Mexico. It nests in tall trees and on cliffs. Foraging habitat consists of rivers, lakes, seashores, and freshwater systems. Its body length ranges from 71 to 96 cm (28 to 38 in), with a wingspan of 168 to 244 cm (66 to 88 in) and a weight of 3 to 6.3 kg (6.6 to 14 lb); females are about 25 percent larger than males. The adult bald eagle has a brown body with a white head and tail, bright yellow irises, and a hooked beak. Juveniles are completely brown except for the yellow feet. Males and females are identical in plumage coloration. Its diet consists mainly of fish, but it is an opportunistic feeder. The species was on the brink of extirpation in the continental United States late in the 20th century but now has a stable population and has been officially removed from USFWS endangered species list as of June 28, 2007.

Great Blue Heron

The great blue heron (*Ardea herodias*) is classified by CDFG as a state species of special concern. It ranges in size from 106 to 132 cm (42 to 52 in) in height. It is a lean gray bird that may stand up to 4 ft tall. It has long legs, a long neck, a dagger-like bill, and, in flight, a folder neck. Great size, its blue-gray color, and its white head (in adults) mark it as this species. Its range is from southern Canada to Mexico. The species winters in northern South

America. Habitat for this species includes freshwater marsh, brackish marsh, swamps, shores, and tidal flats (Peterson, 1990).

Short-eared Owl

The short-eared owl (*Asio flammeus*) is classified by CDFG as a state species of special concern. The short-eared owl nests on the ground within tall emergent marshland habitat including freshwater and brackish marshes in addition to grassland habitats. They are found foraging over many open habitats within California. The plumage is brown with dark streaks on the chest, belly, and back. Males tend to be lighter in color than females. They typically range in length from 33 to 43 cm (13 to 17 in) with an average wingspan of 105 to 107 cm (41 to 42 in). They typically weight 206 to 475 g (0.45 to 1 lb) at the adult stage where females are slightly larger than males. Short-eared owls are generally diurnal, but most active at dusk and dawn, but have been observed hunting at night. They are known to eat small mammals and occasionally small birds.

Western Burrowing Owl

Western burrowing owl (*Athene cunicularia*) is a state species of special concern. In the South Bay, the burrowing owl (BUOW) is a year-round resident of open, dry grassland. This habitat has been rapidly developed, causing significant declines in the local population. The BUOW uses primarily ground squirrel burrows for cover and nesting; it usually does not excavate its own new burrow. It prefers open, flat habitat with short mounds or perch sites. Breeding generally occurs in spring and summer and usually just one brood is produced. The CDFG considers the breeding season to generally extend from February 1 to August 31.

Northern Harrier

The northern harrier (*Circus cyaneus*) is a California state species of special concern. It occurs from annual grassland up to lodgepole pine and alpine meadow habitats as high as 3,000 m (10,000 ft). It breeds from sea level to 1,700 m (0 to 5,700 ft) in the Central Valley and Sierra Nevadas and up to 800 m (3,600 ft) in northeastern California. It frequents meadows, grasslands, open rangelands, desert sinks, and fresh and saltwater emergent wetlands. Northern harriers are permanent residents of the northeastern plateau and coastal areas. The California population has decreased in recent decades (Grinnell and Miller, 1944; Remsen, 1978) but can be locally abundant where suitable habitat remains free of disturbance, especially from intensive agriculture. Destruction of wetland habitat, native grassland, and moist meadows, as well as burning and plowing of nesting areas during early stages of breeding cycle are major reasons for the decline (Remsen, 1978). Northern harriers

feed mostly on voles and other small mammals, birds, frogs, small reptiles, crustaceans, insects and, rarely, on fish. Nests are constructed on the ground in shrubby vegetation, usually at marsh edges (Brown and Amadon, 1968). Northern harrier nests are built as a large mound of sticks on wet areas and a smaller cup of grasses on dry sites. Harriers mostly nest in emergent wetland or along rivers or lakes but may nest in grasslands, grain fields, or on sagebrush flats several miles from water (Polite, 2005). The breeding season is from March to September, with peak activity June through July. The nestling period lasts about 53 days (Craighead and Craighead, 1956). Breeding pairs and juveniles may roost communally in late autumn and winter.

American Peregrine Falcon

The American peregrine falcon (*Falco peregrinus anatum*) is a state endangered and state fully-protected species. The peregrine falcon requires cliffs or cliff-like habitat for nesting (i.e., high-rise buildings have been used in past instances). It forages in the region, but nesting habitat for peregrine falcon is not present in the study area. Foraging habitat occurs throughout the BSA. Nesting occurs in spring and summer, and these birds typically produce only one brood. The American peregrine falcon has a body length of 34 to 50 cm (13 to 20 in) and a wingspan of around 80 to 120 cm (31 to 47 in). The male and female have similar markings and plumage, but as in many birds of prey, this species displays marked reverse sexual dimorphism in size, with the female measuring up to 30 percent larger than the male. Males weigh 440 to 750 g (1.0 to 1.65 lb), and the noticeably larger females weigh 910 to 1500 g (2.0 to 3.3 lb).

California Yellow Warbler

The California yellow warbler (*Dendroica petechia brewsteri*) is classified by CDFG as a state species of special concern. It breeds in temperate North America as far south as central Mexico in open, often wet, woodland or shrublands. It is migratory, wintering in Central and South America. It is 11.5 cm (4.5 in) in length and weighs 9 g (0.3 oz). In California, this species breeds in riparian woodlands dominated by willows and cottonwoods. Foraging habitat consists of open upland areas adjacent to their breeding grounds.

White-tailed Kite

The white-tailed kite (*Elanus leucurus*) is a state species of special concern. It is know to nest in the riparian zones within the Santa Clara Valley and forage in all vegetation types. The white-tailed kite requires tall tree canopy or dense, tall shrubs for nesting. It forages in the region, but nesting habitat for white-tailed kite is not present in the study area. Nesting

occurs in spring and summer and these birds typically produce only one brood. The white-tailed kite has a body length of 35 to 43 cm (14 to 17 in), more than a 1-m (3.3-ft) wingspan, and weighs 300 to 360 g (0.6 to .80 lb). Populations have declined due to urban developments, loss of nesting habitat, and human disturbances.

Salt Marsh Common Yellowthroat

The salt marsh common yellowthroat (*Geothlypis trichas sinuosa*) is a state species of special concern. It ranges in size from 11 to 14 cm (4.5 to 5.5 in) with a wingspan of 15 to 19 cm (6 to 7 in) and a weight of 9 to 10 g (.32 to .35 oz.). They are migratory birds with a range that spans from Canada to southern Mexico. The species winters in the southern United States to Panama. Habitat for this species includes swamps, marshes, wet thickets, and edges with low growing vegetation (Peterson, 1990). They have brown backs, yellow throats, and white bellies. Adult males have black face masks, which are bordered above with gray. Females are similar in appearance, but do not have the black mask.

Loggerhead Shrike

The loggerhead shrike (*Lanius ludovicianus*) is a state species of special concern. The loggerhead shrike requires dense upland habitats for nesting including coastal scrubs, chaparral, and forested areas. Foraging habitat consists of grasslands, marshes, and disturbed habitats. Both nesting and foraging habitat occurs throughout the BSA. Nesting occurs between March and August with typically two broods produced, sometimes three. Nestlings leave the nest between 17 and 21 days and are independent by day 45. The loggerhead shrike has a body length of 20 to 23 cm (8 to 9 in) and a wingspan of around 28 to 32 cm (11 to 13 in). Males and females weigh between 35 to 50 g (1.24 to 1.77 oz).

White-faced Ibis

The white-faced ibis (*Plegadis chihi*) is listed by CDFG as a state species of special concern. The white-faced ibis is a dark wading bird with a long, down-curved bill with long dark legs and body. It is distinguished by a white border around the face during the breeding season. The white-faced ibis breeds in freshwater and brackish marshlands across western U.S. northward to Montana, eastward to Louisiana and southward to South America. It is known to winter from southern California and Louisiana southward. The white-faced ibis is a small water bird ranging in size from 46 to 56 cm (18 to 22 in) with a weight of approximately 450 to 525 g (15 to 18.5 oz).

Black Skimmer

The black skimmer (*Rhynchops niger*) is listed by CDFG as a state species of special concern. The black skimmer is distinct from most water birds for its large red and black bill. Its bill is very thin and characterized by having the lower mandible longer than the upper. During its feeding ritual, the bird drags the lower bill through the water as it flies along surface trying to catch small fish and marine invertebrates. It is a medium sized to large water bird ranging from 40 to 50 cm (16 to 20 in) and weighing 212 to 447 g (7 to 16 oz.). They breed throughout North America and are known to breed in the South Bay Area, typically along abandoned levees and on islands within the Salt Evaporation Ponds near Alviso (SCVWD, 2008).

California Least Tern

The California least tern (*Sterna antillarum browni*) is a federally-endangered and state-endangered species. It is a small tern, about 9 in with a 50 cm (20-inch) wingspan. It is mostly white and pale gray and wingtips are black. The head of the adult has a black cap and white forehead, and the yellow beak is black-tipped. This migratory bird winters in Central and South America, but the winter range and habitats are unknown. The nesting range is along the Pacific coast from southern Baja California to San Francisco Bay. Least terns usually arrive in California in April and depart in August. They nest in colonies on bare or sparsely vegetated flat substrates near the coast. Development and recreational use have largely eliminated the natural nesting habitats of this species. Typical nesting sites are now on isolated or specially protected sand beaches or on natural or artificial open areas in remnant coastal wetlands. These sites are typically near estuaries, bays, or harbors where small fish are abundant.

Mammals

Pallid Bat

The pallid bat (*Antrozous pallidus*) is listed by CDFG as a state species of special concern. The pallid bat is a species of vesper bat in the Vespertilionidae family. It is found in Canada, Mexico, and the United States. It averages 115 mm (4.5 in) long and weights 12 to 17 grams (423 to 600 oz.). Usually pallid bats roost in rock crevices, buildings, tree cavities, or under bridges. Pallid Bats are insectivores so they feed on insects such as crickets and scorpions, and are capable of consuming up to half their weight in insects every night. Although they normally catch their prey on the ground, they usually transport their prey to their night roost to eat it. Their large ears allow them to hear the footsteps of insects on the ground and they

use their voices to make ultrasonic sounds that bounce back to their ears. The mating season ranges from October to February. The female bat gives birth to twins during early June.

Townsend's Big-eared Bat

The Townsend's big-eared bat (*Corynorhinus townsendii*) is listed by CDFG as a state species of special concern. The Townsend's big-eared bat is a species of vesper bat in the Vespertilionidae family. It is found throughout the western United States. It averages 100 mm (3.5 in) long and weights 7 to 12 grams (280 to 423 oz.). It is characterized by having very large ears. Townsend's big-eared bat is found throughout California in a wide variety of habitats but mostly in mesic sites where there are caves, trees, or man-made structures such as abandoned buildings suitable for roosting. Townsend's big-eared bat feeds by flying very low over the surface as it is a riparian obligate species. Its principal foods are midges, moths, termites, and other small insects. Summer maternity colonies range in size from a few dozen to hundreds of individuals. These colonies form between March and June (depending on climate), with pups born between May and July. Maternity colonies choose sites that have warm, stable temperatures for pup rearing. Males remain solitary during the maternity season. Winter hibernation colonies are comprised of males and females and range in size from a few individuals to several hundred bats.

Hoary Bat

The Hoary bat (*Lasiurus cinereus*) is listed by CDFG as a state species of special concern. The Hoary bat is a species of vesper bat in the Vespertilionidae family. It is found in Canada and the United States and is known to be migratory. It averages 135 mm (5.3 in) long and weights 26 grams (900 oz.). Hoary bat feeds by flying very low over the surface of water as it is a riparian obligate species. Its principal foods are midges, moths, termites, and other small insects. During the breeding season, the males usually remain alone. Nursery colonies form in places that have high, stable temperatures. Usually a colony assembles in caves, mines, buildings, tree cavities, rock crevices, or under bridges.

Yuma Myotis

The Yuma myotis (*Myotis yumanensis*) is listed by CDFG as a state-threatened and state-protected species. The Yuma myotis is a species of vesper bat in the Vespertilionidae family. It is found in Canada, Mexico, and the United States. It averages 78 mm (3 in) long and weights 4 to 8 grams (140 to 280 oz.). Yuma Myotis feeds by flying very low over the surface as it is a riparian obligate species. Its principal foods are midges, moths, termites, and other small insects. During the breeding season, the males usually remain alone. Nursery

colonies form in places that have high, stable temperatures in the range of 30 to 55°C (86 to 131°F). Usually a colony assembles in caves, mines, buildings, tree cavities, rock crevices, or under bridges or the bark of trees; these colonies may contain thousands of individuals.

ATTACHMENT B

LOS ESTEROS CRITICAL ENERGY FACILITY (LECEF); CULTURAL RESOURCES ASSESSMENT

Cultural Site Assessment for the Los Esteros Critical Energy Facility Reconductoring of the Trimble-San Jose B 115kV Transmission Line

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DATE: October 26, 2009

Introduction

As requested by Calpine Corporation (Calpine), CH2M HILL has conducted an environmental review of the reconductoring of the Trimble-San Jose B 115kV Transmission Line in support of the Los Esteros Critical Energy Facility Amendment #4 to specifically address potential impacts to cultural resources from the project. A field survey by Aaron Fergusson, Cultural Resources Specialists of CH2M HILL, was conducted on October 13, 2009. No cultural resources were observed.

The project considered for cultural resources impacts will involve two upgrades to Pacific Gas & Electric's (PG&E) transmission system. The Area of Potential Effects (APE) for cultural resources includes approximately 1.01[1] miles of the 115 kV transmission line from the Trimble Substation to Pole 12/81 (Line A), and 0.07 mile of the 115 kV transmission line of Pole 3/23 to the San Jose B Substation takeoff structure (Line B) . Both Line A and Line B will need to be reconductored. Reconductoring of a transmission line involves the replacement of existing aboveground electrical transmission wire (conductor) with new wire on the existing poles and should not involve any ground disturbing activities. All reconductoring activities would be constrained to within the area surveyed for the APE.

Line A begins at the Trimble substation take-off structure and runs southwest in the center meridian of Component Drive. The line continues southwest through the intersection of Orchard Parkway and Component Drive through undeveloped fields for 0.45 miles until it reaches a pole adjacent to the Guadalupe River. At this point, the line turns south/southeast for approximately 0.31 miles, crossing Highway 101, just west of the intersection of Highway 101 and Highway 87/Guadalupe Parkway. The line continues in a generally southeast direction crossing the car rental facility for the San Jose International Airport, and

[1] The project area surveyed was larger than the proposed 1.01 mile segment and the 0.07 mile segment.

running generally parallel to Guadalupe Parkway for 0.25 miles. The line continues southeast through the car rental facility, running adjacent to the Guadalupe River for 0.18 mile, and eventually crossing the canal to its terminus at pole 12/81, which is located north of Brokaw Road, east of Airport Road, and west of Guadalupe Parkway. Along this portion of the route, the towers are located in medians, parking lots, wooded riparian areas, and fallow fields.

Line B begins at pole 3/23 located north of Coleman Road, and East of Vendome Road, and heads east to the San Jose Substation Take off structure located 0.07 miles to the east of Pole 3/23 within the Guadalupe River Park Trail and Gardens. The route crosses a grassy, landscaped area. The towers are located at the interface between Vendome Road and the grassy area, and the Substation take off structure is located within a paved area.

The archaeological sensitivity of the APE is considered low based on the significant amount of ground disturbance and the modern built environment around the APE. A summary of findings for archaeological and architectural resources is presented below. Attached Figure 1 depicts the area surveyed for cultural resources.

Affected Environment

In central California, cultural resources extend back in time for at least 11,500 years. Written historical sources tell the story of the past 200 years. Archaeologists have reconstructed general trends of prehistory in central California.

Generally, prehistoric resources uncovered in this area exhibit traits of both the Central Valley cultures as well as those of the San Francisco Bay Area. Generally, the proposed chronologies of the Central Valley, as well as of the Bay Area, are variations based on the general California chronology, which consists of an Early Horizon, a Middle Horizon, and a Late Horizon (Fredrickson, 1974; Elsasser, 1978). However, wide regional differences in central California, as well as significant temporal overlap between site types classified into these three horizons, prevented clear distinctions between horizons. Eventually, a model was proposed for central California that primarily emphasized the patterns of cultural identity and deemphasized associated occupation dates (Moratto, 1984).

Prehistoric Period

The general trend throughout California prehistory has been an increase in population density over time, coupled with greater sedentism and the use of a greater diversity of food resources. There is abundant evidence that humans were present in the New World for at least the past 11,500 years. There is also fragmentary, but growing, evidence that humans were present long before that date. Linguistic and genetic studies suggest that a date of 20,000 to 40,000 years ago for the human colonization of the New World may be possible. The evidence of this earlier occupation is not yet conclusive, but it is beginning to be accepted by archaeologists. The Meadowcroft Rockshelter in Pennsylvania and Monte Verde in Chile, for instance, are two early sites that have produced apparently reliable dates as early as 12,500 years before present. These earliest known remains indicate very small, mobile populations, apparently dependent on hunting of large game animals as the primary subsistence strategy.

Early sites in the region are Fluted Point Tradition and Western Pluvial Lakes Tradition sites found at Tracy, Tulare, and Buena Vista lakes. These sites are few in number and remain undated by scientific means but the assemblage types indicate probable ages of 11,500 to 7,500 years old (Moratto, 1984).

Windmiller Pattern

The Windmiller Pattern generally coincides with Fredrickson's Early Horizon (1974) and the majority of the known Windmiller Pattern sites date to approximately 5,000 to 2,250 years ago. A small number of Windmiller sites date as late as 1,250 to 750 years ago. Windmiller populations moved seasonally between the valleys in the winter and the Sierra Nevada foothills in the summer. Windmiller groups within the Delta region acquired obsidian from the Coast ranges, shells from the coast, and quartz and alabaster from the Sierra foothills. Windmiller burials within the Delta are found within the settled villages as well as in cemeteries separate from habitation areas. Fishing and hunting were the primary subsistence strategies and Windmiller sites are characterized by tools related to hunting, fishing, as well as milling and include mortars, baked clay balls, trident fish spears, two types of angling hooks, pecan sized baked clay that appear to have been used as fish line sinkers, bone awls and needles, polished charmstones, shell working and shell appliqué, and flaked tools, including projectile points (Moratto, 1984).

Berkeley Pattern

The Berkeley Pattern coincides roughly with the Middle Horizon and the majority of known Berkeley Pattern sites date to approximately 2,500 to 1,250 years ago. A small number of Berkeley sites extend outside of this time frame and date as early as 3,200 years ago and as late as 500 years ago. The Berkeley Pattern appears to be a Bay region development which spread to the Delta region and the Valley beyond. In response to environmental technological factors, economies became more diversified, and sedentism developed further while population growth and expansion occurred. The Berkeley Pattern subsistence relied less on hunting and fishing than the Windmiller Pattern; rather the focus appears to have been on acorns. Mortars and pestles are present in far greater numbers at Berkeley sites. Other artifacts characterizing Berkeley sites include greater numbers of bone tools of superior manufacture, distinctive diagonal flaking of large concave base points, shell beads and ornaments.

Augustine Pattern

The Augustine Pattern coincides approximately with the Late Horizon and generally dates from 1,250 to 250 years ago. Augustine Pattern sites are much more widespread than Berkeley Pattern sites and are characterized by intensive fishing, hunting, and acorn gathering. Population densities are much higher; exchange systems are more sophisticated and include the advent of using clamshell disk beads for good exchange. High variability in funerary artifacts seems to indicate more social stratification. Cremations and flexed burials are common. Artifacts associated with the Augustine Pattern include the bow and arrow, shaped mortars and pestles, and pottery in some parts of central California (Moratto, 1984).

Ethnographic Setting

Costanoan, so named for the Spanish word, Costaños, or 'coast people', designates a language family of eight distinct and separate languages. When Europeans first arrived in the Bay Area, the Costanoan speakers were comprised of nearly 50 separate autonomous nations, or tribelets, each of which lived in one or more permanent villages. The average size of each tribelet was approximately 200 persons. Larger tribelets consisted of up to 500 persons living in several closely located villages. The Chochenyo or East Bay Costanoan occupied the east shore of the San Francisco Bay in the area near the Mission San José.

Territorial boundaries of the individual tribelets appear to have been based on physiographic features. Chiefs could be either men or women; however the position was generally a patrilineally inherited one and required the approval of the village. Women could win the position when no suitable male heir was available. The chief's responsibilities included directing ceremonial activities, directing hunting, fishing, and gathering expeditions, caring for captive bears and coyotes, and providing for visitors and for impoverished villagers.

Villages were organized by clan and households generally consisted of patrilineally extended families. Buildings were domed structures thatched with tule grass on a framework of poles tied with willow. Doorways were rectangular and the fireplace was usually located in the center of the building. Villages also contained a sweathouse which could accommodate up to eight persons and often located next to a stream. Villages also often contained an assembly house and a dance plaze, which would be found at the center of the village. Dance enclosures with a single doorway or small opening were oval or circular.

Much like many other groups in California, the Costanoan depended heavily upon the acorn, which was the main food staple. Costanoans practiced controlled burning to promote seed growth of seed bearing annuals. This burning also provided large areas for grazing deer, elk, and antelope, which were hunted by the Costanoans and easier access to acorns. Roots, wild onions, cattail roots, buckeye nuts, hazelnuts, seeds, and several varieties of clover shoots were also collected. Other animals hunted included grizzly bear, mountain lion, raccoon, brush rabbit, cottontails, jackrabbit, squirrels, mouse, mole, and stranded sea lions and whales. Waterfowl were a very important part of the Costanoan diet and a wide variety of fish were utilized, as well. Steelhead trout, salmon, sturgeon, and lampreys were caught with nets, spears, basket fish traps, or hook and line assemblies.

Sebastian Vizcaino landed in Monterey in 1602 and appears to have been the first Spaniard to record interactions with the Costanoans. Several expeditions into Costanoan territory during the Spanish Period included Portola's expedition in 1769, Fages' expeditions in 1770 and 1772, de Anza's expeditions in 1774 and 1776, and Moraga's expedition in 1776. Seven missions were founded in Costanoan territory between 1770 and 1797, including the Mission San José. The mission system severly disrupted the Costanoan lifeways and the introduction of disease caused Costanoan populations to decline from 10,000 persons in 1770 to approximately 2,000 persons in 1832. The mission system also brought other groups from California into Costanoan territory. At the Mission San José, Northern Valley Yokuts, Plains Miwok, Coast Miwok, and Patwin lived with the local Costanoans.

When the missions were secularized during the Mexican Period, Costanoans left the missions to work as manual laborers on the large Mexican ranchos. During this period, many Costanoans returned to pre-mission lifeways, including food collection and shamanism. In 1971, Costanoans still living in the Bay Area formed the Ohlone Indian Tribe and were given title to the Ohlone Indian Cemetery. Many of the Costanoan neophytes who lived at the Mission San José are buried at this cemetery. The Muwekma Ohlone Tribe, comprised of Costanoans from the Mission San José, has a pending petition with the Bureau of Indian Affairs to receive federal recognition, but presently remains non-federally recognized.

Historic Setting

In 1542, Juan Rodriguez Cabrillo explored the California coast by ship. Much of the early exploration of California was conducted this way and the interior of California, including the Delta region of the Central Valley, remained unexplored by Europeans until the beginning of the Spanish Period.

The Spanish period spans the years from 1769 to 1822 in California beginning with the founding of the first mission, the Mission San Diego de Alcala in 1769. It was not until March of 1772 that the first formal European expedition, led by Pedro Fages, that the interior Delta region was explored. The Mission San Francisco was founded in 1776. A measles epidemic swept through the mission in 1806 and many of the neophytes at the mission succumbed to the disease. Although the padres initially intended to move the mission into the Sonoma Valley, Old Mission San Francisco remained standing and the newly constructed mission was referred to as New Mission San Francisco. The Mission San José was situated approximately fifteen miles north of the town of San José in 1797. This mission supplied Russian settlements with grain, had a good vineyard and fruit trees, cattle, horses, sheep, and mules, as well as approximately 3,000 Indian neophytes (Bancroft, 1888). Once constructed, missions were fairly self sufficient with a large labor force and in most cases, quite profitable.

In 1821, Mexico gained independence from Spain and in 1848 the United States formally obtained California in the Treaty of Guadalupe Hidalgo (Cleland, 1941: xiii). The period from 1821–1848 is referred to as the Mexican Rancho Period. It was during this period that large tracts of land termed ranchos were granted by the various Mexican Governors of Alta California, usually to individuals who had worked in the service of the Mexican government.

In 1833, 11 years after gaining independence from Spain, the Mexican government's Secularization Act changed missions into civil parishes, and those natives who had inhabited regions adjacent to a Spanish Period mission were to obtain half of all mission possessions, including land. However, in most instances, this did not occur, and the Secularization Act resulted in the transfer of large mission tracts to politically prominent individuals.

On June 14, 1846, a small number of Californians, mostly of American, rather than Mexican origin and aided by John C. Fremont, an agent of the United States Government, seized control of the citadel of Sonoma from Mexican officials and hoisted a flag with a grizzly bear that read "Republic of California", declaring California a free and independent republic. The

short Bear Flag Revolt resulted in a republic which lasted for less than a month (Hulaniski, 1917). Following the end of hostilities between Mexico and the United States in January of 1847, the United States officially obtained California from Mexico through the Treaty of Guadalupe Hidalgo on February 2, 1848 (Cleland, 1941: xiii). In 1850, California was accepted into the Union of the United States primarily due to the population increase created by the Gold Rush of 1849.

Cultural Resources Survey Results

All project components within the APE of the proposed recondutored transmission lines were subject to a cultural resources inventory, which included a surface pedestrian survey. The results of the resource inventory are presented in the following sections. Figure 1 shows the two transmission lines that would be reconductored. The archaeological survey area includes the two lines to be reconductored and a 50-foot buffer on either side of the transmission line right-of-way.

Archaeological Field Survey

A cultural resources survey of the proposed reconductored transmission lines APE was conducted on October 13, 2009 by Aaron Fergusson, M.A., RPA using pedestrian transects spaced no more than 15 meters apart. Mr. Fergusson surveyed the project facilities and a 50-foot buffer (Figure 1). Opportunistic examination of exposed soils was conducted when possible within the survey areas to determine whether archaeological deposits might be present. Exposed soils, consisting mainly of previously disturbed agricultural sediments and road bed material, were inspected carefully, and no evidence of cultural materials was noted.

Visibility within the project area varied widely. Line A starts at the developed Trimble Substation and travels down the median of Component Drive, where modern development has completely obscured and covered the ground surface. At Trimble Drive, Line A crosses an undeveloped field where ground visibility was excellent due to recent plowing of the field. Line A then crosses the Bayshore Freeway and onto the developed airport and rental car lots and the heavily vegetated Guadalupe River. Line B crosses a small patch of deep grasses along an area that appears to have been subject to reclamation work from turning Vendome Street and the surrounding area into the Guadalupe River Park Trail and Gardens. Ground visibility in this area was nearly zero.

Both Line A and Line B are likely modern transmission lines and would not be considered historic resources. Before the lines are reconductored, the age of the lines would be determined and evaluated for the potential that the transmission lines could be considered historic resources.

No cultural resources were identified during the pedestrian inventory of the reconductoring project area. Due to the modern built environment and the heavy disturbance over much of the project area, the archaeological sensitivity should be considered low.

Recommendations

The pedestrian inventory did not locate any prehistoric or historic sites within the reconductoring project APE.

Despite the lack of archaeological resources in the reconductoring project APE, the project could encounter buried intact cultural resources that have not previously been disturbed or destroyed in sediments near the ground surface due to the project's proximity to the Guadalupe River. Reconductoring of lines does not usually involve disturbance of the ground surface and therefore the chance of finding buried cultural materials is extremely low.

Nevertheless, the reconductoring construction plan will include measures to mitigate any potential adverse impacts that could occur if there were an inadvertent discovery of buried cultural resources. These measures include: (1) designation of an on-call CRS to investigate any cultural resources finds made during construction, (2) implementation of a construction worker training program, (3) procedures for halting construction in the event that there is an inadvertent discovery of archaeological deposits or human remains, (4) procedures for evaluating an inadvertent archaeological discovery, and (5) procedures to mitigate adverse impacts on any inadvertent archaeological discovery determined significant.

If human remains are found during construction, project officials are required by the California Health and Safety Code (Section 7050.5) to contact the Santa Clara County Coroner. If the Coroner determines that the find is Native American, he or she must contact the NAHC. The NAHC, as required by the Public Resources Code (Section 5097.98) determines and notifies the Most Likely Descendant with a request to inspect the burial and make recommendations for treatment or disposal.

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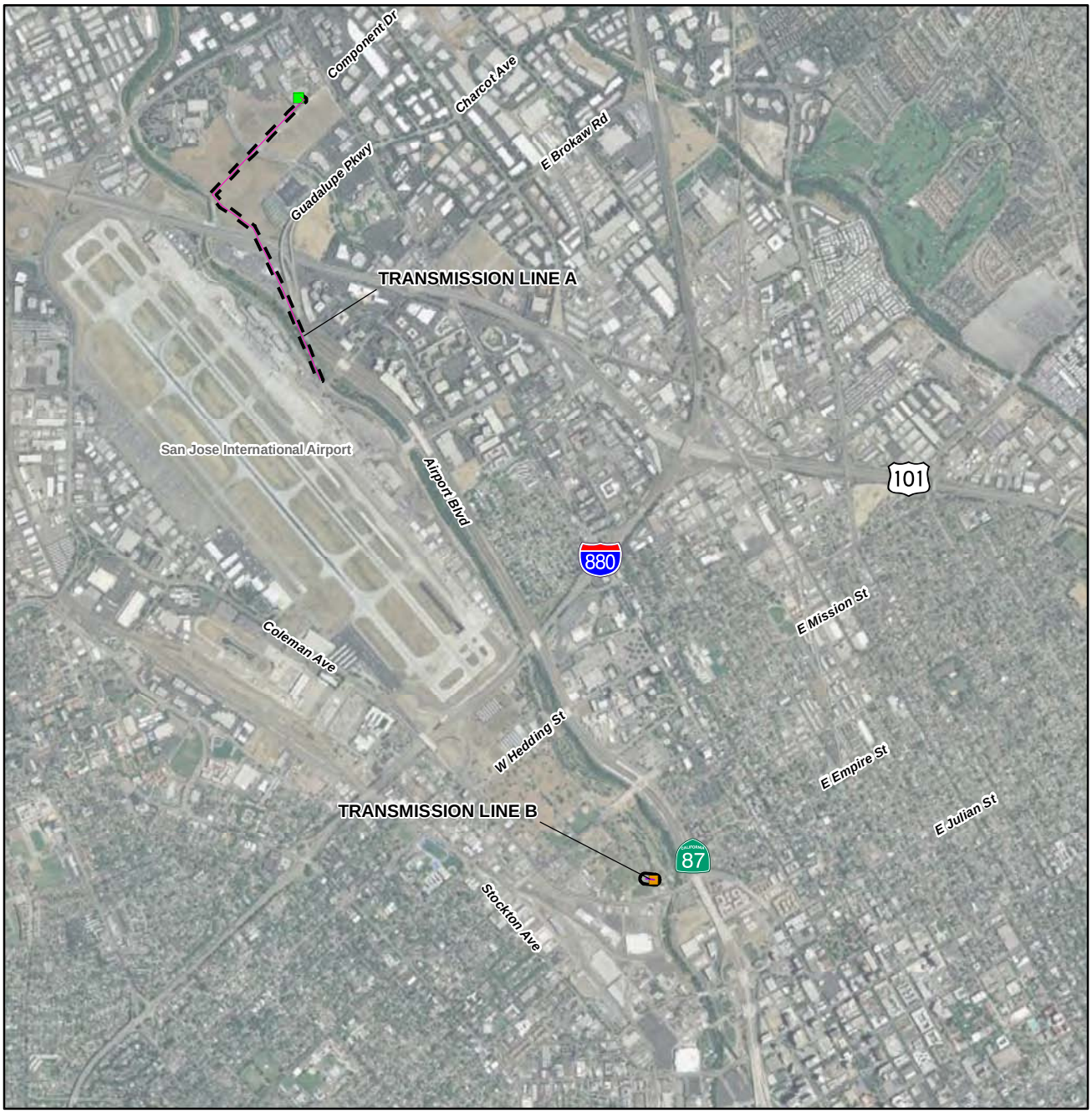
Figure 1
Cultural Survey Buffers for Reconductored Transmission Line



LEGEND

- SAN JOSE SUBSTATION
- TRIMBLE SUBSTATION
- TRANSMISSION LINE A
- TRANSMISSION LINE B
- BUFFER - 100 FEET
- BUFFER - 50 FEET

N

0 1,500 3,000
Feet

VICINITY MAP

FIGURE 1
CULTURAL SURVEY BUFFERS FOR RECONDUCTORED TRANSMISSION LINE
LOS ESTEROS CRITICAL ENERGY FACILITY AMENDMENT
SAN JOSE, SANTA CLARA COUNTY

CH2MHILL

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ATTACHMENT C

EVALUATION OF BACT FOR LECEF, PHASE 2

Evaluation of Best Available Control Technology for LECEF 2

The BAAQMD has granted an authority to construct for the conversion of the existing Los Esteros Critical Energy Facility (LECEF) from simple-cycle to combined-cycle operation. This conversion is referred to as Phase 2 and involves the addition of four heat recovery steam generators, one steam turbine generator, and one six-cell cooling tower.

LECEF currently consists of four natural gas-fired LM6000PC simple-cycle combustion turbines with a combined nominal output of 180 MW, a fire pump diesel engine, and a one-cell cooling tower. LECEF is a wholly-owned subsidiary of the Calpine Corporation.

The proposed modified LECEF facility will have a nominal output of 320 megawatts (MW) as a result of the addition of one nominal 140 MW steam turbine generator. In addition, the maximum rated heat input of each gas turbine will increase from 472.6 MM BTU/hr (HHV) to 500 MM BTU/hr (HHV).

The LECEF 2 project is required to use Best Available Control Technology (BACT) to control the emissions of various pollutants from the combustion turbines, in accordance with the requirements of the District's New Source Review program. The applicability of BACT requirements under District regulations is discussed in District Regulation 2, Rule 2. Section 206 defines Best Available Control Technology as follows:

> 2-2-206 Best Available Control Technology (BACT): For any source or modified source, except cargo carriers, the more stringent of:
>
> > 206.1 The most effective emission control device or technique which has been successfully utilized for the type of equipment comprising such a source; or
> >
> > 206.2 The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source; or
> >
> > 206.3 Any emission control device or technique determined to be technologically feasible and cost-effective by the APCO; or
> >
> > 206.4 The most effective emission control limitation for the type of equipment comprising such a source which the EPA states, prior to or during the public comment period, is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitations are not achievable. Under no circumstances shall the emission control required be less stringent than the emission control required by any applicable provision of federal, state or District laws, rules or regulations.

The District made BACT determinations for the project in 2005, and determined that the following control technologies and emission rates were considered to be BACT at that time.

Pollutant	BACT
NOx	2.0 ppmvd @ 15% O_2, 1-hour average Water injection, SCR
CO	9 ppmvd @ 15% O_2, 3-hour average Oxidation catalyst
POC	2.0 ppmvd @ 15% O_2, 3-hour average Best combustion practices, natural gas fuel
SO_2	Natural gas fuel with sulfur content <1.0 gr/100 scf
PM_{10}	Best combustion practices, natural gas fuel with sulfur content <1.0 gr/100 scf

The foregoing BACT determinations are incorporated into the Conditions of Certification issued by the State of California Energy Resources and Conversation Development Commission ("Commission") upon approving LECEF's application to move forward with the anticipated combined-cycle conversion. (Order No. 06-1011-05, adopting Commission Decision in 03-AFC-2, hereinafter "2006 Decision.") .

The District issued an Authority to Construct incorporating the relevant conditions of the Commission's 2006 Decision on August 22, 2007. This Authority to Construct is issued by the District as a ministerial act, in light of the Commission's plenary jurisdiction concerning the licensing and permitting of all power plants subject to its jurisdiction. The Authority to Construct incorporates the exact Conditions of Certification which appear within the Commission's 2006 Decision, so as to render them directly enforceable by the District. (District Reg. 2-3-405.)

Under the District's rules, where a facility has not commenced construction within two years of the date of issuance of its Authority to Construct, the District may extend the Authority to Construct for another two-year period, but only upon finding that the source continues to meet the current BACT standards and offset requirements. (District Reg. 2-1-407.1.2.) This obligation to assure that a permitted source must periodically undergo review to assure that it will meet current BACT standards implements the federal Clean Air Act's regulations for nonattainment New Source Review.

In accordance with the District's Rules, LECEF submitted a letter requesting extension of the Authority to Construct, which the District acknowledged receiving on June 8, 2009. However, the District may not, of its own volition, adopt additional or more stringent requirements than appear within the Commission's 2006 Decision. Accordingly, prior to the District's reissuance of the Authority to Construct for another two-year period, the Commission must adopt any more stringent air quality conditions necessary to assure that LECEF 2 will continue to achieve BACT upon commencement of construction.

After a series of correspondence and communications with the District to identify current BACT for LECEF 2, LECEF has prepared this updated BACT analysis to support the Commission's amendment of its 2006 Decision and the District's ministerial extension of its August 22, 2007 Authority to Construct for an additional two-year period. The emission rates and control technologies determined to be BACT for this project are discussed in detail in the following sections. Separate determinations are provided for normal operation and for startup/shutdown operation.

1. BACT for the CTG: Normal Operations

A. NOx Emissions

Achievable Controlled Levels and Available Control Options

The BAAQMD BACT guideline for combined cycle combustion turbines rated at over 40 MW indicates that achieved in practice BACT for NOx is 2.5 ppm,[1] excluding startups and shutdowns. The guidance document further indicates that 2.0 ppm is technologically feasible for an LM6000 combined cycle gas turbine based on the performance of the Valero Cogeneration Project. This level is achieved using water injection and SCR. In addition, the BAAQMD has informed the owner that the Las Vegas Cogeneration project in Clark County, Nevada, which, like LECEF, uses LM6000 gas turbines, is subject to a 2 ppm NOx limit, in conjunction with a 2 ppm limit on carbon monoxide (CO) as well (1-hr average), although the averaging period for NOx is stated as a 3–hour average. The existing NOx BACT limit for LECEF 2 is consistent with the lowest technologically feasible limit.

BAAQMD Regulation 9 Rule 9 (Stationary Gas Turbines) limits NOx emissions from these devices. Reg 9 Rule 9 specifies a NOx emission limit of 9 ppmvd @ 15% O_2 for natural gas-fired combustion gas turbines rated at over 10 MW and equipped with SCR.

The applicable NSPS (40 CFR 60 Subpart KKKK) includes a NOx limit of 42 ppmvd @ 15% O_2 for modified turbines in this size range using natural gas.

The turbine-out NOx emission rate for the water-injected LM6000 turbines is 25 ppmvd @ 15% O_2. This is a significantly higher turbine-out NOx emission rate than the 9 ppmvd rate achieved by turbines equipped with dry low-NOx (DLN) combustors. Regardless the owner will achieve the same stringent 2.0 ppm limit on its NOx emissions.

EMx is a NOx reduction system distributed by EmeraChem. This system uses a single catalyst to oxidize both NOx and CO and then a regeneration system to convert the NO_2 to N_2 and water vapor. The system does not use ammonia as a reagent. The EMx process has been demonstrated in practice on smaller and comparably-sized gas turbines, including Redding Unit 5, a 43-MW Alstom GTX100 combined-cycle gas turbine. The applicability of the EMx process to the LECEF Phase 2 project is discussed in more detail below.

The SCR system uses ammonia injection to reduce NOx emissions. SCR systems have been widely used in simple-cycle and combined-cycle gas turbine applications of all sizes, including the LM6000 and the larger F-class. The SCR process involves the injection of ammonia into the flue gas stream via an ammonia injection grid upstream of a reducing catalyst. The ammonia reacts with the NOx in the exhaust stream to form N_2 and water vapor. The catalyst does not require regeneration, but must be replaced periodically—approximately every 3 to 5 years.

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[1] All turbine exhaust emissions concentrations shown are expressed as ppmvd, corrected to 15% O2.

Either SCR or EMx technology, in combination with water injection for NOx control, are expected to achieve a NOx emission level of 2.0 ppmvd@ 15% O_2 for the combined-cycle configuration.

Environmental Impacts

The use of SCR will result in ammonia emissions due to an allowable ammonia slip limit of 10 ppmvd @ 15% O_2. While ammonia is not subject to the District's BACT standard, a health risk screening analysis was conducted to demonstrate that the permitted ammonia slip from the project (10 ppmvd @ 15% O_2) would not result in either an acute or chronic hazard index of 1. In accordance with the District's Integrated Air Toxics program and currently accepted practice, a hazard index below 1.0 is not considered significant. Therefore, the toxic impact of the ammonia slip resulting from the use of SCR is deemed to be not significant and is not a sufficient reason to eliminate SCR as a control alternative, so long as emissions are controlled as required by the current Authority to Construct (to 10 ppmvd @ 15% O_2).

The ammonia emissions resulting from the use of SCR may have another environmental impact through the potential to form secondary particulate matter such as ammonium nitrate. Because of the complex nature of the chemical reactions and dynamics involved in the formation of secondary particulates, it is difficult to estimate the amount of secondary particulate matter that will be formed from the emission of a given amount of ammonia. However, the BAAQMD has consistently stated in its planning documents that because of high background levels of ammonia, the formation of ammonium nitrate and ammonium sulfate in the San Francisco Bay Area air basin is limited by the formation of nitrates and sulfates and not driven by the amount of ammonia in the atmosphere. Therefore, ammonia emissions from the proposed SCR system are not expected to contribute significantly to the formation of secondary particulate matter within the BAAQMD.

A second potential environmental impact that may result from the use of SCR involves the storage and transport of aqueous ammonia. Although ammonia is toxic if swallowed or inhaled and can irritate or burn the skin, eyes, nose, or throat, it is a commonly used material that is typically handled safely and without incident and is already being used at LECEF, as well as at numerous power plants and other industrial facilities throughout the state. The CEQA document prepared for the proposed project demonstrated that impacts arising from a catastrophic release of ammonia due to spontaneous storage tank failure at the facility would not be significant. Thus, the potential environmental impact due to aqueous ammonia use at the LECEF 2 does not justify the elimination of SCR as a control alternative.

EMx has been demonstrated in service in five applications: the Sunlaw Federal cogeneration plant, the Wyeth BioPharma cogeneration facility, the Montefiore Medical Center cogeneration, the University of California San Diego facility, and the Redding Power Plant (REU). The largest installation of the EMx system is at the Redding Power Plant. The Redding Power Plant currently consists of a single combined cycle 43 MWe Alstom GTX100 combustion turbine with a permitted NOx emission rate of 2.5 ppm. There is a second 43 MWe unit under construction at the Redding Power Plant, but that unit has not begun operation.

A review of NOx continuous emissions monitoring (CEM) data obtained from the EPA's Acid Rain program website[2] indicates a mean NOx level for the unit of less than 1.0 ppm during the period from 2002 to 2007. After the first year of operation, Unit #5 at the REU power plant has experienced only a few hours of non-compliance per year (fewer than 0.1% of the annual operating hours exceed the NOx permit limit of 2.5 ppm). At the lower NOx limit of 2.0 ppm that will be required for the proposed combined cycle conversion project, the CEM data show that the number of non-compliant hours increases to approximately 0.2% of the annual operating hours. The experience at the City of Redding Plant indicates the ability of the EMx system to control NOx emissions to levels of 2.0 ppm and less.

Based on this information, the following paragraphs evaluate performance criteria as applied to the achievement of extremely low NOx levels (2.0 ppm) using EMx technology.

- Commercial availability: While a proposal has not been sought, presumably EmeraChem Power would offer standard commercial guarantees for the proposed LECEF2 project. Consequently, this criterion is expected to be satisfied.
- Reliability: As discussed above, based on a review of the CEM data for REU Unit #5 the EMx system complied with the 2.5 ppm NOx permit limit but with a few hours each year of excess emissions (approximately 3% of annual operating hours following the first year, and approximately 2% following the second year, dropping to approximately 0.1% after 4 years). This level of performance was also associated with some significant operating and reliability issues. According to a June 23, 2005 letter from the Shasta County Air Quality Management District[3], repairs to the EMx system began shortly after initial startup and have continued during several years of operation. Redesign of the EMx system was required due to a problem with the reformer reactor combustion production unit that led to sulfur poisoning of the catalyst. In addition, the EMx system catalyst washings had to occur at a frequency several times higher than anticipated during the first three years of operation, which has resulted in substantial downtime of the combustion turbine. Since the REU installation is the most representative of all of the EMx-equipped combustion turbine facilities for comparison to the proposed LECEF 2 project, the problems encountered at REU bring into question the reliability of the EMx system for the proposed project.
- Effectiveness: The EMx system at the REU power plant has recently demonstrated that a 2.0 ppm emissions limit is achievable, with limited periods of excursions. However, there are no long-term performance data for the EMx system on combustion turbine projects in the size range of the LECEF 2 CTGs.

Conclusion

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[2] Available at http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=prepackaged.results

[3] Letter dated June 23, 2005, from Shasta County Air Quality Management District to the Redding Electric Utility regarding Unit 5 demonstration of compliance with its NOx permit limit.

Because both SCR and EMx are expected to achieve the proposed BACT NO_x emission limit of 2.0 ppmvd @ 15% O_2 averaged over one hour and neither will cause significant energy, economic, or environmental impacts, neither can be eliminated as viable control alternatives. The concern remains regarding the long-term effectiveness of EMx as a control technology. Further, although the owner intends to replace the HRSGs, there has already been a large investment in ammonia delivery and storage infrastructure at LECEF. For these reasons, and because SCR is already in use at the facility, SCR has been selected as the NOx control technology to be used for LECEF 2.

Conclusions

BACT must be at least as stringent as the most stringent level achieved in practice, federal NSPS, or district prohibitory rule. Based upon the results of this analysis, the NOx BACT determination of 2.0 ppm @ 15% O_2 on a 1-hour average basis made for the project in 2005 and achieved in practice at the Valero facility reflects the most stringent achievable NOx emission limit. The LECEF 2 facility will be designed to meet a NOx level of 2.0 ppmv @ 15% O_2 on a 1-hour average basis using SCR.

B. POC Emissions

Achievable Controlled Levels and Available Control Options

Most POC emissions from natural gas-fired turbines are the result of incomplete combustion of fuel. Therefore, most of the organic compound emissions from natural gas combustion are methane and ethane, which are not effectively controlled by an oxidation catalyst but are also not defined as POC by the BAAQMD because these compounds have been determined not to contribute to the formation of ozone. However, oxidation catalyst technology designed to control CO can also provide some degree of control of POC emissions, especially the more complex compounds and toxic compounds formed in the combustion process. Therefore, use of an oxidation catalyst is generally considered BACT for POC.

The BAAQMD's BACT guidelines specify that, for natural gas-fired combined-cycle combustion gas turbines larger than 40 MW, a VOC limit of 2 ppmvd @ 15% O_2 has been "achieved in practice."

CARB's BACT guidance document for combined-cycle power plant units rated at between 12 and 50 MW[4] indicates that BACT for the control of VOC emissions is 2 ppmvd @ 15% O_2.

Published prohibitory rules from the BAAQMD, SMAQMD, SDCAPCD, SJVAPCD, and SCAQMD were reviewed to identify the POC standards that govern existing natural gas-fired simple cycle combustion gas turbines. None of the prohibitory rules for combustion gas turbines specify an emission limit for POC. The applicable NSPS (40 CFR 60 Subpart KKKK) does not include a POC limit.

The District has informed LECEF that, based upon applications it has received for new combined-cycle facilities and a proposed Prevention of Significant Deterioration (PSD) permit the District recently issued, the District believes that 1 ppmvd @ 15% O_2 (1-hr

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4 Carb, "Guidance For The Permitting of Electrical Generation Technologies," July 2002, Table I-1.

average) constitutes BACT for POC for the source category. LECEF believes that 1 ppm (1-hr average) is an achievable limit for POC for the combined-cycle conversion.

Conclusions

BACT must be at least as stringent as the most stringent achieved in practice limit, federal NSPS, or district prohibitory rule requirement, or considered technologically feasible. Based upon the results of this analysis, the POC emission limit of 1.0 ppmv @ 15% O_2 constitutes current BACT for the proposed project.

C. $PM_{10}/PM_{2.5}$ Emissions

Achievable Controlled Levels and Available Control Options

PM emissions from natural gas-fired turbines primarily result from carryover of noncombustible trace constituents in the fuel. PM emissions are minimized by using clean burning pipeline quality natural gas with low sulfur content. The existing simple-cycle gas turbines at LECEF have a permitted PM_{10} emission limit of 2.5 lb/hr. The revised PDOC prepared for the project in 2005 determined that, "The PM10 emission factor of 2.5 lb/hr is based upon source testing results for the existing gas turbines at LECEF under simple-cycle operation. The duct burners that will be added for combined-cycle operation will not contribute significantly to the PM10 emissions from the gas turbines."

The CARB BACT Clearinghouse, as well as the BAAQMD and SJVAPCD BACT guidelines, identifies the use of natural gas as the primary fuel as "achieved in practice" for the control of PM_{10} for combustion gas turbines. The SJVAPCD also requires the use of an air inlet filter and a lube oil vent coalescer to remove ambient particulate matter from the inlet air and to minimize the formation of lube oil mists, respectively. These BACT guidelines do not establish any emission limit as BACT for PM_{10}.

CARB's BACT guidance document for medium-sized stationary gas turbines used for combined-cycle power plants[5] indicates that BACT for the control of PM emissions is an emission limit corresponding to natural gas with fuel sulfur content of no more than 1 grain/100 standard cubic feet. This guidance document does not establish any emission limit as BACT for PM_{10}.

Title 40 CFR Part 60 Subpart KKKK contains the applicable NSPS for these combustion gas turbines. Subpart KKKK does not regulate PM_{10} emissions.

Published prohibitory rules from the BAAQMD, SCAQMD, SJVAPCD, SMAQMD, and SDCAPCD were reviewed to identify the PM_{10} standards that govern natural gas-fired combustion gas turbines. These prohibitory rules do not regulate PM_{10} emissions.

Conclusions

Based upon the results of this analysis, the limit of 2.5 lb/hr originally proposed for the project still represents the most stringent PM_{10} emission limit. The District established a requirement for the use of natural gas as the primary fuel to control PM_{10} emissions from combustion gas turbines. Therefore, the use of natural gas as the primary fuel source constitutes BACT for PM_{10} emissions from combustion gas turbines. Through the use of

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[5] Ibid.

natural gas, the turbines are expected to be able to meet the proposed emission limit of 2.5 lb/hr.

D. CO Emissions

Achievable Controlled Levels and Available Control Options

Oxidation catalyst technology is commonly used to control CO emissions.

The CARB's BACT guidance document for electric generating units rated at between 12 and 50 MW[6] indicates that BACT for the control of CO emissions from stationary gas turbines used for combined-cycle and cogeneration power plants is 6 ppmvd @ 15% O_2.

The BAAQMD's BACT guidelines specify that, for natural gas-fired combined-cycle gas turbines larger than 40 MW, a CO limit of 4 ppmv @ 15% O2 has been "achieved in practice." This is based on data collected at the Valero Cogeneration facility, and the 4 ppm CO limit is achieved in practice by LM6000 gas turbines in combined cycle operation.

The BAAQMD has informed the applicant that an LM6000 cogeneration facility located in Clark County, Nevada (Las Vegas Cogen) is subject to a CO limit of 2 ppmv@ 15% O2, 1-hour average, along with a NOx limit of 2 ppm @ 15% O_2 (3- hour average).

As discussed above, the existing Authority to Construct for LECEF 2 (*i.e.*, the conversion of LECEF from a simple-cycle to combined-cycle facility) requires a reduction in NOx emissions to 2.0 ppm from the currently permitted emission rate of 5.0 ppm for simple-cycle operations. When LECEF 2 was originally permitted, the operator provided test data demonstrating the effect of the increase in the water injection rate that would be required to allow the turbines to comply with a 2.0 ppm NOx limit. As the NOx emission concentration after abatement by the SCR system decreased from 4.1 ppmv to 2.7 ppmv, the CO emissions after abatement by the oxidation catalyst increased from 1.7 ppmv to 5.2 ppmv. It was expected that the CO emissions would increase further as the NOx emissions are controlled to meet a 2.0 ppmv limit on NOx. Based on the demonstrated increases in CO emissions that occurred as the water injection rates were increased to reduce NOx emissions, the applicant requested that the maximum allowable (not-to-be-exceeded) CO limit be increased to 9.0 ppmv. The District agreed that the proposed CO limit of 9.0 ppm was reasonable when combined with the 2.0 ppm NOx limit.

Recently, however, the owner replaced all of the SCR catalysts due to aging, and the current design calls for the HRSGs to be replaced as well. The owner also expects to install new oxidation catalysts as part of the combined cycle conversion. In light of these changes, the owner now believes that a CO limit of 2 ppm, 1-hour average, is achievable for the proposed project.

E. SOx Emissions

Achievable Controlled Levels and Available Control Options

The CARB BACT Clearinghouse, as well as the BAAQMD and SJVAPCD BACT guidelines, identifies the use of PUC-quality natural gas or natural gas with a limit on

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[6] Ibid.

the sulfur content (i.e., 1 grain/100 scf) as the primary fuel as "achieved in practice" for the control of SOx for combustion gas turbines. The two most recent BACT determinations in the SCAQMD did not indicate BACT for SOx.

Title 40 CFR Part 60 Subpart KKKK contains the applicable NSPS for combustion gas turbines. This regulation limits SOx emissions to 0.56 lb/MWh, well above the limits for natural gas-fired turbines in the District guidelines.

Published prohibitory rules from the BAAQMD, SJVAPCD, and SCAQMD were reviewed to identify the SO_2 standards that govern existing gas turbines.

- BAAQMD Rule 9-9 (Nitrogen Oxides from Stationary Gas Turbines) is the BAAQMD's only prohibitory rule that specifically addresses gas turbines but does not limit SO_2 emissions. The BAAQMD adopted Rule 9-1 (Sulfur Dioxide) to limit SO_2 emissions from all sources. Rule 9-1 prohibits SO_2 emissions in excess of 300 ppm. No other BAAQMD Rule or Regulation contains a relevant prohibitory rule regulating either the sulfur content in the fuel or the emission of SO_2 from gas turbines.
- SJVAPCD Rule 4703 (Stationary Gas Turbines) is the SJVAPCD's only prohibitory rule that specifically addresses gas turbines but does not limit SO_2 emissions. The SJVAPCD adopted Rule 4301 (Fuel Burning Equipment) to limit SO_2 emissions from these devices. Rule 4301 specifies a SO_2 emission limit of 200 pounds per hour. The SJVAPCD also adopted Rule 4801 (Sulfur Compounds) to limit emissions of sulfur compounds. Rule 4801 specifies a SO_2 emission limit of 0.2%, or 2,000 ppm.
- SCAQMD Rule 1134 (Emissions of Oxides of Nitrogen from Stationary Gas Turbines) is the SCAQMD's only prohibitory rule that specifically addresses gas turbines; however, it does not limit SO_2 emissions. The SCAQMD adopted Rule 431.1 (Sulfur Content of Gaseous Fuels) to reduce SOx emissions from the burning of gaseous fuels in stationary equipment. Rule 431.1 specifies a sulfur limit of 16 grains/100 scf (as H_2S) in natural gas sold within the SCAQMD. The SCAQMD also adopted Rule 407 (Liquid and Gaseous Air Contaminants) to limit SO_2 emissions from all sources. Rule 407 specifies an emission limit of 2,000 ppm for sulfur compounds (calculated as SO_2).

Conclusions

BACT must be at least as stringent as the most stringent limit achieved in practice, federal NSPS, or district prohibitory rule. Based upon the results of this analysis, the CARB database and BAAQMD and SJVAPCD BACT guidelines reflect the most stringent SOx emission limit. These sources established a requirement for the use of natural gas as the primary fuel to control SOx emissions from combustion gas turbines. Therefore, the use of natural gas as the primary fuel source constitutes BACT for SOx emissions from the gas turbines.

F. Summary of Current BACT

Based on the analysis above, the following emission limits and control techniques are proposed as current BACT for the combined-cycle conversion project:

Pollutant	BACT
NOx	2.0 ppmvd @ 15% O_2, 1-hour average Water injection, SCR
CO	2ppmvd @ 15% O_2, 1-hour average Oxidation catalyst
POC	1.0 ppmvd @ 15% O_2, 1-hour average Best combustion practices, natural gas fuel
SO_2	Natural gas fuel with sulfur content <1.0 gr/100 scf
PM_{10}	2.5 lb/hr Best combustion practices, natural gas fuel with sulfur content <1.0 gr/100 scf

2. BACT for the CTGs: Startup/Shutdown

Startup and shutdown periods are a normal part of the operation of combined-cycle power plants such as LECEF 2. BACT must also be applied during the startup and shutdown periods of gas turbine operation. The BACT limits discussed in the previous section generally apply to steady-state operation, when the turbines have reached stable operations and the emission control systems are fully operational.

During gas turbine startup, there are equipment and process requirements that must be met in sequential order to protect the equipment. Some of these require holding the gas turbine at low loads, where operation is inefficient and emissions are relatively high, to allow downstream components (the HRSG and steam turbine) to reach their operating temperatures. The post-combustion controls that are used to achieve additional emissions reductions (SCR and oxidation catalyst) require specific exhaust temperature ranges to be fully effective. The use of SCR to control NOx is not technically feasible when the surface of the SCR catalyst is below the manufacturer's recommended operating range. When surface temperatures are low, ammonia will not react completely with the NOx, resulting in excess NOx emissions or excess ammonia slip. In addition, ammonia injection cannot be initiated until the ammonia vaporization system has reached its required operating temperature. The oxidation catalyst is not effective at controlling CO emissions when exhaust temperature is outside the optimal temperature range. Therefore, the BACT determinations for NOx, CO, and VOC during normal, steady-state operation are not applicable during startup and shutdown. However, since SO_2 and PM_{10} emissions result from the characteristics of the fuel burned and do not rely on any emissions control system, the BACT determinations for SO_2 and PM_{10} emissions are applicable during startup and shutdown as well.

Because NOx, CO, and VOC emissions during startup and shutdown are not effectively reduced by combustion controls or add-on control devices, the emission rates themselves cannot be effectively reduced. Since the emission rates cannot be reduced, emissions during startup periods and shutdown events must be addressed by minimizing the amount of time the gas turbines spend in startup or shutdown. The permit currently limits startup to 240 minutes, defined as the period beginning with initiation of fuel flow to the turbine and ending when the turbine meets the concentration- and mass-emissions limitations for normal, steady-state operation. It also limits any shutdown, defined to begin with the initiation of the turbine shutdown sequence and to end with cessation of turbine firing, to 30 minutes per event. In

addition, all emissions during startups and shutdowns will accrue toward the daily and annual emissions limits, which were derived (as described in the revised Preliminary Determination of Compliance) based upon assumptions about the number of startup/shutdown events that would occur in a calendar day or year and the emissions during startup and shutdown events, estimated from source test data for the existing facility. As a consequence, the daily and annual limits imposed upon the facility effectively limit startup and shutdown emissions.

Finally, there are basic principles of operation, or Best Management Practices, that minimize emissions during startups and shutdowns. These Best Management Practices are as follows:

- During a startup, bring the gas turbine to the minimum load necessary to achieve compliance with the applicable NOx and CO emission limits as quickly as possible, consistent with the equipment manufacturers' recommendations and safe operating practices;
- During a startup, initiate ammonia injection to the SCR system as soon as the SCR catalyst temperature and ammonia vaporization system have reached their minimum operating temperatures;
- During a shutdown, once the turbine reaches a load that is below the minimum load necessary to maintain compliance with the applicable NOx and CO emission limits, reduce the gas turbine load to zero as quickly as possible, consistent with the equipment manufacturers' recommendations and safe operating practices; and
- During a shutdown, maintain ammonia injection to the SCR system as long as the SCR catalyst temperature and ammonia vaporization system remain above their minimum operating temperatures.

The owner believes that the pound per day NOx, CO and VOC emission limits that will apply during startup, the 240-minute limit for startup periods, the 30-minute limit for shutdown and the proposed use of Best Management Practices constitute BACT for startups and shutdowns for this type of turbine configuration.