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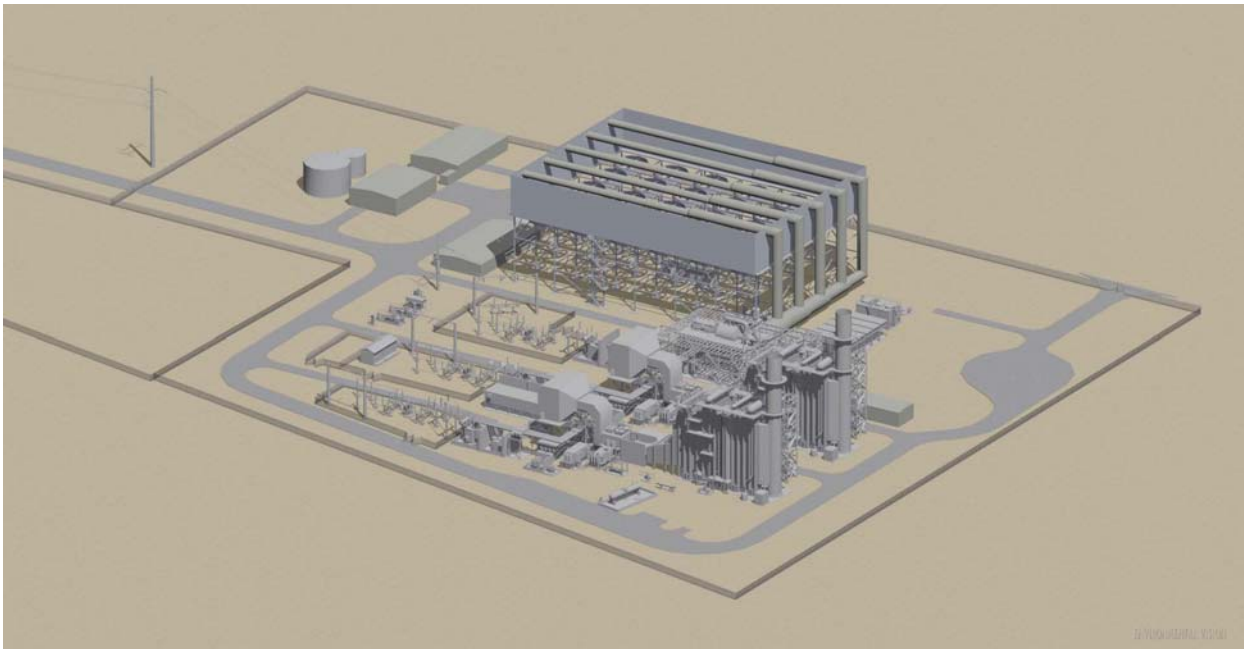
OAKLEY GENERATING STATION

Preliminary Staff Assessment - Part B



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OAKLEY GENERATING STATION
(09-AFC-4)
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EXECUTIVE SUMMARY

Pierre Martinez, AICP

INTRODUCTION

Contra Costa County Generating Station, LLC (CCCGS, LLC) is a limited liability corporation, wholly owned by Radback Energy, Inc. CCCGS, LLC is the proponent of the Oakley Generating Station (OGS), formerly the Contra Costa County Generating Station, and filed an Application for Certification (AFC) with the California Energy Commission (Energy Commission) on June 30, 2009, to construct and operate a natural gas-fired combined cycle electrical generating facility with a gross nominal generating capacity of 624-megawatts (MW). The AFC was reviewed for data adequacy on August 12, 2009, wherein the Energy Commission found the AFC inadequate and adopted a list of deficiencies in five technical areas. Between August 20 and September 9, 2009, the applicant provided additional information to supplement the AFC. At a business meeting held on September 23, 2009, the Energy Commission adopted the Executive Director's data adequacy recommendation, thereby deeming the AFC complete for filing purposes.

On November 9, 2009, an Informational Hearing and Public Site Visit was held in the City of Oakley to facilitate public involvement and agency participation in the certification process.

Staff data requests were issued on January 19, February 17, and March 22, 2010 and a Data Request Workshop was held on April 23, 2010. Since the Data Requests were issued, the applicant has submitted numerous Data Responses to address items raised by staff to ensure that a thorough review and analysis of the project could be conducted.

This Preliminary Staff Assessment (PSA) contains the California Energy Commission staff's independent evaluation of the proposed Oakley Generating Station (OGS) project, Application for Certification (09-AFC-4). The PSA is being published in two parts. PSA Part A was published on December 20, 20010, while this PSA Part B contains analysis of those sections not included in PSA Part A. Generally, the PSA examines engineering, environmental, public health and safety aspects of the OGS project, based on the information provided by the applicant (CCGS, LLC) and other sources available at the time the PSA was prepared. Because the PSA is being published in two parts, not all sections typical of a PSA are being published at this time. This PSA Part B contains staff's environmental and engineering evaluation of the OGS project in the following technical sections: **Alternatives, Air Quality, Biological Resources, Land Use, Socioeconomic Resources, Soil and Water Resources, Traffic and Transportation, and Transmission System Engineering**.

PSA Part A contained staff's environmental, and engineering evaluation of the OGS project for the balance of remaining technical sections: **Cultural Resources, Noise and Vibration, Public Health, Transmission Line Safety and Nuisance, Visual Resources, Waste Management, Worker Safety, Facility Design, Geology and Paleontology, Power Plant Efficiency,** and **Power Plant Design**. In addition to the technical areas noted in PSA Part A, PSA Part A included the following sections that are

not included in PSA Part B: Introduction, Project Description, and General Conditions. The PSA contains analyses similar to those normally contained in an Environmental Impact Report (EIR) required by the California Environmental Quality Act (CEQA). When issuing a license, the Energy Commission is the lead agency under CEQA, and its regulatory process, which has been certified by the Secretary of the Natural Resources Agency, is functionally equivalent to the preparation of an EIR.

The Energy Commission staff has the responsibility to complete an independent assessment of the project's engineering design and its potential effects on the environment, the public's health and safety, and whether the project conforms to all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse environmental effects and proposes conditions of certification for construction, operation and eventual closure of the project, if approved by the Energy Commission.

This PSA is not the decision document for these proceedings nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local, state, and federal legal requirements. The PSA will be superseded by staff's Final Staff Assessment (FSA), which will serve as staff's official sworn testimony in evidentiary hearings to be held by an assigned Committee of two Energy Commissioners and a Hearing Officer. After evidentiary hearings, the Committee will consider the testimony presented by staff, the applicant, and all parties to the proceeding as well as recommendations and comments provided by government agencies and the public prior to issuing a Presiding Member's Proposed Decision (PMPD). Following a 30-day public review, the full five-member Energy Commission will render its final decision.

PROJECT LOCATION AND DESCRIPTION

The proposed project site is located in the city of Oakley, eastern Contra Costa County, at 6000 Bridgehead Road, northeast of the junction of State Route 4 and State Route 160. This site is at the western city limits of Oakley and adjacent to the eastern city limits of Antioch. The project is located on a 21.95-acre site that is part of a larger 210-acre property owned by E.I. du Pont de Nemours and Company (DuPont).

The project is bounded to the west by the Pacific Gas and Electric (PG&E) Antioch Terminal, a large natural gas transmission hub, to the north by DuPont property that is either industrial or vacant industrial, to the east by DuPont's titanium dioxide landfill area, and to the south by the Atchison, Topeka and Santa Fe railroad.

The majority of the project site is used as a vineyard as this portion of the DuPont property was never developed for industrial purposes. A small wetland area is located at the northwestern corner of the site.

The OGS project will be a natural gas-fired, combined-cycle facility with a nominal generating capacity of 624-megawatts (MW). The facility will be capable of operating 24 hours per day, 7 days per week. It will be designed as a base-load facility with the added capabilities of rapid startup, high turndown capability (i.e. ability to turn down to a

low load), and high ramp rates. Because the combined-cycle configuration will be more efficient than other aging gas-fired steam generation facilities in northern California, the OGS facility is anticipated to be frequently dispatched and operate up to approximately 8,463 hours per year (approximately 96.6% capacity with the balance in downtime for maintenance), yet with an expected facility capacity factor at 60 to 80%. The applicant has entered into a Purchase and Sale agreement with PG&E to guarantee commercial availability of power by June 1, 2016.

Primary equipment for the generating facility will include:

- Two General Electric (GE) Frame 7FA combustion turbine generators (CTGs)
- One single condensing GE D11 steam turbine generator
- Two unfired heat recovery steam generators (HRSGs)
- One auxiliary boiler
- One air-cooled condenser (dry-cooled technology)
- One evaporative fluid cooler
- One diesel powered fire pump, and other associated equipment.

Power will be transmitted to the regional electrical grid through a 230-kV connection to PG&E's Contra Costa Substation, located 2.4-miles to the southwest of the OGS. The project will replace the existing 60-kV line, located within an existing 80-foot-wide PG&E easement, with a 230-kV line.

Construction laydown and parking areas will be located on a 20-acre parcel east of the plant site on DuPont property.

AGENCY COORDINATION

Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). However, the Energy Commission seeks comments from and works closely with other regulatory agencies that administer LORS applicable to the proposed project. These agencies may include as applicable the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, State Water Resources Control Board/Regional Water Quality Control Board, California Department of Fish and Game, the California Air Resources Board, the Bay Area Air Quality Management District, the California Independent System Operator, and the City of Oakley. On August 5, 2009, Energy Commission staff sent the OGS AFC to all local, state, and federal agencies that might be affected by the proposed project.

CITY OF OAKLEY

On November 25, 2009, Energy Commission staff sent a letter to the City of Oakley (City) Community Development Department requesting that the City provide conditional use permit (CUP) findings it would make for the OGS, and the conditions that they would attach to the proposed project, were they the permitting agency if not for the exclusive siting authority of the Energy Commission. On April 5, 2010, the City responded to this request with a list of CUP findings and a list of 75 recommended conditions of approval.

In response to the City's list of recommended conditions of approval, staff has prepared a summary table (Appendix A to this PSA Part B) which summarizes staff's response to each condition. Briefly, the table restates the exact wording of each recommended condition, the section in the PSA where that particular recommended condition is addressed, and a specific reference to a Condition of Certification or discussion, if applicable. This table only includes responses for sections included in this PSA Part B. A similar table was included in the PSA Part A that addressed the remaining recommended conditions related to the sections included in the PSA Part A.

OUTREACH EFFORTS

Energy Commission regulations require staff to send notices regarding receipt of an AFC and Commission events and reports related to proposed projects, at a minimum, to property owners within 1,000 feet of a project and 500 feet of a linear facility (such as transmission lines, gas lines and water lines) and publish a notice in a local newspaper. The Energy Commission's outreach efforts are an ongoing process that, to date, have involved the following efforts; on August 5, 2009, a notice of receipt of the project AFC was mailed out. Notice of the November 9, 2009 Informational Hearing and Site Visit to the proposed site of the OGS was sent by letter on October 8, 2009. In addition to property owners and persons on the general project mail-out list, notification was provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project.

LIBRARIES

On August 5, 2009, the Energy Commission staff provided the (OGS) Application for Certification to various libraries within the project vicinity including; Antioch Library, Pittsburg Library, and Oakley/Freedom High Library. In addition to these local libraries, copies of the AFC were made available at the Energy Commission's Library in Sacramento, the California State Library in Sacramento, as well as public libraries in Eureka, Fresno, Los Angeles, San Diego, and San Francisco.

DATA RESPONSE AND ISSUE RESOLUTION WORKSHOP

Energy Commission staff sent a public notice to appropriate parties on March 30, 2010 for an April 23, 2010 Data Response and Issue Resolution Workshop. In addition to property owners and persons on the general project mail-out list, notification was provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project.

NOTIFICATION TO THE LOCAL NATIVE AMERICAN COMMUNITY

Notice was sent to the Ohlone Indian Tribe and the Native American Heritage Commission (NAHC) advising them of submittal of the project AFC and providing them with information on the process and how they may participate. On June 23, 2010, Energy Commission staff also contacted the (NAHC) requesting a current list of Native American representatives with traditional ties to Contra Costa County, who have expressed interest in receiving information regarding development projects in the project area.

PUBLIC ADVISORS OFFICE

The Public Advisor helps the public participate in the Energy Commission hearings and meetings. The Public Advisor assists the public by advising them of how they can participate in the Energy Commission process; however, they do not represent members of the public.

Prior to the November 9, 2009 Informational Hearing and Public Site Visit, the Public Advisor (PAO) sent a cover letter and two-sided bilingual notice in English and Spanish announcing the Informational Hearing and Public Site Visit and requested posting of the notice to increase outreach. It was also sent to local Antioch, Bethel Island, Brentwood, Oakley, and Pittsburgh elected officials, commissions, and boards; local native American Tribes and registered members (provided by the Native American Heritage Commission); public and private schools; places of worship and many others.

Additionally, the PAO advertised in local newspapers including the *Contra Costa Times* (English) and *Fronteras* (Spanish) that ran on November 7, 2009. The PAO's office also requested Public Service Announcements of local Chambers of Commerce for the cities of Antioch, Pittsburgh, and Bethel Island and the City of Oakley. The bilingual notice was sent to local television and radio stations.

ENVIRONMENTAL JUSTICE

The steps recommended by the U.S. EPA's guidance documents to assure compliance with the Executive Order 12898 regarding environmental justice are: (1) outreach and involvement; (2) a screening-level analysis to determine the existence of a minority or low-income population; and (3) if warranted, a detailed examination of the distribution of impacts on segments of the population. Though the Federal Executive Order and guidance are not binding on the Energy Commission, staff finds these recommendations helpful for implementing this environmental justice analysis.

In considering environmental justice in energy facility siting cases, staff uses a demographic screening analysis to determine whether low-income and/or minority population exists within the potentially affected area of the proposed site. The demographic screening is based on information contained in two documents: "Environmental Justice: Guidance Under the National Environmental Policy Act" (Council on Environmental Quality, December 1997) and "Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses" (U.S. Environmental Protection Agency, April 1998).

The Environmental Justice screening process relies on Year 2000 U.S. Census data to determine the presence of minority and below-poverty-level populations. Environmental Justice: Guidance Under the National Environmental Policy Act, defines minority individuals as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population is identified when the minority population or the below-poverty-level population of the potentially affected area is:

1. greater than 50%; or

2. present in one or more US Census blocks where a minority population of greater than 50% exists.

In addition to the demographic screening analysis, staff follows the steps recommended by the U.S. EPA's guidance documents in regard to outreach and involvement; and if warranted, a detailed examination of the distribution impacts on segments of the population.

Staff has followed each of the above steps for the following eleven (11) sections in the PSA, of which those sections underlined are included in this PSA Part B: **Air Quality, Hazardous Materials, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soils and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources,** and **Waste Management**. Over the course of the analysis for each of these technical disciplines, staff considered potential impacts and mitigation measures, and whether there would be a significant impact on an environmental justice population. Staff determined that the remaining technical areas did not involve potential environmental impacts that could contribute to a disproportionate impact on an environmental justice population, and so did not necessitate further environmental justice analysis for those areas.

DETERMINING MINORITY POPULATION

Socioeconomic Figure 1 (located in the Socioeconomics section of this PSA Part B publication) shows the minority population within a six-mile radius of the proposed OGS site. As discussed above, a minority population is identified when the minority population of the potentially affected area is greater than 50% or meaningfully greater than the percentage of the minority population in the general population or other appropriate unit of geographical analysis. For the OGS project, the 2000 U.S. Census total population within the six-mile radius of the proposed site is 138,443 persons, with a minority population of 57,477 persons, or about 42% of the total population.

DETERMINING BELOW-POVERTY-LEVEL POPULATION

Below-poverty-level populations are identified based on Year 2000 census block group data. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old. The below-poverty-level population within a six mile radius of the OGS project is 10,145 people, or about 7.85% of the population of the area.

SIGNIFICANT IMPACTS

Staff has determined that for the above-mentioned sections of the PSA Part B, with the exception of air quality and biological resources, there is a reasonable likelihood that significant impacts can be mitigated through the Conditions of Certification thereby ensuring that there would be no disproportionate or significant impact on a environmental justice population.

Staff has identified mitigation measures designed to reduce, to the greatest extent possible, any impact that will occur in the community surrounding the proposed project. Staff's environmental justice outreach has been incorporated into its overall outreach activity, including the preparation of a status report prepared by the Public Advisor's Office on November 5, 2009 in association with preparation for the November 9, 2009 Informational Hearing and Site Visit. One of the purposes of the status report was to provide early outreach to ensure that the Energy Commission is inclusive and responsive to people of all races, cultures and incomes with respect to meaningful public participation in Energy Commission proceedings

STAFF'S ASSESSMENT OF THE PROPOSED PROJECT IMPACTS

Each technical area section of the PSA contains a discussion of the project setting, impacts, and where appropriate, mitigation measures and proposed conditions of certification. The PSA includes staff's preliminary assessment of:

- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- direct, indirect, and cumulative environmental impacts, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;
- project closure;
- project alternatives;
- compliance of the project with all applicable laws, ordinances, regulations and standards (LORS) during construction and operation;
- environmental justice for minority and low income populations;
- conclusions and recommendations; and
- proposed conditions of certification.

SUMMARY OF PROJECT RELATED IMPACTS

Staff believes the project, as currently proposed, including the applicant's and the staff's proposed mitigation measures and the staff's proposed conditions of certification, would comply with all applicable laws, ordinances, regulations, and standards (LORS) for

those sections included in this PSA Part B, except for Air Quality and Biological Resources, where a determination cannot be made at this time. For a more detailed review of potential impacts, see staff's technical analyses in this PSA Part B. The status of each technical area is summarized in the table below.

Technical Area	Complies with LORS	Impacts Mitigated
Air Quality	Undetermined	Undetermined
Biological Resources	Undetermined	Undetermined
Land Use	Yes	Yes
Socioeconomic Resources	Yes	Yes
Traffic and Transportation	Yes	Yes
Transmission System Engineering	Yes	Yes
Public Health	Yes	Yes
Reliability	Yes	Yes
Transmission Line Safety and Nuisance	Yes	Yes
Visual Resources	Yes	Yes
Waste Management	Yes	Yes
Worker Safety and Fire Protection	Yes	Yes

Air Quality – Staff is not able to determine whether the proposed OGS project would conform with all federal, state, and Bay Area Air Quality Management District (BAAQMD) LORS or whether or not it would result in significant air quality-related impacts at this time as the applicant has not demonstrated that they control sufficient emissions reductions to allow staff to reach this conclusion. The OGS project applicant has proposed a palette of mitigation options for addressing anticipated air quality impacts; however, the mitigation options must be more specific and must be shown to be feasible for staff to reach a final determination. The applicant is aware of the deficiencies in information and anticipates providing additional information to resolve this issue before the Final Determination of Compliance (FDOC) would be issued by the BAAQMD. Any new information made available by the applicant or by the BAAQMD in the FDOC will be incorporated into the Final Staff Assessment (FSA).

Biological Resources – Staff is not able to determine whether the OGS project would conform with all federal, state, and local LORS or whether or not it would result in significant impacts to biological resources as there is outstanding information from the applicant regarding removal of trees and outstanding feedback anticipated from the East Contra Costa County Habitat Conservancy (Conservancy) on the applicant's submittal of a Planning Survey Report (PSR).

Additional detailed discussion is provided in the **Biological Resources**, section; however, by way of background, the OGS project will remove protected trees that will need to be mitigated per local jurisdictional requirements. A tree survey will allow staff to identify which trees will be impacted and the appropriate mitigation. With respect to potential impacts on endangered species, the OGS project is within the plan area of the East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (ECCC HCP/NCCP) area. The ECCC HCP/NCCP provides for a

coordinated and regional permitting approach to conservation and regulation of endangered species with development fees and other mitigation measures identified to ensure that impacts to any endangered species from new development are adequately mitigated. Participation in the ECCC HCP/NCCP provides take authorization under the federal Endangered Species Act and Natural Community Conservation Planning Act (NCCPA) for covered species. The Conservancy is the implementing entity for the ECCC HCP/NCCP and is made up of a joint powers authority of certain member agencies, however, a portion of the OGS transmission lines traverse the city of Antioch and the city of Antioch is not a member agency. Therefore, the OGS project must go through an application process with the Conservancy to ensure compliance with the ECCC HCP/NCCP. That process is taking place concurrently with the Energy Commission's AFC licensing process and any mitigation measures that result from that process are anticipated to be included in a Final Staff Assessment (FSA) or the FSA will reference compliance with the Conservancy's final decision on the project.

Transmission System Engineering – Staff has concluded that for project development to the first point of interconnection with the existing transmission network, the OGS will comply with LORS and any potential impacts would be mitigated through implementation of staff's proposed Conditions of Certification. However, according to Revision 2.0 to the Transmission Cluster Phase II Interconnection Study for PG&E's Greater Bay Area, three 230kV lines will require reconductoring in order to maintain the reliability of the transmission network. These include:

- 18.3-mile-long Contra Costa PP – Delta Pumps 230kV transmission line,
- 8-mile-long Kelso – Tesla 230kV transmission line; and
- 21-mile-long Las Positas – Newark 230kV transmission line.

These line upgrades represent indirect and reasonable foreseeable consequences of the OGS project and a general screening-level environmental analysis of the recondcutoring must be included in the FSA prepared for the project. The Kelso – Tesla 230kV transmission line reconductoring has been evaluated in staff's analysis of the recent Mariposa Energy Project and therefore staff can rely on that analysis for the OGS project; however, the applicant will be required to submit information to support additional screening-level environmental analysis for the Contra Costa PP – Delta Pumps and Las Positas – Newark 230 kV transmission lines.

Soil and Water Resources – Staff has not identified any immitigable potentially significant impacts to Soil and Water Resources for OGS and believes that OGS would comply with all applicable LORS provided the proposed conditions of certification are implemented. Staff is recommending that the project use recycled water within three years of commencing operations to limit freshwater use and provide consistency with the Energy Commission and State Water Resources Control Board policies on the use of fresh inland water for industrial uses and power plant cooling.

The local wastewater disposal service for the OGS project, Ironhouse Sanitary District (ISD), is currently constructing a new wastewater treatment plant approximately 2.5 miles from the OGS site. The new plant will provide tertiary treated recycled water in

close proximity to OGS. At this time, ISD is planning to complete construction of the new wastewater treatment plant in October 2011 with an initial dry weather flow of about 2.64 MGD.

Based on the availability of an adequate, tertiary treated, recycled water supply within close proximity of the OGS site, Energy Commission staff believes that use of recycled water would be technically and economically feasible.

NOTEWORTHY PUBLIC BENEFITS

Among others, the OGS project offers the following noteworthy benefits:

- Provide a efficient, reliable, and predictable power supply by using combined-cycle natural gas-fired combustion turbine technology capable of supporting the growing power needs of Contra Costa County.
- Use of state-of-the-art technology to provide operational flexibility and rapid-start and dispatch capability.
- Siting of the project near existing infrastructure, including electrical transmission lines, a high-pressure natural gas transmission pipeline, existing water lines, and nearby sewer lines.
- Provision of two combustion turbine generators, configured as independent equipment trains to provide greater inherent reliability.

CONCLUSIONS AND SCHEDULE

Based on the summary table above, and further supported by the detailed review of each technical section included in PSA Part A and PSA Part B, it appears that the OGS project will comply with all LORS and that any potential environmental impacts can be mitigated to a less-than-significant level, except for the technical areas of air quality and biological resources noted above, provided compliance with the recommended Conditions of Certification.

Staff anticipates conducting at least one public workshop on PSA Parts A and B in early February 2011, others may be conducted if warranted, and based on the comments received on the PSA and any other pertinent information, staff will prepare a Final Staff Assessment (FSA), which will represent staff's final analysis, conclusions, and recommendations on the OGS project.

ENVIRONMENTAL ASSESSMENT

AIR QUALITY

Joseph Hughes and Brewster Birdsall, P.E., QEP

SUMMARY OF CONCLUSIONS

Staff is not able to determine whether the proposed Oakley Generating Station (OGS) would conform with all applicable federal, state and Bay Area Air Quality Management District (BAAQMD) air quality laws, ordinances, regulations and standards (LORS), or that the proposed OGS project would not result in significant air quality-related impacts. The OGS applicant has not identified the specific emissions reductions they would use to mitigate the proposed project's air quality impacts nor have they demonstrated that they control sufficient emissions reductions. Staff identifies conditions of certification and concludes the following:

- The project would need to but has not demonstrated that it would be able to comply with all New Source Review and Best Available Control Technology (BACT) requirements.
- In conjunction with offsets required by BAAQMD, an additional emission reduction program or emission reduction credits should be surrendered for mitigation of particulate matter impacts under CEQA.

Global climate change and greenhouse gas emissions from the project are discussed and analyzed in **AIR QUALITY APPENDIX AIR-1**. The OGS would emit approximately 0.36 metric tonnes of carbon dioxide per megawatt hour (MTCO2/MWh). At these levels, OGS would comply with the limits of SB 1368 (Perata, Chapter 598, Statutes of 2006) and the greenhouse gas Emission Performance Standard for base load power plants seeking contracts with California's utilities. Mandatory reporting of the GHG emissions would occur while the Air Resources Board implements greenhouse gas regulations and/or trading markets. The project may be subject to GHG reduction or trading requirements as the GHG regulations are implemented.

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants from both the construction and operation of the proposed Oakley Generating Station (OGS) by Contra Costa Generating Station, LLC (applicant). The new OGS would be located in the City of Oakley, Contra Costa County, California, on a 21.95-acre parcel (the project site) that is currently part of a larger 210-acre parcel owned by E.I. DuPont de Nemours and Company (DuPont). The project site is on land that is zoned heavy industrial. The project would be located at 6000 Bridgehead Road near Wilbur Avenue.

Criteria air pollutants are defined as air contaminants for which the state and/or federal government has established an ambient air quality standard to protect public health. The criteria pollutants analyzed are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), inhalable particulate matter less than 10 microns in diameter (PM10), and fine particulate matter less than 2.5 microns in diameter (PM2.5). In addition, nitrogen oxides (NOx, consisting primarily of nitric oxide (NO) and NO_2),

sulfur oxides (SOx), and volatile organic compounds (VOC), also known as precursor organic compounds (POC), are also analyzed. NOx and VOC readily react in the atmosphere as precursors to ozone. NOx and SOx readily react in the atmosphere to form particular matter and are major contributors to acid rain. Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in the context of cumulative impacts (**AIR QUALITY APPENDIX AIR-1**).

In carrying out this analysis, the Energy Commission staff evaluated the following major points:

- Whether OGS is likely to conform with applicable federal, state, and Bay Area Air Quality Management District (BAAQMD or District) air quality laws, ordinances, regulations and standards (Title 20, California Code of Regulations, section 1744 (b));
- Whether OGS is likely to cause significant air quality impacts, including new violations of ambient air quality standards or substantial contributions to existing violations of those standards (Title 20, California Code of Regulations, section 1743); and
- Whether the mitigation measures proposed to the project are adequate to lessen the potential impacts to a level of insignificance (Title 20, California Code of Regulations, section 1742 (b)).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws, ordinances, regulations, and standards (LORS) and policies pertain to the control of criteria pollutant emissions and the mitigation of air quality impacts. Staff's analysis examines the project's compliance with these requirements, shown in **Air Quality Table 1**.

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	**U.S. Environmental Protection Agency**
Federal Clean Air Act Amendments of 1990 (CAAA), Title 40 Code of Federal Regulations (CFR) Part 50	National Ambient Air Quality Standards (NAAQS).
Clean Air Act (CAA) § 160-169A and implementing regulations, Title 42 United State Code (USC) §7470-7491, 40 CFR 51 & 52 (Prevention of Significant Deterioration Program)	Requires prevention of significant deterioration (PSD) review and facility permitting for construction of new or modified major stationary sources of pollutants that occur at ambient concentrations attaining the NAAQS. A PSD permit would not be required for OGS because it would be subject to federally-enforceable operating limitations to emit less than 100 tons per year of NO_2 and CO (BAAQMD 2010). The BAAQMD implements the PSD program for U.S. EPA within the San Francisco Bay Area.
CAA §171-193, 42 USC §7501 et seq., 40 CFR 51 Appendix S (New Source Review)	Requires new source review (NSR) facility permitting for construction or modification of specified stationary sources. Federal NSR applies to sources of designated nonattainment pollutants. This requirement is addressed through compliance with BAAQMD Regulation 2 Rule 1.
40 CFR 60, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. Requires monitoring of the natural gas fuel source for the proposed auxiliary boiler.
40 CFR 60, Subpart IIII	New Source Performance Standard (NSPS) for Stationary Compression Ignition Internal Combustion Engines. Requires the diesel fire water pump engine to achieve U.S. EPA Tier 3 emission standards.
40 CFR 60, Subpart KKKK	New Source Performance Standard (NSPS) for Stationary Combustion Turbines. Requires each proposed combustion turbine to achieve 15 parts per million (ppm) NOx or 0.43 pounds NOx per megawatt-hour (lb/MWh), achieve fuel sulfur standards, and provide reporting.
CAA §401 (Title IV), 42 USC §7651, 40 CFR 72 (Acid Rain Program)	Requires reductions in NOx and SO_2 emissions for electrical generating units greater than 25 MW, implemented through the Title V Federal Operating Permit program. This program is within the jurisdiction of the BAAQMD with U.S. EPA oversight [BAAQMD Regulation 2, Rule 7].
CAA §501 (Title V), 42 USC §7661, 40 CFR 70 (Federal Operating Permits Program)	Establishes comprehensive federal operating permit program for major stationary sources. Title V permit application required within one year following start of operation. This program is within the jurisdiction of the BAAQMD with U.S. EPA oversight [BAAQMD Regulation 2, Rule 6]

Applicable Law	Description
State	**California Air Resources Board and Energy Commission**
California Health & Safety Code (H&SC) §41700 (Nuisance Regulation)	Prohibits discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance.
H&SC §40910-40930	Permitting of source needs to be consistent with approved clean air plan. The BAAQMD New Source Review program is consistent with regional air quality management plans.
California Public Resources Code §25523(a); 20 CCR §1752, 2300-2309 (Memorandum of Understanding)	Requires that Energy Commission decision on AFC include requirements to assure protection of environmental quality consistent with Air Resources Board (ARB) programs.
Airborne Toxic Control Measure for Idling (ATCM, 13 CCR §2485)	ATCM to Limit Diesel-Fueled Commercial Motor Vehicle Idling – Generally prohibits idling longer than five minutes for diesel-fueled commercial motor vehicles.
Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM, 17 CCR §93115.6)	ATCM for Stationary Compression Ignition (CI) Engines. Establishes operating requirements and emission standards for emergency standby diesel-fueled CI engines [17 CCR 93115.6]. The emission standard is 0.15 g/bhp-hr diesel particulate matter for emergency engines used fewer than 50 hours per year for maintenance and engine testing.
Local	**Bay Area Air Quality Management District (BAAQMD)**
BAAQMD Regulation 1 – General	Limits releases of air contaminants to not "cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public." Prohibits contaminants that may endanger "the comfort, repose, health or safety of any such persons or the public, or cause injury or damage to business or property."
BAAQMD Regulation 2, Rule 1 – Permits	General Requirements – Specifies requirements for issuance or denial of permits, exemptions, and appeals against BAAQMD decisions. An Authority to Construct (ATC) is required for any non-exempt source. Natural gas-fired heaters with a heat input rate of less than 10 million Btu per hour are exempt, and stationary internal combustion engines and gas-fired combustion turbines with an output rating of less than 50 horsepower (hp) are exempt.
BAAQMD Regulation 2, Rule 2	New Source Review – Requires preconstruction review including Best Available Control Technology (BACT) for sources with the potential to emit more than 10 pounds per day (NOx, POC, PM10, CO, or SO_2). Requires surrendering offsets for facilities with the potential to emit more than 35 tons per year of NOx or POC, or 100 tons per year of PM10 or SOx.
BAAQMD Regulation 2, Rule 3	Permits – Power Plants – Requires Preliminary Determination of Compliance (PDOC) and Final Determination of Compliance (FDOC) by the BAAQMD Air Pollution Control Officer with public notice and public comment prior to ATC. The BAAQMD would issue the ATC after the Energy Commission certifies the project.

Applicable Law	Description
BAAQMD Regulation 2, Rule 5	NSR of Toxic Air Contaminants – Requires preconstruction review for new and modified sources of toxic air contaminants. Contains project health risk limits and requirements for Toxics BACT. See **Public Health**.
BAAQMD Regulation 2, Rule 6	Major Facility Review – Requires an application be submitted for the federal operating permit within 12 months after commencing operation, as specified by Title V federal Clean Air Act.
BAAQMD Regulation 2, Rule 7	Acid Rain – Requires monitoring, recordkeeping, and holding of allowances for pollutants that contribute to the formation of acid rain, as specified by Title IV of the federal Clean Air Act.
BAAQMD Regulation 6	Particulate Matter – Limits particulate matter and visible emissions to less than 20% opacity. Prohibits emissions from any activity for more than 3 minutes in any one hour that result in visible emissions as dark or darker than Number 1 on the Ringlemann Chart.
BAAQMD Regulation 7	Odorous Substances – Prohibits the discharge of any odorous substances which remain odorous at the property line after dilution with four parts of odor-free air. Limits the emissions of ammonia to no more than 5,000 parts per million (ppm).
BAAQMD Regulation 8	Organic Compounds – Requires use of architectural coatings and solvents meeting POC limits and compliant coatings. Emissions from solvent use must not exceed 5 tons annually.
BAAQMD Regulation 8, Rule 40	Aeration of Contaminated Soil and Removal of Underground Storage Tanks – Prohibits aeration of soil contaminated with organic chemical or petroleum chemical spills except through a control device that is at least 90% effective. However, no remediation activities are currently proposed in conjunction with preparing the site for the OGS. See **Public Health**.
BAAQMD Regulation 9, Rule 1	Sulfur Dioxide – Prohibits emissions causing SO2 ground level concentrations exceeding 0.5 ppm averaged continuously for three minutes or 0.25 ppm over 60 minutes, consistent with the California Ambient Air Quality Standard.
BAAQMD Regulation 9, Rule 7	Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters – Specifies emission limits of 9 ppm NOx and 400 ppm CO, applicable to the auxiliary boiler.
BAAQMD Regulation 9, Rule 7	Stationary Gas Turbines – Specifies emission limits of 5 ppmvd NOx or 0.15 pounds NOx per megawatt-hour (lb/MWh), applicable to the proposed combustion turbines.

SETTING

METEOROLOGICAL CONDITIONS

The climate in the San Francisco Bay Area is controlled by a semi-permanent subtropical high pressure system that is centered over the northeastern Pacific Ocean. In the summer, this high pressure system maintains clear skies inland and produces a

band of cold ocean water off the California coast that promotes low inversion layers and morning coastal fog. In winter, the high pressure weakens and moves south, promoting offshore winds and allowing storm systems to move into the area. The climate of the Carquinez Strait region where the proposed project would be located within the San Francisco Bay Area has hot dry summers and mild winters with precipitation almost exclusively in the winter. Very little precipitation occurs during the summer because storms are blocked by the high-pressure system. Temperature, winds and rainfall are variable during the winter months, and stagnant winter conditions are characterized by periods of light winds and nighttime drainage flows that are a reversal of the usual sea breeze.

Wind speeds are generally higher in spring, summer, and autumn, and are typically westerly. The stronger winds, commonly 15 to 20 miles per hour, are caused by a combination of high pressure offshore and a thermal low pressure resulting from higher temperatures inland. During the winter months, wind directions are more variable. The annual rainfall at the project site is around 13 inches and most precipitation (80%) occurs from November through March. During the summer, daily temperatures are typically between 50 and 90 °F. Winters have daily temperatures typically between 30 and 60 °F (WRCC 2010).

Along with the wind flow, atmosphere stability and mixing heights are important factors in the determination of air pollution dispersion. Atmospheric stability is an indicator of the air turbulence and mixing. When the air is less stable, there is more turbulence and more mixing, resulting in more air pollutant dispersion and therefore usually reduced air quality impacts near any single air pollution source. The mixing height is the height of the atmospheric layer in which convection and mechanical turbulence promote mixing. A high mixing height and at least moderate wind speeds within the mixing layer result in good air pollutant dispersion. In general, the frequent temperature inversions over the San Francisco Bay Area limit the mixing height and consequently limit the air dispersion. During the spring, summer, and autumn, the air pollution potential in the region is moderated by the strong westerly winds.

AMBIENT AIR QUALITY STANDARDS

The United States Environmental Protection Agency (U.S. EPA) and the California Air Resource Board (ARB) have both established allowable maximum ambient concentrations of criteria air pollutants. These ambient air quality standards are set to avoid potential public health impacts. These are based upon public health impacts and are called ambient air quality standards. The California Ambient Air Quality Standards (CAAQS), established by ARB, are typically lower (more stringent) than the federally established National Ambient Air Quality Standards (NAAQS).

The primary health effects of the criteria air pollutants are as follows:

- Ozone (O_3): aggravation of respiratory and cardiovascular diseases; impairment of cardiopulmonary function; and eye irritation. Ozone can also affect sensitive plant species by interfering with photosynthesis, and is therefore a threat to California agriculture and native vegetation.

- Particulate matter (PM10 and PM2.5): increased risk of chronic respiratory disease such as bronchitis, emphysema, and asthma; reduced lung function; increased cough and chest discomfort; and particulates may lodge in and/or irritate the lungs.
- Carbon monoxide (CO): impairment of oxygen transport in the bloodstream; aggravation of cardio-vascular disease; impairment of central nervous system function; fatigue, headache, confusion, dizziness; death at high levels of exposure; and aggravation of some heart diseases (angina).
- Nitrogen dioxide (NO_2): risk of acute and chronic respiratory disease.
- Sulfur dioxide (SO_2): aggravation of respiratory diseases (asthma, emphysema); reduced lung function; and irritation of eyes.

Ambient air quality standards are designed to protect people who are most susceptible to respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The ambient air quality standards are also set to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, and buildings.

Current state and federal air quality standards are listed in **Air Quality Table 2**. The averaging times for the various ambient air quality standards (the duration over which all measurements taken are averaged) range from one hour to one year. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per unit volume of air, in milligrams (mg or 10^{-3} g) or micrograms (µg or 10^{-6} g) of pollutant in a cubic meter (m^3) of ambient air, drawn over the applicable averaging period.

Air Quality Table 2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Standard
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	None
	8 Hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)[a]
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	150 µg/m^3
	Annual	20 µg/m^3	None
Fine Particulate Matter (PM2.5)	24 Hour	None	35 µg/m^3
	Annual	12 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	0.100 ppm[b]
	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)[c]
	24 Hour	0.04 ppm (105 µg/m^3)	None[d]

Source: ARB (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf), September 2010.
http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed November 2010.
Notes:
a. On January 6, 2010, the U.S. EPA proposed revising the federal 8-hour ozone standard to a range of 0.06 to 0.07 ppm.
b. The 1-hour NO_2 NAAQS is based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations.
c. On June 2, 2010, the U.S. EPA established a new federal 1-hour SO_2 standard.
d. On August 23, 2010, the U.S. EPA revoked both the existing Federal 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm.

The California Air Resources Board and the U.S. EPA designate regions where ambient air quality standards are not met as “nonattainment areas.” Where a pollutant exceeds standards, the federal and state Clean Air Acts both require air quality management plans that demonstrate how the standards will be achieved. These laws also provide the basis for implementing agencies to develop mobile and stationary source performance standards.

EXISTING AMBIENT AIR QUALITY

The federal and state attainment status of criteria pollutants in the San Francisco Bay Area are summarized in **Air Quality Table 3**. Overall air quality in the San Francisco Bay Area Air Basin is better than most other areas, including the South Coast, San Joaquin Valley, and Sacramento regions. This is due to a more favorable climate, with cooler temperatures and better ventilation. Although air quality improvements have occurred, violations and exceedances of the State ozone and PM standards continue to persist in the San Francisco Bay Area Air Basin, and still pose challenges to State and local air pollution control agencies (ARB 2009).

Air Quality Table 3
Attainment Status of Bay Area Air Quality Management District

Pollutants	State Classification	Federal Classification
Ozone (1-hr)	Nonattainment	No Federal Standard
Ozone (8-hr)	Nonattainment	Nonattainment (Marginal)
PM10	Nonattainment	Unclassified
PM2.5	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment

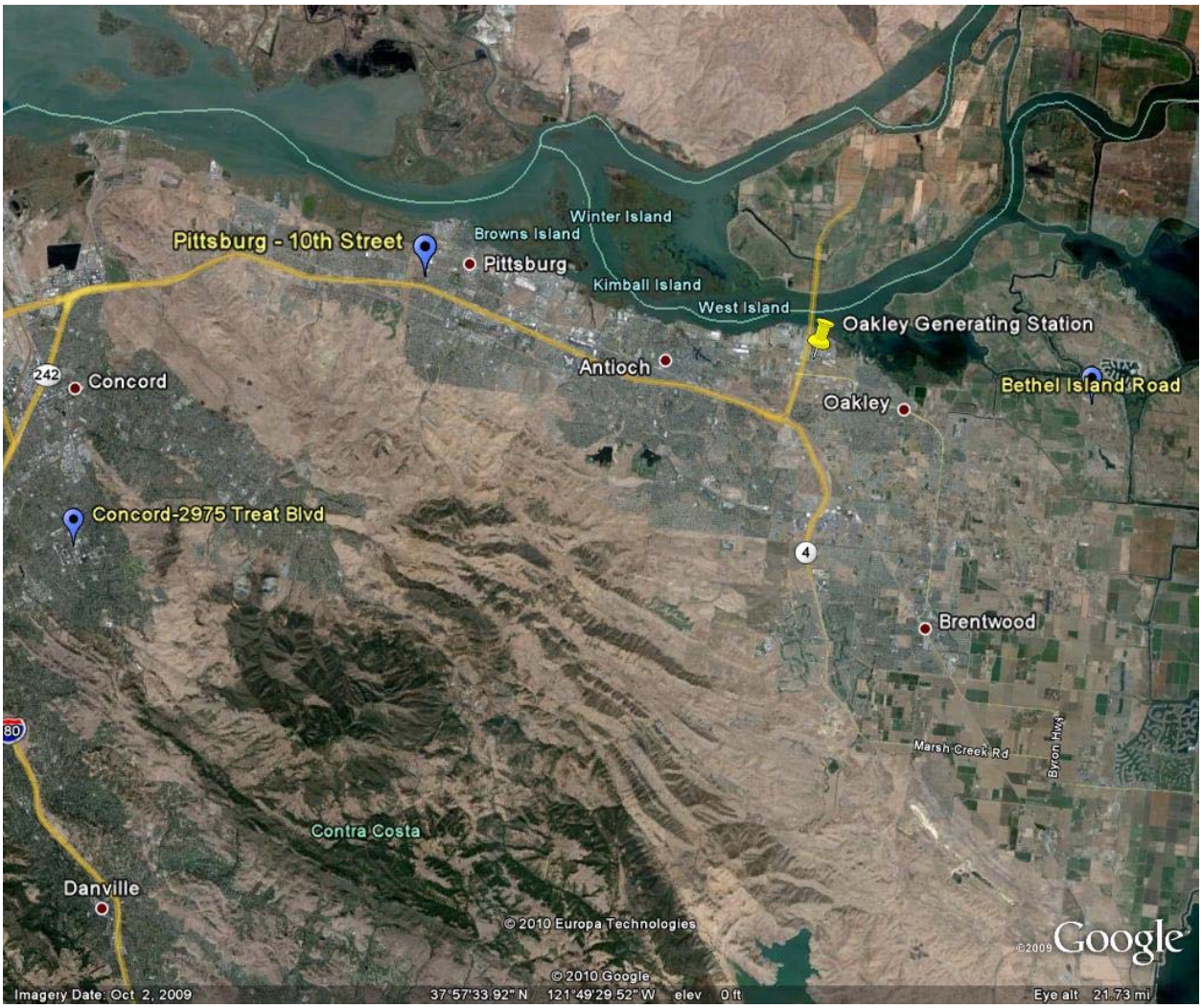
Source: http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm. Accessed July 2010.

Nonattainment Criteria Pollutants

This section summarizes the existing ambient monitoring data for nonattainment criteria pollutants (ozone and particulate matter) collected by ARB and BAAQMD from monitoring stations closest to the project site. Data marked in **bold** indicates that the most-stringent current standard was exceeded. Note that an exceedance is not necessarily a violation of the standard, and that only persistent exceedances lead to designation of an area as nonattainment.

The OGS project site is in northeastern Contra Costa County near Antioch city limits. The monitoring stations closest to the proposed site with long-term records of ozone, NO_2, CO, SO_2, PM10 include Pittsburg-10th Street, Concord-2975 Treat Blvd, and Bethel Island Road. The only monitoring station in Contra Costa County that monitors PM2.5 is the Concord station. **Air Quality Figure 1** gives a visual representation of the proximity of the selected monitoring stations. The Pittsburg-10th Street monitoring station is approximately 9 miles west of the OGS project site, the Concord-2975 Treat Blvd is approximately 16 miles southwest of the OGS project site, and the Bethel Island Road monitoring station is approximately 6 miles east of the OGS project site.

Air Quality Figure 1
Selected Air Quality Monitoring Stations



Ozone

Ozone is not directly emitted from stationary or mobile sources, but the contaminant is formed as the result of chemical reactions in the atmosphere between precursor air pollutants. The primary ozone precursors are NOx and VOC (also known as POC), which interact in the presence of sunlight and warm air temperatures to form ozone. Ozone formation is highest in the summer and fall, when abundant sunshine and high temperatures trigger the necessary photochemical reactions, and lowest in the winter. The days with the highest ozone concentrations tend to occur between June and August, and the region's ozone management season (and the BAAQMD "Spare the Air" program) normally runs from June 1 to October 12.

Air Quality Table 4 summarizes the ambient ozone data collected from the three different monitoring stations near the project site. Note that each site consistently records maximum concentrations near or above ambient air quality standards.

Air Quality Table 4 -- OGS, Background Ozone Air Quality Data (ppm)

Location, Year	Maximum 1-hour Ozone Concentration	Days Above CAAQS	Maximum 8-hour Ozone Concentration	Days Above NAAQS	Days Above CAAQS
Bethel Island Road					
2000	**0.115**	1	**0.085**	6	9
2001	**0.130**	3	**0.102**	8	13
2002	**0.111**	5	**0.096**	9	12
2003	0.092	0	**0.082**	6	9
2004	**0.103**	1	**0.081**	2	5
2005	0.089	0	**0.077**	1	2
2006	**0.116**	9	**0.090**	13	14
2007	0.093	0	**0.078**	1	4
2008	**0.109**	4	**0.090**	4	10
2009	**0.109**	2	**0.095**	3	6
Pittsburg-10th Street					
2000	**0.107**	1	**0.080**	2	5
2001	**0.118**	2	**0.092**	3	9
2002	**0.111**	4	**0.096**	5	12
2003	0.094	0	**0.080**	3	9
2004	0.090	0	**0.081**	1	2
2005	0.094	0	**0.078**	1	2
2006	**0.105**	3	**0.093**	6	10
2007	**0.100**	1	**0.074**	0	2
2008	**0.106**	1	**0.083**	1	2
2009	--	--	--	--	--
Concord-2975 Treat Blvd					
2000	**0.138**	2	**0.094**	2	6
2001	**0.134**	6	**0.087**	5	11
2002	**0.103**	5	**0.089**	5	10
2003	**0.101**	5	**0.085**	8	11
2004	**0.097**	1	**0.083**	3	6
2005	**0.098**	1	**0.080**	2	2
2006	**0.117**	8	**0.092**	9	14
2007	**0.105**	1	**0.081**	1	4
2008	**0.119**	3	**0.088**	6	8
2009	**0.106**	2	**0.088**	2	5

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html), Accessed July 2010.

Respirable Particulate Matter (PM10)

PM10 is a mixture of particles and droplets that vary in size and chemical composition, depending upon the origin of the pollution. An extremely wide range of sources, including natural causes, most mobile sources, and many stationary sources, causes emissions that directly and indirectly lead to increased ambient particulate matter. This makes it an extremely difficult pollutant to manage. Particulate matter caused by any combustion process can be generated directly by burning the fuel, but it can also be

formed downwind when various precursor pollutants chemically interact in the atmosphere to form microscopic, solid precipitates. These solids are called secondary particulate matter since the contaminants are not directly emitted, but the particles are indirectly formed as a result of precursor emissions. Gaseous contaminants such as NOx, SOx, organic compounds, and ammonia (NH_3) from natural or man-made sources can form secondary particulate nitrates, sulfates, and organic solids. Secondary particulate matter is mostly finer PM10, whereas particles from dust sources tend to be the coarser fraction of PM10.

Air Quality Table 5 shows that PM10 is primarily a winter problem, but that high regional PM10 levels can occur at other times of the year as well. This is because ammonium nitrate and ammonium sulfate particles tend to form most readily in colder weather and times of low wind speeds, high humidity, and stable conditions, whereas high levels of summertime PM10 tend to be caused by direct sources, including wildfires. Some of the highest concentrations of the past three years occurred during an episode on June 23 2008, a time of heavy wildfire activity in nearby Napa and Solano counties (the Wild Fire) and Lake County (the Walker Fire).

Air Quality Table 5 -- OGS, Background PM10 Air Quality Data (µg/m^3)

Location, Year	Maximum 24-hr PM10 Concentration[a]	Month of Maximum 24-hr Concentration	Days Above CAAQS[a]	Days Above NAAQS[a]	Annual Average PM10 Concentration[a]
Bethel Island Road					
2000	**65.1**	NOV	11.8	0.0	**20.4**
2001	**91.9**	JAN	25.1	0.0	**23.6**
2002	**61.2**	NOV	18.4	0.0	**24.4**
2003	**51.3**	OCT	6.1	0.0	19.4
2004	**42.3**	DEC	0.0	0.0	19.4
2005	**63.5**	OCT	5.7	0.0	18.4
2006	**84.3**	OCT	6.1	0.0	19.3
2007	49.4	NOV	0.0	0.0	18.7
2008	**77.0**	JUN	18.3	0.0	**24.1**
2009	39.1	JAN	--	0.0	--
Pittsburg-10th Street					
2000	**55.5**[b]	NOV	--	0.0	16.3[b]
2001	**97.7**[b]	JAN	--	0.0	**20.7**[b]
2002	**76.7**	NOV	18.0	0.0	**24.5**
2003	**59.1**	SEP	-	0.0	**20.2**[b]
2004	**64.0**	APR	6.0	0.0	**21.6**
2005	**57.0**	FEB	6.0	0.0	20.0
2006	**58.9**	OCT	11.5	0.0	19.9
2007	**59.0**	JAN	24.2	0.0	19.3
2008	**72.7**	JUN	--	--	19.9[b]
2009	--	--	--	--	--
Concord-2975 Treat Blvd					
2000	**56.4**	NOV	11.8	0.0	18.4
2001	**111.5**	JAN	18.0	0.0	**21.4**
2002	**65.8**	NOV	18.4	0.0	**21.6**
2003	34.0	DEC	0.0	0.0	16.4
2004	**50.7**	NOV	-	0.0	18.1[b]
2005	42.2	NOV	0.0	0.0	16.4
2006	**80.5**	JUL	17.6	0.0	18.5
2007	**52.4**	JAN	12.0	0.0	16.7
2008	**50.5**	JUN	6.0	0.0	17.5
2009	32.5	DEC	0.0	0.0	14.7

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html), Accessed November 2010.
Notes:
a. Concentrations shown in **Air Quality Table 5** are based upon federal reference methods. The number of days above the CAAQS (50 µg/m^3) is calculated by ARB. Because PM10 is monitored approximately once every six days, the potential number of violation days is calculated by multiplying the actual number of days of violations by six.
b. Where California measurements are not available the National measurements are shown.

Fine Particulate Matter (PM2.5)

Particles and droplets with an aerodynamic diameter less than or equal to 2.5 microns (PM2.5) penetrate more deeply into the lungs than PM10, so can therefore be much more damaging to public health than larger particles.

PM2.5 is mainly a product of combustion and includes nitrates, sulfates, organic carbon (ultra-fine dust), and elemental carbon (ultra-fine soot). Almost all combustion-related particles, including those from wood smoke and cooking, are smaller than 2.5 microns. Nitrate and sulfate particles are formed through complex chemical reactions in the atmosphere. Particulate nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the winter make up a large portion of the total PM2.5. Ammonium sulfate is also a concern because of the ready availability of ammonia in the atmosphere.

Air Quality Table 6 summarizes the ambient PM2.5 data collected from the Concord monitoring station at 2975 Treat Blvd, the only PM2.5 monitoring station in Contra Costa County.

Air Quality Table 6
OGS, Background PM2.5 Air Quality Data (μg/m^3)

Location, Year	Maximum 24-hr PM2.5 Concentration	Month of Maximum 24-hr PM2.5 Concentration	Days Above NAAQS	Annual Average PM2.5 Concentration
Concord-2975 Treat Blvd				
2000	**52.6**	DEC	15.1	11.0
2001	**85.4**	JAN	13.4	10.9
2002	**76.7**	NOV	27.3	**12.9**
2003	**49.7**	NOV	5.1	9.6
2004	**73.7**	DEC	-	-
2005	**48.9**	DEC	5.4	9.0
2006	**62.1**	DEC	5.5	9.3
2007	**46.2**	JAN	7.1	8.3
2008	**60.3**	JUN	7.0	9.3
2009	**39.0**	DEC	1.0	8.3

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html), Accessed July 2010.
Note: Concentrations shown are based upon federal reference methods.

Air Quality Table 6 shows that PM2.5 concentrations tend to exceed the standard in winter months, but not exclusively. During winter high particulate matter episodes, the contribution of ground level releases to ambient particulate matter concentrations is disproportionately high because of low wind speeds and relatively stable meteorology. The BAAQMD sponsors particulate matter management programs (including the "Winter Spare the Air" program) from November 1 to February 28 annually for managing the contribution of wood smoke particles, which make up a substantial fraction of ground level PM2.5 concentrations (ARB 2009).

Other Criteria Pollutants

Air Quality Table 7 shows the maximum concentrations for the criteria pollutants that occur in the vicinity of the project at concentrations that attain all ambient air quality standards.

Air Quality Table 7
OGS, Background Concentrations of Criteria Pollutants in Attainment (ppm)

Location, Year	Maximum 1-hr CO Concentration	Maximum 8-hr CO Concentration	Maximum 1-hr NO_2 Concentration	Annual Average NO_2 Concentration	Maximum 1-hr SO_2 Concentration	Maximum 24-hr SO_2 Concentration
Bethel Island Road						
2000	9.3	1.53	0.043	0.010	0.018	0.008
2001	8.5	1.50	0.044	0.010	0.015	0.008
2002	8.5	1.30	0.043	0.010	0.029	0.010
2003	12.7	0.89	0.045	0.009	0.016	0.008
2004	6.3	0.91	0.034	0.008	0.024	0.006
2005	5.9	0.91	0.038	0.007	0.017	0.006
2006	5.7	1.04	0.044	0.008	0.017	0.007
2007	5.2	0.84	0.048	0.008	0.018	0.005
2008	5.6	1.11	0.041	0.007	0.012	0.004
2009	4.4	0.94	0.033	0.006	0.013	0.003
Pittsburg-10th Street						
2000	4.9	2.45	0.054	0.013	0.028	0.009
2001	5.2	2.44	0.062	0.014	0.015	0.012
2002	6.2	2.51	0.054	0.013	0.111	0.016
2003	7.2	1.66	0.061	0.012	0.028	0.007
2004	4.1	1.91	0.048	0.011	0.035	0.008
2005	3.3	1.73	0.058	0.011	0.03	0.010
2006	3.3	1.92	0.052	0.011	0.045	0.009
2007	2.8	1.50	0.051	0.010	0.047	0.008
2008	2.8	1.44	0.056	0.010	0.023	0.006
2009	--	--	--	--	--	--
Concord-2975 Treat Blvd						
2000	7.9	2.70	0.074	0.016	0.045	0.005
2001	15.4	2.67	0.065	0.015	0.049	0.005
2002	4.3	2.28	0.063	0.015	0.044	0.007
2003	6.9	1.99	0.062	0.013	0.03	0.003
2004	3.9	2.00	0.065	0.012	0.042	0.010
2005	3.3	1.51	0.055	0.012	0.016	0.008
2006	3.5	1.30	0.047	0.011	0.017	0.006
2007	3.1	1.41	0.049	0.011	0.012	0.005
2008	2.5	1.13	0.050	0.010	0.011	0.005
2009	2.2	1.09	0.040	0.009	0.007	0.003

Source: ARB, Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html), Accessed July 2010. EPA 2010. http://www.epa.gov/aqspubl1/annual_summary.html.
Note: Official data for the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations of NO2 have not yet been released from ARB or EPA for comparison with the federal 1-hour NO2 standard.

Carbon Monoxide

Carbon monoxide (CO) is a by-product of incomplete combustion common to any carbon-bearing fuel-burning source. Mobile sources are the main sources of CO emissions. Ambient concentrations of CO are highly dependent on motor vehicle activity, with highest concentrations usually found near traffic congested roadways and intersections. Ambient CO concentrations attain the air quality standards due to two state-wide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phase I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to reduced CO emissions and long-term maintenance of the CO ambient air quality standards.

Nitrogen Dioxide

Approximately 90% of the NOx emitted from combustion sources is in the form of nitric oxide, while the balance is NO_2, although the percentage can vary by the type of fuel and the configuration of the combustion equipment. Once emitted from a stack, nitric oxide (NO) is oxidized in the presence of ozone to form NO_2, but some level of photochemical activity is needed for this conversion. High concentrations of NO_2 occur during the fall (not in the winter) when atmospheric conditions tend to trap ground-level releases but lack significant photochemical activity (less sunlight) to form ozone and nitric oxide. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) tend to engage the NO in reactions with VOC and POC to create ozone and also disperse the NO_2. The formation of NO_2 in the summer, with the help of the ozone, is according to the following reaction:

$$NO + O_3 \leftrightarrow NO_2 + O_2$$

Urban areas typically have relatively high daytime ozone concentrations that drop substantially at night as the above reaction takes place, and ozone scavenges the available NO. If ozone is unavailable to oxidize the NO, less NO_2 will form because the reaction is “ozone-limited.” This reaction explains why, in urban areas, ground-level ozone concentrations drop at night, while aloft and in downwind rural areas (without sources of fresh NO emissions), ozone concentrations can remain relatively high.

The current CAAQS for NO_2 became effective in early 2008, and the U.S. EPA adopted a new 1-hour standard of 0.100 ppm (188 $\mu g/m^3$) in early 2010. Although the attainment designations have not yet been established for the new, more stringent standards, the San Francisco Bay Area air basin appears likely to remain attainment for NO_2 under the new federal standard. The new federal 1-hour standard became effective in April 2010, but areas will not be given attainment designations until 2012. All recent data shows that the areas near the project site would attain all current state and federal NO_2 standards (ARB 2010). For the Pittsburg station, where local NO_2 concentrations tend to be highest, current 2007 to 2009 ARB data reflects an existing maximum 1-hour background concentration of 0.056 ppm (105.7 $\mu g/m^3$) and a 98th percentile of the daily

highest hourly concentration of 0.044 ppm (83.0 μg/m^3).[1] See **Air Quality Table 7** for maximum 1-hour and annual NO_2 concentrations at the closest monitoring stations.

Sulfur Dioxide

Sulfur dioxide is typically emitted as a result of the combustion of fuels containing sulfur. When high levels are present in ambient air, SO_2 leads to sulfite particulate formation and acid rain. Natural gas contains very little sulfur and therefore results in low SO_2 emissions when burned. By contrast, high sulfur fuels like coal emit large amounts of SO_2 when burned. Sources of SO_2 emissions come from every economic sector and include a wide variety of gaseous, liquid, and solid fuels. The entire state is designated attainment for all SO_2 ambient air quality standards.

Summary of Existing Ambient Air Quality

The recent and local ambient air quality data show existing violations of ambient air quality standards for ozone, PM10, and PM2.5. Staff uses the highest local background ambient air concentrations as the baseline for analyzing potential ambient air quality impacts for the proposed project. Attainment with limiting standards for PM2.5 and NO_2 is based on a statistical form and multi-year averaging, which, if applied to the background, would reveal lower concentrations than shown here. The highest background concentrations are shown in **Air Quality Table 8**.

The project impact modeling analysis was limited to the pollutants listed in **Air Quality Table 8**. Therefore, establishing background concentrations is not necessary for other criteria pollutants (ozone and lead).

[1] The 2007 to 2009 1-hour NO_2 federal design value is preliminarily provided by the California Air Resources Board. This may not reflect data that are complete or representative under U.S. EPA rules, nor do they reflect the higher concentrations that might be expected with the new near-roadway NO_2 monitoring requirements. As a result, the values are subject to change.

Air Quality Table 8
Staff-Recommended Background Concentrations (μg/m^3)

Pollutant	Averaging Time	Background	Limiting Standard	Percent of Standard
PM10	24 hour	**78.2**	50	**156**
	Annual	**23.6**	20	**118**
PM2.5	24 hour	**60.3**	35	**172**
	Annual	9.3	12	78
CO	1 hour	6,440	23,000	28
	8 hour	1,667	10,000	17
NO_2	1 hour	105.7	339	31
	1 hour Federal	83.0	188	44
	Annual	20.9	57	37
SO_2	1 hour	123.1	655	19
	1 hour Federal	122.8	196	63
	24 hour	21	105	20

Source: ARB 2010 and EPA 2010.
Note that an exceedance is not necessarily a violation of the standard, and that only persistent exceedances lead to designation of an area as nonattainment. Federal 1-hour NO_2 value is preliminarily provided by the California Air Resources Board. Federal 1-hour SO_2 data represents the maximum concentrations monitored using federal methods, not adjusted for statistical basis of 2010 federal standard.

PROJECT DESCRIPTION AND PROPOSED EMISSIONS

The proposed OGS would include the following new stationary sources of emissions, capable of generating a net electrical capacity of 624 MW (OGS 2009a; CH2MHILL 2010d, Revised AFC Section 5.1):

- Two General Electric (GE) 7FA natural gas-fired combustion turbine generators (CTG) with dry low-NOx (DLN) combustion and evaporative inlet air cooling with a nominal capacity of 213 MW and a heat input capacity of up to 2,150 MMBtu/hr for each gas turbine (higher heating value), in a combined cycle configuration; and
- Two non-fired Heat Recovery Steam Generators (HRSGs) capable of 643,000 lb/hr nominal steam production rating, coupled to a single GE D11 condensing steam turbine generator capable with a nominal rating of 218 MW.
- Auxiliary boiler rated at 50.6 MMBtu/hr, fired on pipeline quality natural gas and estimated steam production of 34,000 lb/hr.
- Three cell evaporative cooler for inlet air cooling with water circulation rate of 5,880 gallons/minute, expected total dissolved solids (TDS) of 1,500 parts per million (ppm), and mist eliminator efficiency of 0.003%.
- Fire water pump engine fueled on ultra low sulfur diesel, rated at 400 brake horse-power (bhp) and certified to achieve ARB Tier 3 emission standards.

The project is planning to operate as a base load power plant and is proposed to be permitted to operate up to approximately 8,463 hours per year (annual capacity factor of 97%), with an expected actual capacity factor at 60 to 80%.

The CTGs would each be equipped with evaporative coolers to decrease the temperature of the inlet air under warm weather circumstances. The chilled air would be drawn into the turbine combustion chamber to increase power output and efficiency. The proposed OGS also would include other facilities causing minor exempt levels of emissions. These include a new administration and control room building, one aqueous ammonia storage tank, an oil/water separator for wastewater management, and electrical circuit breakers and transformers (OGS 2009a, AFC Section 2.0).

Separate emissions estimates for the proposed project during the construction phase, initial commissioning, and operation are each described next.

PROPOSED CONSTRUCTION EMISSIONS

Construction of the OGS is expected to take about 33 months (CH2MHILL 2010d, Revised AFC Section 5.1). Onsite construction activities include site preparation, foundation work, construction and installation of major structures, and, installation of major equipment. The main site is approximately 20 acres in size and is essentially flat. A laydown yard sized at 20 acres lies immediately adjacent to the main site. The total acreage for purposes of calculating on-site emissions will be approximately 20 acres. Offsite linear acreages will be approximately 5.27 acres. The site is currently part of the existing DuPont facility. As such, the site will require only minimum grading and leveling prior to construction of the power block and cooling tower cell additions. Site preparations include finish grading, excavation of footings and foundations, and backfilling operations. After site preparation is finished, the construction of the foundations and structures is expected to begin. Once the foundations and structures are finished, installation and assembly of the mechanical and electrical equipment are scheduled to commence (CH2MHILL 2010d, Appendix 5.1E).

Fugitive dust emissions would result from:

- Dust entrained during site preparation and finish grading/excavation at the construction site;
- Dust entrained during on-site travel on paved and unpaved surfaces;
- Dust entrained during aggregate material and soil loading and unloading operations; and
- Wind erosion of soil at areas disturbed during construction activities.

Combustion-related emissions would be the result of:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, and construction of onsite structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from diesel-powered welding machines, electric generators, air compressors, and water pumps;
- Exhaust from gasoline and diesel trucks used to transport workers and materials around the construction site;

- Exhaust from diesel trucks used to deliver concrete, fuel and construction supplies to and from the construction site; and
- Exhaust from automobiles used by workers commuting to the construction site.

Estimates for the highest daily emissions and total annual emissions over the 33-month construction period are shown in **Air Quality Table 9** and **10**.

Air Quality Table 9
OGS Construction, Maximum Daily Emissions (lbs/day)

	NOx	VOC	PM10	PM2.5	CO	SOx
Onsite Construction Emissions						
Construction Equipment Exhaust	164.80	24.80	9.50	9.40	83.80	0.20
Site Support Vehicle Emissions	1.20	1.19	0.11	0.11	11.58	0.002
Onsite Fugitive Dust Emissions	--	--	15.60	3.30	--	--
Paved Road Fugitive Dust	--	--	0.46	0.05	--	--
Subtotal of Onsite Emissions	**166.00**	**25.99**	**25.67**	**12.86**	**95.38**	**0.20**
Offsite Construction Emissions						
Delivery Vehicle Exhaust	7.52	0.43	0.29	0.28	2.10	0.011
Worker Travel Vehicle Exhaust	2.45	2.76	0.24	0.24	26.18	0.003
Rail Deliveries to Construction Site	6.76	0.31	0.20	0.20	1.29	0.16
Offsite Construction Fugitive Dust	--	--	0.90	0.19	--	--
Track Out Fugitive Dust	--	--	0.94	0.16	--	--
Subtotal of Offsite Emissions	**16.73**	**3.5**	**2.57**	**1.07**	**29.57**	**0.174**
Total Maximum Daily Emissions	**182.73**	**29.49**	**28.24**	**13.93**	**124.95**	**0.374**

Source: AFC Appendix 5.1E (CH2MHILL 2010d); Response to DR33 (CH2MHILL 2010a).

Air Quality Table 10
OGS Construction, Total 33-month Construction Period Emissions (tons)

	NOx	VOC	PM10	PM2.5	CO	SOx
Onsite Construction Emissions						
Construction Equipment Exhaust	38.60	5.80	2.23	2.21	19.60	0.000
Site Support Vehicle Emissions	0.44	0.43	0.04	0.04	4.20	0.001
Onsite Fugitive Dust Emissions	--	--	1.10	0.20	--	--
Paved Road Fugitive Dust	--	--	0.14	0.01	--	--
Subtotal of Onsite Emissions	**39.04**	**6.23**	**3.51**	**2.46**	**23.8**	**0.001**
Offsite Construction Emissions						
Delivery Vehicle Exhaust	2.73	0.15	0.10	0.10	0.76	0.004
Worker Travel Vehicle Exhaust	0.89	1.00	0.09	0.09	9.50	0.001
Rail Deliveries to Construction Site	0.68	0.03	0.02	0.02	0.13	0.02
Offsite Construction Fugitive Dust	--	--	0.27	0.06	--	--
Track Out Fugitive Dust	--	--	0.28	0.05	--	--
Subtotal of Offsite Emissions	**4.3**	**1.18**	**0.76**	**0.32**	**10.39**	**0.007**
Total Construction Period Emissions	**43.34**	**7.41**	**4.27**	**2.78**	**34.19**	**0.008**

Source: AFC Appendix 5.1E (CH2MHILL 2010d); Response to DR33 (CH2MHILL 2010a).

PROPOSED INITIAL COMMISSIONING EMISSIONS

New electrical generation facilities must go through initial commissioning phases before becoming commercially available to generate electricity. During this period, initial firing causes greater emissions than those that occur during normal operations because of

the need to tune the combustor, conduct numerous startups and shutdowns, operate under low loads, and conduct testing before emission control systems are functioning or fine-tuned for optimum performance.

The applicant expects that about 415 hours of commissioning with emissions above normal operation limits for each CTG would be needed (CH2MHILL 2010d, Table 5.1-21 and Appendix 5.1A, Table 5.1A-5b) to accomplish the following 3 stages of commissioning activities:

- Stage 1 – combustion turbine first fire and combustion turbine full speed /no load testing. During this stage of commissioning the DLN and SCR/CO would not be operated. An estimated 72 hours per turbine would be required.
- Stage 2 – steam blow, combustion turbine tuning, and partial load testing. During this stage of commissioning the DLN would be in partial operation and the SCR/CO would not be operated. An estimated 218 hours per turbine would be required.
- Stage 3 – combustion turbine full load testing, combustion turbine tuning, and SCR tuning. During this stage the DLN and SCR/CO will be in partial operation. An estimated 72 hours per turbine would be required.

Air Quality Table 11 presents the applicant's anticipated maximum hourly and daily short-term emissions of criteria pollutants. Maximum hourly emissions for NOx, VOC, and CO would occur with the gas turbine undergoing initial load tests before emission control systems are installed and operational. Emission rates for PM10, PM2.5, and SOx during initial commissioning are not expected to be higher than normal operating emissions. This is because PM10 and SOx emissions are proportional to fuel use. The total initial commissioning emissions would be subject to all annual emission limitations applicable to normal operations (BAAQMD 2010).

Air Quality Table 11
OGS, Maximum Initial Commissioning Emissions (hourly, daily, and total)

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each CTG Maximum Commissioning (lb/hr)	148.7	37.9	7.74	700	6.0
Each CTG Maximum Commissioning (lb/day)	2,380.8	1,320	--	13,303	--
Each CTG Total Commissioning (ton)	28.6	6.4	3.2	40.8	2.5

Source: CH2MHILL 2010d, Appendix 5.1A Table 5.1A-5b; PDOC (BAAQMD 2010) with staff estimate for PM10 and SOx.

PROPOSED OPERATION EMISSION CONTROLS

NOx Controls

Each combustion turbine would use dry low-NOx (DLN) combustors to maintain low levels of NOx formation while ensuring complete combustion of the fuel and a Selective Catalytic Reduction (SCR) system for post-combustion NOx control. Exhaust from each turbine would enter the SCR system before being released into the atmosphere. SCR refers to a process that chemically reduces NOx to nitrogen (N_2) and water vapor (H_2O) by injecting ammonia (NH_3) into the flue gas stream in the presence of a catalyst and

excess oxygen. The process is termed selective because the ammonia preferentially reacts with NOx rather than oxygen. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or noble metals are also used. Regardless of the type of catalyst used, efficient conversion of NOx to nitrogen and water vapor requires the uniform mixing of ammonia into the exhaust gas stream and a catalyst surface large enough to ensure sufficient time for the reaction to take place. The auxiliary boiler would be equipped with ultra low NOx burners and flue gas recirculation (FGR) without SCR (CH2MHILL2010d).

VOC and CO Controls

Emissions of CO and unburned hydrocarbons, including VOC and POC, would be controlled with an oxidation catalyst installed in conjunction with the SCR catalyst. An oxidation catalyst system chemically reacts with organic compounds and CO with excess oxygen to form carbon dioxide (CO_2) and water. Unlike the SCR system for reducing NOx, an oxidation catalyst does not require any additional chemicals.

PM10/PM2.5 and SOx Controls

The CTGs would fire exclusively pipeline-quality natural gas, a clean-burning fuel that contains very little sulfur or noncombustible solid residue, will limit the formation of SOx and particulate matter. Natural gas does contain small amounts of a sulfur-based scenting compound known as mercaptan as a safety measure, which results in some SOx emissions when burned. However, in comparison with other fossil fuels used in thermal power plants, such as coal and oil, SOx emissions from natural gas are very low. Particulate matter emissions from natural gas combustion are also very low compared with other fossil fuels. The sulfur content of pipeline-quality natural gas is normally less than 1 grain of sulfur per 100 cubic feet at standard temperature and pressure (gr/100 scf). Inlet air filtration also helps to control particulate emissions.

Ammonia Emissions Resulting from NOx Controls

Ammonia is injected into the flue gas stream as part of the SCR system that controls NOx emissions. In the presence of the catalyst, the ammonia and NOx react to form harmless elemental nitrogen and water vapor. However, not all of the ammonia reacts with the flue gases to reduce NOx; a portion of the ammonia passes through the SCR system and is emitted unaltered from the stacks. These ammonia emissions are known as ammonia slip. The applicant proposes to limit ammonia slip (NH_3) emissions from each CTG emission control system to 5 ppmvd.

PROPOSED OPERATION EMISSIONS

Air Quality Table 12 through **Air Quality Table 15** summarize the maximum (worst-case) criteria pollutant emissions associated with the OGS project's normal and routine operation. Emissions for each CTG/HRSG are based upon:

- NOx emissions controlled to 2.0 parts per million by volume, dry basis (ppmvd) corrected to 15% oxygen (1.5 ppmvd assumed for annual average), averaged over any 1-hour period except during startups and combustor tuning;
- VOC, also known as POC, emissions controlled to 1.0 ppmvd at 15% O_2;

- CO emissions controlled to 2.0 ppmvd at 15% O_2 for any 1-hour period (1.0 ppmvd for annual average);
- PM10 emissions at 7.74 lb/hr based on exclusive use of pipeline-quality natural gas fuel with no provisions for an alternative or backup fuel (based on PM10 emission factor of 0.0036 lb/MMBtu; BAAQMD 2010); and
- SOx emissions based on hourly or daily levels of fuel sulfur content of up to 1 gr/100 scf in the short-term (an emission factor of 0.00281 lb/MMBtu), and annually averaging 0.25 gr/100 scf.

Air Quality Table 12 lists the maximum hourly emissions from the proposed equipment. Emissions for NOx, CO, and VOC during startup and shutdown events would have higher emissions than during normal operation. Allowable emissions during startups are also shown. The PDOC is based on a cold startup taking no longer than 90 minutes and warm/hot startups taking no longer than 30 minutes (BAAQMD 2010). Since PM10 and SOx emissions are proportional to fuel use, PM10 and SOx emissions rates would be lower during any partial-load operation.

Air Quality Table 12
OGS, Maximum Hourly Emissions (pounds per hour [lb/hr])

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each CTG (steady-state, full load)	15.52	2.71	7.74	9.45	6.0
Each CTG (cold startups)	99.9	67.7	7.74	362.4	6.0
Each CTG (warm/hot startups)	33.9	33.1	7.74	92.2	6.0
Each CTG Combustor Tuning Hour	96.0	67.0	7.74	360.0	6.0
Each CTG (shutdown)	46.8	18.4	7.74	144.7	6.0
Auxiliary Boiler (steady-state)	0.42	0.11	0.35	0.37	0.14
Auxiliary Boiler (startup/shutdown)	1.27	0.32	0.35	1.11	0.14
Auxiliary Boiler (commission/tuning)	2.55	0.63	0.35	2.22	0.14
Diesel Fire Water Pump Engine	2.311	0.122	0.105	0.592	0.004
Evaporative Inlet Air Cooler	--	--	0.132	--	--
Oil-Water Separator	--	0.024	--	--	--

Source: AFC (CH2MHILL 2010d, Appendix 5.1A); PDOC (BAAQMD 2010).

Air Quality Table 13 lists the worst-case emissions during any given day of operation of the proposed OGS. The District assumed a reasonable maximum operating scenario consists of one cold startup lasting 45 minutes and with the maximum permitted cold startup emissions; one shutdown lasting 30 minutes and with maximum permitted shutdown emissions; and the remaining 22.75 hours of the day in normal steady-state operation. For days on which combustor tuning occurs (limited to twice per year per turbine), 6 hours of the 22.75 steady-state operating hours were assumed to involve combustor tuning. The District based the proposed daily emissions limits on these assumptions as a reasonable scenario of maximum foreseeable daily emissions, but it is important to note that emissions from this equipment will be limited to these rates regardless of actual operating profile (BAAQMD 2010).

Air Quality Table 13
OGS, Maximum Daily Emissions (pounds per day [lb/day])

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each CTG (without tuning)	488	146	186	715	144
Each CTGs (with tuning)	1,132	660	186	3,519	144
Auxiliary Boiler	9.8	2.8	8.5	9.8	3.4
Diesel Fire Pump Engine	55.5	2.9	2.5	14.2	0.1
Evaporative Inlet Air Cooler	--	--	3.2	--	--
Oil Water Separator	--	0.6	--	--	--

Source: AFC (CH2MHILL 2010d, Appendix 5.1A); PDOC (BAAQMD 2010).

Air Quality Table 14 lists maximum potential annual emissions from the proposed project, based on applicant and District calculations reviewed by staff. The annual operating emission rates are based on three worst case operating scenarios that provide maximum project impact for each criteria pollutant. The operating assumptions are provided in the notes for **Air Quality Table 14**. The project would be available for either base-load or load-following power, up to an allowable annual capacity factor of 97%, equivalent to 8,463 hours annually (BAAQMD 2010).

Air Quality Table 14
OGS, Maximum Annual Emissions (tons per year [tpy])

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Total Two CTGs Maximum Annual	98.626	29.274	63.715	98.000	12.524
Auxiliary Boiler	0.099	0.217	0.060	0.803	0.024
Diesel Fire Water Pump Engine	0.057	0.003	0.003	0.015	0.0001
Evaporative Inlet Air Cooler	--	--	0.099	--	--
Oil Water Separator	--	0.105	--	--	--
Total Maximum Annual Emissions	**98.78**	**29.60**	**63.88**	**98.82**	**12.55**

Source: AFC (CH2MHILL 2010d, Appendix 5.1A); PDOC (BAAQMD 2010).
Notes:
a. Annual NOx, PM, and SO_2 emissions are based on 8,463 hours per year of operation from the turbines (including 1 cold start, 51 hot starts, 52 shutdowns), 401 hours for the auxiliary boiler (including 52 startups and 52 shutdowns), 1,500 hours per year for the evaporative fluid cooler, and 49 hours per year of maintenance and testing for the fire pump diesel engine. Gas turbine annual NOx emissions are based on expected 1.5 ppmvd; annual SO_2 emissions are based on annual average grain loading (0.25 gr/100 scf) and 1.5 lb/hr emission rate.
b. Annual CO emissions are based on 5,390 hours per year of operation from the turbines (including 25 cold starts, 275 warm/hot starts, 300 shutdowns), 3,978 hours for the auxiliary boiler (including 300 startups and 300 shutdowns), 1,500 hours per year for the evaporative fluid cooler, and 49 hours per year of maintenance and testing for the fire pump diesel engine. Gas turbine annual CO emissions are based on expected 1.0 ppmvd.
c. Annual VOC emissions are based on 5,662 hours per year of operation from the turbines (including 1 cold start, 311 hot/warm starts, 312 shutdowns) and 3,717 hours for the auxiliary boiler (including 312 startups and 312 shutdowns), 1,500 hours per year for the evaporative fluid cooler, and 49 hours per year of maintenance and testing for the fire pump diesel engine.

Worker trips and material deliveries cause emissions of criteria pollutants from mobile sources operating offsite. These are shown in **Air Quality Table 15** based on 22 plant employees commuting daily and about 60 deliveries of ammonia and other materials per month (CH2MHILL 2010a).

Air Quality Table 15
OGS, Annual Offsite Emissions (tpy)

Source	NOx	VOC	PM10	PM2.5	CO	SOx
Worker Commutes (Offsite)	0.05	0.05	0.01	0.01	0.49	< 0.01
Material Deliveries (Offsite)	0.14	0.03	<0.01	<0.01	0.35	<0.01
Total Annual Emissions (tpy)	**0.19**	**0.08**	**0.01**	**0.01**	**0.84**	**<0.01**

Source: Response to DR28, Attachment DR28-1 (CH2MHILL 2010a).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff characterizes air quality impacts as follows: All project emissions of nonattainment criteria pollutants and their precursors (NOx, VOC, PM10, PM2.5, SOx, and NH_3) are considered significant and must be mitigated. For short-term construction activities that essentially cease before operation of the power plant, our assessment is qualitative and mitigation consists of controlling construction equipment tailpipe emissions and fugitive dust emissions to the maximum extent feasible. For operating emissions, the mitigation includes both the Best Available Control Technology (BACT) and emission reduction credits (ERC) or other valid emission reductions to offset emissions of both nonattainment criteria pollutants and their precursors.

The ambient air quality standards used by staff as the basis for characterizing project impacts are health-based standards established by the ARB and U.S. EPA. They are set at levels that contain a margin of safety to adequately protect the health of all people, including those most sensitive to adverse air quality impacts such as the elderly, persons with existing illnesses, children, and infants.

PROPOSED PROJECT IMPACTS AND MITIGATION

Ambient air quality impacts occur when project emissions cause the ambient concentration of a pollutant to increase. Project-related emissions are the actual mass of emitted pollutants, which are diluted in the atmosphere before reaching the ground. Analysis begins with quantifying the emissions, and then uses an atmospheric dispersion model to determine the probable change in ground-level concentrations caused by those emissions.

Dispersion models complete the complex, repeated calculations that analyze the emissions in the context of various ambient meteorological conditions, local terrain, and nearby structures that affect air flow. For the OGS, the surface meteorological data used as an input to the dispersion model included five years (2001-2002 and 2004-2006)[2] of hourly wind speeds and directions measured at the Contra Costa Power Plant meteorological station, combined with upper-air meteorological data from the Oakland International Airport monitoring station.

[2] Complete meteorological data were not available for 2003.

The applicant conducted the air dispersion modeling based on guidance presented in the Guideline on Air Quality Models (EPA, 2005) and the American Meteorological Society/Environmental Protection Agency Regulatory Model, known as AERMOD (version 09292). The U.S. EPA designates AERMOD as a "preferred" model for refined modeling in all types of terrain. For determining impacts during inversion breakup fumigation and shoreline fumigation conditions, the U.S. EPA SCREEN3 model was used. The original modeling protocol was submitted in April 2009, in advance of the AFC, and was subject to independent Energy Commission staff review (AFC Appendix 5.1C; OGS 2009a). However, the applicant's original modeling was completed before the new federal short-term NO_2 standard was adopted, and because the form of the standard is different than most other pollutants, modeling requires additional post-processing of the NO_2 results, which the applicant provided later in the process (CH2MHILL2010d). The worst-case results are shown in this Preliminary Staff Assessment.

The applicant version of the impact assessment for NOx emissions is refined by using the Ozone Limiting Method (OLM), which determines NO_2 impacts from short-term emissions (1-hour averaging period) and concurrent hourly ozone data from the area, using data from the Pittsburg monitoring station. The staff version uses Plume Volume Molar Ratio Method (PVMRM) to arrive at similar results. Because project NOx emissions would be approximately 90% NO that could oxidize into NO_2 with sufficient time, sunlight, and availability of organic compounds or ozone, use of the PVMRM or OLM is appropriate.

The 1-hour NO_2 results are shown here in two forms. The state standard uses the maximum concentration for any one year. These results are not comparable to the new federal standard promulgated by U.S. EPA in 2010, after the June 2009 application filing date. The federal 1-hour NO_2 standard is expressed as a 3-year average of the 98th percentile value of the daily maximum 1-hour NO_2 concentrations. For comparison with the federal 1-hour standard, staff shows the results of the applicant's analysis, which is based on the 5-year average concentration of 8th highest daily maximum concentrations (comparable to the 98th percentile of the daily maximum) including concurrent background 1-hour NO_2 concentrations (CH2MHILL2010d). Where the modeled 1-hour NO_2 concentration is paired with the concurrent hourly monitored background concentration, the NO_2 result is shown as "paired" in staff's tables. For the paired computation, hourly concurrent background values are used, not those shown in **Air Quality Table 8**.

Project-related modeled concentrations for all other pollutants are added to highest monitored background concentrations to arrive at the total project impact. The total impact is then compared with the ambient air quality standards for each pollutant to determine whether the project's emissions would either cause a new violation of the ambient air quality standards or contribute to an existing violation.

Construction Impacts and Mitigation

This section discusses the project's short-term direct construction ambient air quality impacts assessed by the applicant and, as necessary, independently assessed by Energy Commission staff. The ambient air quality impacts are modeled using AERMOD, and the impacts for NO_2 are modeled using the OLM procedure in AERMOD.

Air Quality Table 16 summarizes the results of the modeling analysis for construction activities. The total impact is the sum of the existing background condition plus the maximum impact predicted by the modeling analysis for project activity. The values in **bold** in the Impact and Background columns represent the values that either equal or exceed the relevant ambient air quality standard.

Air Quality Table 16
OGS, Construction-Phase Maximum Impacts (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	**122.0**	**78.2**	**200.2**	50	**400**
	Annual	2.3	**23.6**	**25.9**	20	**130**
PM2.5	24 hour	25.8	**60.3**	**86.1**	35	**246**
	Annual	0.6	9.3	9.9	12	83
CO	1 hour	48	6,440	6,488	23,000	28
	8 hour	18	1,667	1,685	10,000	17
NO_2 [a]	1 hour	89.9	105.7	195.6	188	58
	Annual	19.5	20.9	40.4	57	71
SO_2	1 hour	0.11	123.1	123.2	655	19
	24 hour	0.02	21	21.0	105	20

Source: Appendix 5.1B Table 5.1B-5 (CH2MHILL 2010d), with independent staff assessment for PM10/PM2.5.
Note: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output, and the ambient ratio method (ARM) is applied for annual NO_2, using national default 0.75 ratio.

The construction-phase PM10 and PM2.5 impacts include both dust and exhaust from combustion. For the 24-hour PM10 construction dust impacts, the maximum modeled project construction impacts would occur at the northeastern property boundary. The highest diesel exhaust combustion-related impact would be about 2 μg/m^3 (24-hour PM10/PM2.5) at the southwestern property boundary. Over a limited area, the construction-phase modeled impact would be greater than 50 μg/m^3 (in addition to the background concentration); this impact area is limited to approximately a 1/4 mile radius (1,320 feet) with the highest concentrations being north and east of the project site. For each pollutant, the concentrations would decrease rapidly with distance. The nearest residential receptors are located approximately 900 feet (275 meters) southwest of the site, 2,350 feet (720 meters) east of the site, and approximately 3,280 feet (1,000 meters) northeast of the project boundary (near Big Break Marina). In the vicinity of the nearest residential receptors located approximately 900 feet (275 meters) southwest of the site, the modeled construction impact for PM10 would be about 40% (20 μg/m^3) of the limiting standard (50 μg/m^3). In the vicinity of Big Break Marina and Big Break Road, the modeled construction impact for PM10 would be about 10% (5 μg/m^3) of the limiting standard (50 μg/m^3).

Staff believes that particulate matter emissions from construction would cause a significant impact because they will contribute to existing violations of PM10 and PM2.5 ambient air quality standards, and additionally that those emissions can and should be mitigated to a level of insignificance. Although not modeled, significant secondary impacts would also occur for PM10, PM2.5, and ozone because construction-phase emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would contribute to existing violations of these standards. The direct impacts

of NO_2, in conjunction with worst-case background conditions, would not create a new violation of the applicable NO_2 ambient air quality standards. The direct impacts of CO and SO_2 would not be significant because construction of the project would neither cause nor contribute to a violation of these standards. Mitigation should be provided for construction emissions of PM10, PM2.5, SOx, NOx, and VOC to reduce PM10, PM2.5, NO_2, and ozone impacts. The federal NO_2 standard was not modeled for construction-related impacts because the standard is based upon a 3-year average, and construction would not persist more than three years.

Construction Mitigation

The applicant proposes to reduce construction-related emissions of particulate matter, particulate matter precursors, and ozone precursors by implementing measures consistent with local air district requirements limiting visible emissions and nuisances. The applicant expects to implement controls for construction activities requiring the use of water or chemical dust suppressants to minimize PM10 emissions and prevent visible particulate emissions, consistent with measures adopted in previous similar Energy Commission licensing cases.

Staff recommends specific construction mitigation measures to ensure enforceable reductions of the potential impacts. Measures recommended by staff would reduce construction-phase impacts to a less than significant level by reducing construction emissions of particulate matter and combustion contaminants. The short-term and variable nature of construction activities warrants a qualitative approach to mitigation. Construction emissions and the effectiveness of mitigation varies widely depending on variable levels of activity, the specific work taking place, the specific equipment, soil conditions, weather conditions, and other factors, making precise quantification difficult. Despite this variability, there are a number of feasible control measures that can be implemented to significantly reduce construction emissions. Staff has determined that the use of oxidizing soot filters is a viable emissions control technology for all heavy diesel-powered construction equipment that does not use an ARB-certified low emission diesel engine. In addition, staff proposes that, prior to beginning construction the applicant should provide an Air Quality Construction Mitigation Plan (AQCMP) that specifically identifies mitigation measures to limit air quality impacts during construction. Staff includes proposed staff Conditions of Certification **AQ-SC1** through **AQ-SC5** to implement these requirements. These conditions are consistent with both the applicant's proposed strategy and the conditions of certification adopted in similar prior licensing cases. Compliance with these conditions would substantially eliminate the potential for significant air quality impacts during construction of the OGS project.

Operation Impacts and Mitigation

The following section discusses ambient air quality impacts that were estimated by the applicant and subsequently evaluated by Energy Commission staff. The applicant performed a number of direct impact modeling analyses, including both fumigation modeling and modeling for impacts during commissioning.

Routine Operation Impacts

A refined dispersion modeling analysis was performed by the applicant to identify off-site criteria pollutant impacts that would occur from routine operational emissions

throughout the life of the project. The worst case one-hour impacts reflect startup, transient, or combustor tuning activities, and all other impacts reflect the impacts during normal steady-state operation.

The modeled impacts are extremely conservative, since the maximum impacts are evaluated under a combination of highest allowable emission rates and the most extreme meteorological conditions, which are unlikely to occur simultaneously with the highest background levels. Emissions rates are shown in **Air Quality Table 12** to **Air Quality Table 14**. The predicted maximum concentrations of criteria pollutants are summarized in **Air Quality Table 17**. PM10 and PM2.5 values are shown in **bold** because they exceed ambient air quality standards due to high background levels.

Air Quality Table 17
OGS, Routine Operation Maximum Impacts (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	4.2	**78.2**	**82.4**	50	**165**
	Annual	0.5	**23.6**	**24.1**	20	**120**
PM2.5	24 hour	4.2	**60.3**	**64.5**	35	**184**
	Annual	0.5	9.3	9.8	12	81
CO	1 hour	763.0	6,440	7,203.0	23,000	31
	8 hour	95.0	1,667	1,762.0	10,000	18
NO_2 [a]	1 hr State	154.7	105.7	260.3	339	77
	1 hr Federal	--paired--	--paired--	136.9	188	73
	Annual	0.4	20.9	21.3	57	37
SO_2	1 hr State	10.1	123.1	133.2	655	20
	1 hr Federal	10.1	122.8	132.9	196	68
	24 hour	2.00	21	23.0	105	22

Source: AFC Supplement Table 5.1-19 (CH2MHILL2010d).
Note: a. The maximum 1-hour NO_2 concentration is based on staff AERMOD PVMRM output, and the ambient ratio method (ARM) is applied for annual NO_2, using national default 0.75 ratio. NO_2 impacts do not show the effects of occasional emergency fire pump engine testing. For a 30-minute test of the fire pump engine, maximum impacts caused by the fire pump engine would be approximately: 86 µg/m^3 1-hour NO_2 without background, at the OGS fence-line.

The maximum 24-hour PM10/PM2.5 impact due to OGS occurs about 1,600 feet (500 meters) southeast of the proposed combustion turbines, in the largely undeveloped and flat terrain north of Highway 4 and west of Big Break Road. Because of the high exhaust temperature and velocity, project impacts (in addition to the background concentration) would be about one-half the maximum level (or less than 2.2 µg/m^3) for the nearest residences at 900 feet (275 meters) southwest of the site and 2,350 feet (720 meters) east of the site. For all other nearby residences, including those approximately 3,280 feet (1,000 meters) northeast of the project boundary near Big Break Marina and those east of Big Break Road, the highest modeled impacts of PM10/PM2.5 would be less than 4% (2 µg/m^3) of the limiting standard (50 µg/m^3) and less than 3% of the background. The highest NO_2 impacts occur during startup of the two CTGs and are not substantially influenced by weekly 30-minute testing of the fire water pump engine because they tend to not impact the same downwind locations.

Staff believes that particulate matter emissions from routine operation would cause a significant impact because they will contribute to existing violations of PM10 and PM2.5 ambient air quality standards. Significant secondary impacts would also occur for PM10, PM2.5, and ozone because operational emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would contribute to existing violations of these standards. The direct impacts of NO_2, in conjunction with worst-case background conditions, would not create a new violation of the NO_2 ambient air quality standards. The direct impacts of CO and SO_2 would not be significant because routine operation of the project would neither cause nor contribute to a violation of these standards. Mitigation should be provided for emissions of PM10, PM2.5, SOx, NOx, and VOC to reduce PM10, PM2.5, and ozone impacts.

Secondary Pollutant Impacts

The project's gaseous emissions of NOx, SOx, VOC, and ammonia are precursor pollutants that can contribute to the formation of secondary pollutants, including ozone, PM10, and PM2.5. Gas-to-particulate conversion in ambient air involves complex chemical and physical processes that depend on many factors, including local humidity, pollutant travel time, and the presence of other compounds. Currently, there are no agency-recommended models or procedures for estimating ozone or particulate nitrate or sulfate formation from a single project or source. However, because of the known relationships of NOx and VOC to ozone and of NOx, SOx, and ammonia emissions to secondary PM10 and PM2.5 formation, unmitigated emissions of these pollutants would likely contribute to higher ozone and PM10/PM2.5 levels in the region. Significant impacts of ozone and PM10/PM2.5 precursors would be mitigated with offsets that would be provided under a recommended condition of certification (**AQ-SC7**).

Ammonia (NH_3) is a particulate precursor but not a criteria pollutant. Reactive with sulfur and nitrogen compounds, ammonia is abundant in the Bay Area due to natural sources and as a byproduct of tailpipe controls on motor vehicles. Studies ongoing by the BAAQMD are exploring the relationship of the ammonia emission inventory to ambient particulate levels, with a preliminary indication that restricting ammonia emissions could be a useful part of a regional strategy to reduce particulate matter formation (PDOC, p. 31, BAAQMD 2010). Restricting ammonia emissions from new sources would also be likely to reduce potential deposition of nitrogen-containing compounds on nearby soils and vegetation (discussed in **Biological Resources**). With sulfuric and nitric acid availability being a key component of particulate matter formation, minimizing and offsetting SOx and NOx emissions would avoid PM10/PM2.5 impacts and reduce secondary pollutant impacts to a less than significant level.

Ammonia emissions are not restricted by the Bay Area Air Quality Management District except for avoiding excessive health risks. Energy Commission staff recommends limiting ammonia slip emissions to the extent feasible to avoid unnecessary ammonia emissions, consistent with staff policy to reduce emissions of all nonattainment pollutant precursors to the lowest feasible levels. The feasibility of reducing ammonia slip depends on the power plant technology, the design of the NOx control system, the expected operating profile, and the cost-effectiveness. Generally, levels of 5 ppmvd can be achieved by combined-cycle power plants, during steady operations with a sufficiently designed catalyst and ammonia injection system (ARB 1999). This level is

considered by staff to be the achievable performance standard to avoid unnecessarily high levels of ammonia emissions, and it would be required by the Bay Area Air Quality Management District's determination of compliance (**AQ-16**, BAAQMD 2010).

Fumigation Impacts

There is the potential that higher short-term concentrations of pollutants may occur during fumigation conditions. Fumigation conditions are generally short-term in nature and only compared to standards of 24 hours or shorter. The applicant analyzed the air quality impacts under shoreline fumigation conditions and thermal inversion breakup conditions.

Shoreline fumigation occurs when dense, cool air over water moves onshore and falls, displacing warmer, lighter air over land. The surface and the air over land both tend to heat and cool more rapidly than over water. During an inland sea breeze, the unstable air over land gradually increases in depth with inland distance. The boundary between the stable air over the water and the unstable air over the land and the wind speed determine if a plume is likely to cross from the stable cooler air and cause elevated ground-level concentrations on the land.

Thermal inversion breakup fumigation occurs when a stable layer of air lies a short distance above the release point of a plume and unstable air lies below. Under these conditions, an exhaust plume may be drawn to the ground, causing high ground-level pollutant concentrations.

The analysis of fumigation impacts considers the maximum allowable hourly emissions from the combination of both CTGs simultaneously under any mode of routine operation using the SCREEN3 Model (version 96043) (CH2MHILL2010d). The maximum impacts under shoreline fumigation conditions would occur during startups at approximately 2.2 km from the project site, and the maximum impacts under inversion breakup fumigation conditions would occur more than 16 km away. These short-term fumigation impacts for NO_2 (which are not adjusted downward by the OLM) shown in **Air Quality Table 18** would be higher than the impacts under routine operation, but the fumigation impacts would not create any new violation of the limiting standard.

Air Quality Table 18
OGS, Maximum Impacts During Shoreline Fumigation (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
CO	1 hour	700	6,440	7,140	23,000	31
NO_2	1 hour	195.3	105.7	301.0	339	89
SO_2	1 hour	14.6	123.1	137.7	655	21

Source: AFC Supplement Table 5.1-23 and 5.1-24 (CH2MHILL2010d).

Commissioning-Phase Impacts

Commissioning impacts would occur over short-term periods within a window of 90 days allowed for completing the commissioning period (**AQ-10**, BAAQMD 2010). The commissioning emissions estimates are based on partial load operations before the emission control systems become operational, as shown in **Air Quality Table 11**.

Impacts due to PM10, PM2.5, and SO_2 during commissioning would occur under similar exhaust conditions as those for startup while in routine operation because these emissions are proportional to fuel use. Commissioning of OGS could involve simultaneous routine operation of one CTG while the second undergoes commissioning tests. Modeling results are based on the applicant's prediction that two CTGs would not undergo uncontrolled commissioning tests simultaneously (AFC Table 5.1B-4B, CH2MHILL 2010d). The CTGs would be limited so that they do not operate with uncontrolled emissions simultaneously during any phase of commissioning through a staff-recommended Condition of Certification (**AQ-SC9**).

Air Quality Table 19 shows that under this condition the commissioning-phase impacts of CO and NO_2 would be somewhat higher than those during routine operations. However, these impacts would not create any new violation of the limiting standards, and they would be limited to only the 90-day window before commercial operation of each CTG. Commissioning-phase impacts to particulate matter and ozone concentrations would be addressed with the mitigation identified above for routine operations.

Air Quality Table 19
OGS, Commissioning-Phase Maximum Impacts (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
CO	1 hour	1,136.0	6,440	7,576	23,000	33
	8 hour	477.0	1,667	2,144	10,000	21
NO_2 [a]	1 hour	198.5	105.7	304.2	339	90

Source: AFC Supplement Table 5.1-19 (CH2MHILL2010d).
Note: a. The maximum 1-hour NO_2 concentration is based on AERMOD OLM output.

Visibility Impacts

A visibility analysis of the project's gaseous emissions would not be required because the OGS project would not qualify as a new major stationary source under the federal Prevention of Significant Deterioration (PSD) permitting program. For projects subject to PSD review by the U.S. EPA, a visibility analysis would address the nearest federally-protected Class I area, which is Point Reyes National Seashore, 86 kilometers (53 miles) away. Due to its distance from Class I areas being nearly 100 kilometers, and due to the potential emissions of the project being less than the PSD applicability thresholds, Energy Commission staff anticipates that the project's impacts to visibility in Class I areas would be insignificant.

Mitigation for Routine Operation

Applicant's Proposed Mitigation

The proposed OGS would mitigate air quality impacts by limiting emissions to the maximum extent feasible with the Best Available Control Technology and by providing emission reduction credits to offset emissions. The equipment description, equipment operation, and proposed emission control devices are provided in **Air Quality Project Description**.

Emission Controls

The combustion turbine generators at OGS would include a dry low-NOx burner system and two catalyst systems: the SCR to reduce NOx; and the oxidation catalyst system to reduce CO and VOC. Operating exclusively with pipeline quality natural gas limits SOx and particulate matter emissions. Additionally, inlet air filters and inlet air cooler drift eliminators would be used to minimize particulate emissions.

Emission Offsets

In addition to emission control strategies included in the project design, OGS proposes to provide offsets in the form of emission reduction credits (ERCs). BAAQMD Rule 2-2-302 requires OGS to provide emission reduction credits to offset the new emissions of NOx and VOC (also known as POC).

The original AFC describes the proposed strategy of providing emission reduction credits to offset operational emissions. The AFC and supplemental filings, however, do not demonstrate that OGS has sufficient holdings of ERCs to offset the proposed emission increases of NOx, VOC, SO_2, and PM10/PM2.5.

Air Quality Table 20 summarizes the BAAQMD Rule 2-2-302 offset requirements for the OGS (including the mandatory NOx offset ratio of 1.15-to-1); however, there are no offsets identified by OGS.

Air Quality Table 20
OGS, BAAQMD Offset Requirements and OGS Offset Holdings (tpy)

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Total Two CTGs Maximum Annual	98.626	29.274	63.715	98.000	12.524
Auxiliary Boiler	0.099	0.217	0.060	0.803	0.024
Diesel Fire Water Pump Engine	0.057	0.003	0.003	0.015	0.0001
Evaporative Inlet Air Cooler	--	--	0.099	--	--
Oil Water Separator	--	0.105	--	--	--
OGS Potential to Emit	**98.78**	**29.60**	**63.88**	**98.82**	**12.55**
Offset Requirements					
BAAQMD Offset Requirements	113.60 [a]	29.49 [b]	0 [c]	0 [d]	0 [e]
OGS Offset Holdings Certificate, Site of Reduction					
None	0	0	0	0	0
OGS Mitigation Total	**0**	**0**	**0**	**0**	**0**
Staff Recommended Mitigation for CEQA Only	**98.78**	**29.60**	**63.88**	**---**	**12.55**
Fully Offset?	**No**	**No**	**No**	**---**	**No**

Source: Independent staff assessment; PDOC, p 65 (BAAQMD 2010).
Notes:
a. BAAQMD offset requirements for NOx for OGS include an offset ratio of 1.15-to-1. In BAAQMD, VOC (POC) offsets may be used to offset emission increases of NOx.
b. BAAQMD offset requirements for VOC (POC) for OGS are at a ratio of 1-to-1. The fire water pump engine and oil water separator are exempt from BAAQMD offset requirements, but it would be offset with staff recommended mitigation.
c. Offsets are not required by BAAQMD for PM10 or PM2.5 since OGS would not exceed 100 tons per year.
d. Offset are not required by BAAQMD for CO since the area is designated as an area that attains the CO ambient air quality standards and OGS would not be subject to PSD review for CO. This Staff Assessment demonstrates that OGS would not cause or contribute to a violation of the CO ambient air quality standards.
e. Offsets are not required by BAAQMD for SO_2 since OGS would not exceed 100 tons per year.

Emission Offsets for Ozone Impact

Air Quality Table 20 summarizes NOx and VOC offset requirements established by the BAAQMD. To satisfy the local air district offset requirements, OGS would need to surrender more than 143 tons per year of NOx and VOC combined offsets. Both NOx and VOC emissions are recognized precursors to the formation of ambient ozone, and NOx is also a recognized precursor to the formation of the nitrate fraction of fine particulate matter. OGS expects to comply with BAAQMD's NOx and VOC offset requirements, which means that it would eventually provide overall total ERCs of more than 143 tons per year for the proposed ozone precursor emissions. This level would be sufficient to demonstrate CEQA mitigation at an offset ratio of at least one-to-one. This would satisfy the CEQA mitigation requirements for ozone impacts as established by Energy Commission staff in recent fossil fuel-fired power plant cases, such as the Marsh Landing Generating Station (09-AFC-3). However, OGS has yet to identify these offsets.

Emission Offsets for Particulate Matter Impact

Air Quality Table 20 shows that the BAAQMD would not require offsets for particulate matter or SOx, which is a recognized precursor to the formation of the sulfate fraction of fine particulate matter. Purchasing and surrendering ERCs for PM10 or SO_2 would be one optional approach for offsetting the impact, if OGS demonstrates control of

sufficient PM10 or SO_2 ERCs. OGS would need to surrender at least 76.4 tons per year of PM10 and SO_2 combined ERCs. Aside from surrendering ERCs, certain emission-reduction programs may be funded by OGS to achieve reductions from non-traditional sources (i.e., routinely exempt or non-stationary sources).

OGS identifies a number of optional programs and the various cost-effectiveness data, including the Carl Moyer Program and wood-burning device retrofitting that could be used (GB 2010i). OGS has an agreement committing OGS financially to implementing a mix of programs for offsetting and abatement of particulate matter, with an emphasis of achieving reductions in and near the City of Oakley, up to a cost of $2,500,000 (City of Oakley letter to OGS dated April 7, 2010, Regarding: Cooperation and Community Benefits Agreement; Docket 09-AFC-4: tn 58810). Highly cost-effective programs, such as the Carl Moyer Program, can achieve reductions at a cost as low as $19,200 per ton including administration fees (GB 2010i), although Carl Moyer Program focuses on NOx rather than PM10. The cost data indicates that $2,500,000 could be sufficient to provide about 130 tons per year of ozone or particulate matter precursor reductions (i.e., NOx) through the Carl Moyer Program.

However, OGS has not identified its preferred approach, and information demonstrating that the emission reductions can be feasibly achieved in the targeted quantities remains missing. At this point in the review of the case, OGS has failed to identify any offset holdings or specific approaches for mitigating the particulate matter impacts. The AFC and public records available from the BAAQMD show the numerous PM10 and SO_2 ERCs held by other entities in the BAAQMD, and OGS may eventually opt to acquire the necessary quantity of these.

Although OGS would satisfy the local air district requirements without surrendering any PM10 or SO_2 offsets, the absence of a feasible and specific approach to achieve reductions for PM10/PM2.5 impacts may result in OGS causing a net increase of these pollutants. Providing overall total PM10 and SO_2 ERCs for the proposed PM10/PM2.5 plus SOx emissions at an offset ratio of at least one-to-one would satisfy the CEQA mitigation requirements for particulate matter impacts.

Adequacy of Proposed Mitigation

Energy Commission staff have long held that emission reductions need to be provided for all nonattainment pollutants and their precursors at a minimum overall one-to-one ratio of annual operating emissions. For this project, the BAAQMD's offset requirements for ozone would meet or exceed that minimum offsetting goal, while staff recommended mitigation for particulate matter impacts would exceed the BAAQMD's requirements (**Air Quality Table 20**). Staff proposes mitigation to ensure that all nonattainment pollutant and precursor emissions are offset by at least one-to-one.

Staff must receive a public filing of the proposed offset package from OGS, including a feasible and specific approach for achieving the necessary reductions before staff can evaluate the adequacy of the proposed emissions offsets for CEQA purposes. The BAAQMD requires that reductions needed to meet their NSR requirements can be provided any time before they issue the Authority to Construct, which is issued after the

Energy Commission final decision, but Energy Commission staff need this information before concluding that the project would be likely to comply with all LORS and CEQA requirements.

Staff Proposed Mitigation

As required by Public Resources Code Section 25523, the Energy Commission shall require that the applicant obtain all necessary emission offsets within the time required by the applicable district rules, consistent with any applicable federal and state laws and regulations, and prior to the commencement of the operation of the proposed facility. Staff aims to demonstrate that OGS has a feasible offset and mitigation approach before making a conclusion that this project would not result in significant air quality-related impacts.

Staff proposes Condition of Certification **AQ-SC6** to ensure that, if needed, the license would be amended as necessary to incorporate future changes to the air quality permits. Staff recommends a Condition of Certification (**AQ-SC7**) to ensure that significant impacts of ozone and PM10/PM2.5 precursors would be mitigated with a sufficient quantity of BAAQMD offsets as specified by staff and to ensure agency consultation if substitutions are made to the proposed emission reduction credits.

Staff also proposes mitigation to ensure ongoing compliance during commissioning and routine operation through quarterly reports (**AQ-SC8**).

CUMULATIVE IMPACTS AND MITIGATION

"Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, §15355). Such impacts can be relatively minor and incremental yet still be significant because of the existing environmental background, particularly when considering other closely related past, present, and reasonably foreseeable future projects.

Criteria pollutants have impacts that are usually (though not always) cumulative by their nature. Rarely will a project itself cause a violation of a federal or state criteria pollutant standard. However, many new sources contribute to violations of criteria pollutant standards because of elevated background conditions. Air districts attempt to reduce background criteria pollutant levels by adopting attainment plans, which are multi-faceted programmatic approaches to attainment. Attainment plans typically include new source review requirements that provide offsets and use Best Available Control Technology, combined with more stringent emissions controls on existing sources.

The discussion of cumulative air quality impacts includes the following three analyses:

- a summary of projections for criteria pollutants by the local air quality management district and the programmatic efforts to abate such pollution;
- an analysis of the project's "localized cumulative impacts" caused by direct emissions when combined with other local major emission sources; and
- a discussion of greenhouse gas impacts (in **AIR QUALITY APPENDIX AIR-1**).

SUMMARY OF PROJECTIONS

The federal and California Clean Air Acts direct local air quality management agencies, in this case, ARB and BAAQMD, to implement plans and programs that lead to attainment and maintenance of the ambient air quality standards. New Source Review (NSR) programs for permitting new and modified stationary sources, and other programs for reducing emissions from mobile sources or area-wide sources, are part of the regional air quality management plans. Thus, when a project has been determined to comply with NSR requirements, including obtaining required emissions offsets, the project is determined to also comply with the regional attainment plans, such as those for ozone and particulate matter.

Ozone

- **2010 Clean Air Plan.** The BAAQMD works with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) to assess population, employment, and transportation trends in the region when developing its air pollution control strategies. The California Clean Air Act requires periodically updating Clean Air Plan. This plan updates the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone and to reduce transport of ozone precursors to neighboring air basins. The 2010 Clean Air Plan expands the ozone management effort and provides a control strategy to reduce ozone, particulate matter, air toxics, and greenhouse gases in a single, integrated plan. Studies ongoing by the BAAQMD are exploring the relationship of the ammonia emission inventory to ambient particulate levels, with a preliminary indication that restricting ammonia emissions could be a useful part of a regional strategy to reduce particulate matter formation. The California Clean Air Act does not require a plan to address nonattainment of the state's PM10 or PM2.5 standards, but many of the measures to reduce ozone precursors will also reduce precursors to ambient particulate matter.
- **2001 Ozone Attainment Plan.** This plan was a regional strategy to achieve the federal one-hour ozone standard. Because the federal one-hour ozone standard was subsequently replaced with an eight-hour standard, this plan included measures that became components of the 2005 Ozone Strategy.

BAAQMD rules and regulations specify performance standards, offset requirements, and emission control requirements for all sources. The regulations also include requirements for obtaining Authority to Construct (ATC) permits and subsequent operating permits. These regulations apply to OGS and all projects with stationary sources; they ensure that all projects will be consistent with steps taken to bring the region into attainment. Routinely updating the attainment plans ensure that population, employment, and transportation trends in the region are taken into account. Compliance with BAAQMD rules and regulations ensures that projects will be consistent with the regional air quality management plans.

Particulate Matter

The BAAQMD is currently designated as an attainment area for the federal PM10 standard and was recently designated nonattainment for the federal PM2.5 standard.

The California Clean Air Act does not require any local air district to provide a plan for attaining the state PM10 or PM2.5 standards, so there is no adopted implementation plan for particulate matter. The 2010 Clean Air Plan provides an outline of achieving reductions in particulate matter, but it is not a formal state implementation plan for meeting the federal Clean Air Act Requirements regarding PM2.5. The BAAQMD must prepare and submit to the ARB and U.S. EPA by December 2012 a separate plan demonstrating how the region will comply with the federal PM2.5 standard no later than 2019.

Direct emissions of PM10 and PM2.5 have been gradually increasing and are projected to increase in the air district, but ambient concentrations have not increased over recent years. Because many of the same sources contribute to both ozone and particulate matter, future ozone precursor emission controls should help ensure continued particulate matter improvements (ARB 2009).

In response to state legislation (SB 656), the BAAQMD identified the most readily available, feasible, and cost-effective control measures that could be employed to reduce PM10 and PM2.5 precursor emissions and concentrations. On November 9, 2005, the District issued a final staff report called the Particulate Matter Implementation Schedule. The proposed measures included reducing NOx and POC emissions from internal combustion engines and providing additional outreach and educational resources. Compliance with BAAQMD rules and regulations and implementing mitigation recommended by staff for offsetting PM10/PM2.5 and SOx emissions (**AQ-SC7**) ensures that project PM10/PM2.5 and precursor impacts will be mitigated and consistent with the forecasted BAAQMD trends.

LOCALIZED CUMULATIVE IMPACTS

The combined air quality impacts of the proposed project, neighboring electric generating facilities, and other reasonably foreseeable local projects are presented here. The analysis for localized cumulative impacts depends upon identifying which present and future projects are not included in the background conditions.

Reasonably foreseeable future projects in the area are those that are either currently under construction or in the process of being approved by a local air district or municipality. Projects that have not yet entered the approval process do not normally qualify as “foreseeable” since the detailed information needed to conduct this analysis is not available. Sources that are presently operational are included in the background concentrations. Stationary source projects located up to six miles from the proposed project site usually need to be included in the analysis. Background conditions take into account the effects of non-stationary (mobile and area) sources.

The applicant, in conjunction with Energy Commission staff, identified the following present and proposed sources, along with other existing major electric generating facilities of concern (although they are also included in the background concentrations), for the analysis of localized cumulative impacts (CH2MHILL 2010w):

- Contra Costa Power Plant, Antioch – Existing natural gas fired boilers 9 and 10 stacks: Units 6 and 7.

- Gateway Generating Station, Antioch – Existing power plant with two natural gas-fired combustion turbines paired with heat recovery steam generators.
- Marsh Landing Generating Station, Antioch – Future simple-cycle power plant with four combustion turbines and fuel gas heaters, approved in 2010.
- Pittsburg Power Plant, Pittsburg – Existing natural gas-fired boilers 5, 6, and 7.
- Willow Pass Generating Station, Pittsburg – Proposed power plant with two natural gas-fired combined cycle combustion turbines and one natural gas-fired fuel gas heater. This power plant is under review for possible approval at the Energy Commission.
- Delta Energy Center, Pittsburg – Existing power plant with three combined cycle combustion turbines.
- Los Medanos Energy Center, Pittsburg – Existing power plant with two combined cycle combustion turbines.
- GWF Wilbur Avenue East Power Plant, Antioch – Existing combustion turbines.
- Silgan Containers Manufacturing Corporation, Antioch – Proposed thermal oxidizer modification.
- Ameresco Keller Canyon LLC, Bay Point – Proposed two landfill gas-fired internal combustion engines and one waste gas flare.
- United Spiral Pipe LLC Manufacturing Plant, Pittsburg – Proposed plant welding, cleaning, miscellaneous particulate matter.
- Freedom High School, Oakley – Proposed diesel generator set.
- Additional cumulative sources, non-major, not electric generating facilities identified by applicant (in Table 4 of CH2MHILL 2010w).

The maximum modeled cumulative impacts are presented below in **Air Quality Table 21**. The total impact is conservatively estimated by the maximum modeled impact plus existing maximum background pollutant levels.

Air Quality Table 21
OGS, Ambient Air Quality Impacts from Cumulative Sources (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
PM10	24 hour	**169.0**	**78.2**	**247.2**	50	**494**
	Annual	15.6	**23.6**	**39.2**	20	**196**
PM2.5	24 hour	**169.0**	**60.3**	**229.3**	35	**655**
	Annual	**15.6**	9.3	**24.9**	12	**208**
CO	1 hour	777.0	6,440	7,217	23,000	31
	8 hour	105.0	1,667	1,772	10,000	18
NO_2 [a]	1 hr State	170.2	105.7	275.9	339	81
	1 hr Federal	--paired--	--paired--	136.9	188	73
	Annual	3.9	20.9	24.8	57	43
SO_2	1 hr State	10.8	123.1	133.9	655	20
	1 hr Federal	10.8	122.8	133.6	196	68
	24 hour	2.3	21	23.3	105	22

Source: Supplemental Response to DR23 (CH2MHILL 2010w).
Note: a. The maximum 1-hour NO_2 concentration is based on staff AERMOD PVMRM output, and the ambient ratio method (ARM) is applied for annual NO_2, using national default 0.75 ratio. NO_2 impacts do not show the effects of occasional emergency fire pump engine testing. For a 30-minute test of the fire pump engine, maximum impacts caused by the fire pump engine would be approximately: 86 µg/m^3 1-hour NO_2, without background. The plume from the fire pump engine's exhaust tends to not impact the same locations as the main stack.

Compared with the impacts from the OGS project alone, maximum cumulative impacts caused by the sources in this assessment would be substantially higher for PM10 and PM2.5, and this is because of one cumulative source (BAAQMD Facility #09029), a concrete batch plant, south of Wilbur Avenue and west of Highway 160, about 400 meters west of OGS. The areas impacted by the batch plant are generally confined to the elevated highway, within a radius of 660 feet (200 meters). In the areas of modeled violation for 24-hour PM10/PM2.5, the OGS would contribute less than 1 µg/m^3, which would be less than the federal Significant Impact Level (SIL) for PM10 of 5 µg/m^3, which staff considers to be a suitable level for determining whether the contribution by OGS would be cumulatively considerable. With OGS's contribution to modeled concentrations being below 5 µg/m^3 in the area of modeled exceedance, the local contribution made by OGS would not be cumulatively considerable.

However, because they would contribute to existing violations of the PM10 and PM2.5 ambient air quality standards in the region, staff believes that particulate matter emissions from OGS would be cumulatively considerable. Secondary impacts would also be cumulatively considerable for PM10, PM2.5, and ozone because emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would contribute to existing violations of the PM10, PM2.5, and ozone standards. To address the contribution caused by OGS to cumulative particulate matter and ozone impacts, staff-recommended mitigation would require offsets for all nonattainment pollutants and their precursors at a minimum ratio of one-to-one.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The Preliminary Determination of Compliance (PDOC) for OGS was issued on October 29, 2010 (BAAQMD 2010), and Energy Commission staff provided public comments in a letter to the BAAQMD on December 1, 2010 (CEC 2010), suggesting that the BAAQMD should identify which ERCs would be surrendered to offset ozone precursor emissions. Staff expects a Final Determination of Compliance (FDOC) will be released sometime in January 2011. Compliance with all District Rules and Regulations was demonstrated to the BAAQMD's satisfaction in the PDOC, and the PDOC conditions are presented in the proposed Conditions of Certification of this Preliminary Staff Assessment.

FEDERAL

40 CFR 51, Nonattainment New Source Review. The PDOC includes conditions that would implement the federal nonattainment New Source Review (NSR) permit for OGS. Energy Commission staff cannot determine whether OGS would be likely to comply with the federal NSR requirement to offset ozone precursor emissions, due to OGS's apparent lack of ownership or control of ERCs (CEC 2010). Federal nonattainment NSR rules and regulations for PM2.5 are not yet in place at the local level. Because the applicable interim federal program applies to new sources of PM2.5 emitting greater than 100 tons per year, and OGS PM2.5 emissions would be less than 64 tons per year as shown in **Air Quality Table 14**, OGS is not subject to federal nonattainment NSR for PM2.5 (BAAQMD 2010).

40 CFR 52.21, Prevention of Significant Deterioration (PSD). A PSD permit would not be required for the proposed OGS project because it would be neither a new major source nor a major modification to an existing major source. The PSD program would not apply as long as OGS is subject to federally-enforceable operating limitations, which are included in the BAAQMD's Determination of Compliance. The operating limitations and monitoring of NO_2 and CO emissions (Conditions **AQ-43** and **AQ-44**) avoid the applicability of PSD. Note, there is a separate discussion of applicability of PSD for GHG in **AIR QUALITY APPENDIX AIR-1**. To ensure that OGS promptly amends the Energy Commission license as necessary to incorporate any future changes triggered by BAAQMD or U.S. EPA action related to PSD, staff proposes Condition of Certification **AQ-SC6**.

40 CFR 60, NSPS, Subpart Dc. The auxiliary boiler would be fueled exclusively by natural gas, and therefore would not be subject to emission limits in this standard. However, fuel monitoring requirements apply, and these are reflected in the Condition of Certification **AQ-36**.

40 CFR 60, NSPS, Subpart IIII. The diesel emergency fire water pump engine would be required to meet U.S. EPA Tier 3 standards and the ARB ATCM for stationary compression ignition (17 CCR 93115), and the engine proposed by the applicant would meet these standards.

40 CFR 60, NSPS Subpart KKKK. The two CTGs proposed for OGS would be likely to comply with the applicable emission limits by achieving a NOx emission rate of 2.0 ppmvd over any one-hour period except during startup, shutdown, and combustor tuning.

STATE

OGS has demonstrated that the project would comply with Section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury. Compliance with the PDOC (BAAQMD 2010) and the Energy Commission staff's Conditions of Certification enable staff's affirmative finding.

LOCAL

The Preliminary Determination of Compliance (BAAQMD 2010) summarizes how the proposed OGS project would comply with BAAQMD requirements. Staff expects the BAAQMD to issue a Final Determination of Compliance sometime in January 2011.

BAAQMD Regulation 2-2-302. This rule requires OGS to surrender ERCs to offset ozone precursor emissions. Energy Commission staff commented that the BAAQMD should identify which ERCs would be surrendered to offset ozone precursor emissions. Energy Commission staff is not able to determine whether OGS would be likely to comply with the federal NSR requirement to offset ozone precursor emissions, due to OGS's apparent lack of ownership or control of ERCs (CEC 2010).

FACILITY CLOSURE

Eventually the OGS project will close, and all sources of air emissions will cease. Impacts associated with those emissions would also cease. The only other expected emissions would be construction/demolition emissions from any dismantling activities. Staff recommends that a facility closure plan be submitted to the Energy Commission Compliance Project Manager to demonstrate compliance with all local, state and federal rules and regulations during both closure and demolition.

CONCLUSIONS

- Staff is not able to determine whether the proposed OGS would conform with all applicable federal, state and BAAQMD air quality LORS, or that the proposed OGS project would not result in significant air quality-related impacts.
- Construction impacts would contribute to violations of the ozone, PM10, and PM2.5 ambient air quality standards. Staff recommends Conditions of Certification **AQ-SC1** to **AQ-SC5** to mitigate the project construction-phase impacts to a less than significant level.
- Because OGS has not demonstrated ownership or control of sufficient emissions reductions to offset ozone precursor emissions, staff is not able to determine whether operation of the project would comply with all applicable BAAQMD rules and regulations, including New Source Review and requirements to offset emission increases. The BAAQMD Preliminary Determination of Compliance demonstrates

that the project would comply with Best Available Control Technology (BACT) requirements.

- This Preliminary Staff Assessment reflects the BAAQMD Preliminary Determination of Compliance conditions, from October 2010. These conditions may be modified further when the Final Determination of Compliance is released.
- The project would neither cause new violations of any NO_2, CO, or SO_2 ambient air quality standards nor contribute to existing violations for these pollutants. Therefore, the project's direct NO_2, CO, and SO_2 impacts are less than significant.
- The project NOx and VOC emissions would contribute to existing violations of state and federal ozone ambient air quality standards. The ozone precursor offsets required by BAAQMD and shown in Condition of Certification **AQ-SC7** would mitigate the ozone impact to a less than significant level. However, there is no information in the record indicating that OGS owns or controls the required offsets.
- The project PM10 and PM2.5 emissions and the PM10/PM2.5 precursor emissions of SOx would contribute to the existing violations of state PM10 and state and federal PM2.5 ambient air quality standards. Staff recommends Condition of Certification **AQ-SC7** to ensure that, in conjunction with the offsets required by BAAQMD, additional offsets would be surrendered in sufficient quantities to satisfy Energy Commission staff's longstanding position that all nonattainment pollutant and precursor emissions be offset at least one-to-one. However, there is no information in the record indicating that OGS owns or controls the required offsets.
- Staff recommends Condition of Certification **AQ-SC9** to limit simultaneous uncontrolled commissioning on the two CTGs.
- Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in **AIR QUALITY APPENDIX AIR-1**. The OGS would emit approximately 0.36 metric tonnes of carbon dioxide per megawatt hour (MTCO2/MWh). At these levels, the project would comply with the limits of SB 1368 (Perata, Chapter 598, Statutes of 2006) and the greenhouse gas Emission Performance Standard for base load power plants seeking contracts with California's utilities. The project would be subject to mandatory GHG reporting requirements and any GHG reduction or trading requirements developed by the U.S. EPA and ARB as GHG regulations are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

STAFF-RECOMMENDED CONDITIONS OF CERTIFICATION

Staff proposes the following conditions of certification (identified as the **AQ-SCx** series of conditions) to provide mitigation during construction and operation of the project.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with conditions **AQ-SC3, AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM delegates. The AQCMM and AQCMM delegates shall have full access to all areas of

construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the compliance project manager (CPM).

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval and for consultation with the Oakley City Engineer: the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM delegates. The AQCMM and all delegates must be approved by the CPM before the start of ground disturbance.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide, for approval, an AQCMP that details the steps to be taken and the reporting requirements necessary to ensure compliance with conditions of certification **AQ-SC3**, **AQ-SC4** and **AQ-SC5**.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval and for consultation with the Oakley City Engineer. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. The AQCMP must be approved by the CPM before the start of ground disturbance.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each monthly compliance report (MCR) that demonstrates compliance with the following mitigation measures for purposes of preventing all fugitive dust plumes from leaving the project site and linear facility routes. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a. All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of **AQ-SC4**. The frequency of watering may be either reduced or eliminated during periods of precipitation.

b. No vehicle shall exceed 15 miles per hour within the construction site.

c. The construction site entrances shall be posted with visible speed limit signs.

d. All construction equipment vehicle tires shall be inspected and washed as necessary to be free of dirt prior to entering paved roadways.

e. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

f. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

g. All construction vehicles shall enter the construction site through the

treated entrance roadways unless an alternative route has been submitted to and approved by the CPM.

h. Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.

i. All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

j. At least the first 500 feet of any public roadway exiting from the construction site shall be swept as needed on days when construction activity occurs or on any other day when dirt or run-off from the construction site is visible on the public roadways.

k. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered or treated with appropriate dust suppressant compounds.

l. All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks to provide at least two feet of freeboard.

m. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The project owner shall include in the MCR: (1) a summary of all actions taken to maintain compliance with this condition; (2) copies of any complaints filed with the air district in relation to project construction; and (3) any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes with the potential to be transported off the project site, 200 feet beyond the centerline of the construction of linear facilities, or within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not providing effective mitigation. The AQCMM or delegate shall then implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed.

Step 1: Within 15 minutes of making such a determination, the AQCMM or delegate shall direct more intensive application of the existing mitigation methods.

Step 2: If Step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination, the AQCMM or delegate shall direct implementation of additional methods of dust suppression.

Step 3: If Step 2 specified above fails to result in effective mitigation within one hour of the original determination, the AQCMM or delegate shall direct a temporary shutdown of the activity causing the emissions. The activity shall not restart until the AQCMM or delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMP shall include a section detailing how additional mitigation measures will be accomplished within the specified time limits.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the MCR, a construction mitigation report that demonstrates compliance with the following mitigation measures for purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior CPM notification and approval.

a. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags, issued by the on-site AQCMM, showing that the engine meets the conditions set forth herein.

b. All construction diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless certified by the on-site AQCMM that such engine is not available for a particular item of equipment. This good faith effort shall be documented with signed written correspondence by the appropriate construction contractors, along with documented correspondence with at least two construction equipment rental firms. In the event that a Tier 3 engine is not available for any off-road equipment larger than 50 hp, that equipment shall be equipped with a Tier 2 engine or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 2 levels, unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is “not practical” for the following, as well as other, reasons:

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental

Protection Agency to control the engine in question to Tier 2 equivalent emission levels and either a Tier 1 engine or the highest level of available control is being used; or

2. The construction equipment is intended to be on site for five days or less.

3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not possible.

4. Equipment owned by specialty subcontractors may be granted an exemption, for single equipment items on a case-by-case basis, if it can be demonstrated that extreme financial hardship would occur if the specialty subcontractor had to rent replacement equipment, or if it can be demonstrated that a specialized equipment item is not available by rental.

c. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and the AQCMM demonstrates that one of the following conditions exists:

1. The use of the control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.

2. The control device is causing or is reasonably expected to cause significant engine damage.

3. The control device is causing or is reasonably expected to cause a significant risk to workers or the public.

4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

d. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (b) above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.

e. All diesel heavy construction equipment shall not idle for more than five minutes, to the extent practical.

f. Construction equipment will employ electric motors when feasible.

Verification: The project owner shall include in the MCR: (1) a summary of all actions taken to maintain compliance with this condition; (2) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that the equipment has been properly maintained; and (3) any

other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. EPA, and any revised permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any proposed air permit modification to the CPM within five working days of either: 1) submittal by the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC7 The project owner shall provide emission reductions in the form of offsets or emission reduction credits (ERCs) in the quantities of at least 98.78 tons per year (tpy) NOx, 29.60 tpy VOC, 63.88 tpy PM10/PM2.5, and 12.55 tpy SOx emissions. The project owner shall demonstrate that the reductions are provided in the form required by the Bay Area Air Quality Management District.

The project owner shall surrender the ERCs from among Bay Area Air Quality Management District Certificate Numbers to be shown in the Final Determination of Compliance, or a modified list, as allowed by this condition. If additional ERCs are submitted, the project owner shall submit a modified list including the additional ERCs to the CPM. The project owner shall request CPM approval for any substitutions, modifications, or additions to the listed credits.

The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, and that the requested change(s) will not cause the project to result in a significant environmental impact. The District must also confirm that each requested change is consistent with applicable federal and state laws and regulations.

Verification: The project owner shall submit to the CPM records showing that the project's offset requirements have been met prior to initiating construction. If the CPM approves a substitution or modification to the list of ERCs, the CPM shall file a statement of the approval with the project owner and the Energy Commission docket. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC8 The project owner shall submit to the CPM quarterly operation reports that include operational and emissions information as necessary to demonstrate compliance with the conditions of certification. The quarterly operation report shall specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit quarterly operation reports to the CPM and APCO no later than 30 days following the end of each calendar quarter. This

information shall be maintained on site for a minimum of five years and shall be provided to the CPM and District personnel upon request.

AQ-SC9 The facility shall be operated such that simultaneous commissioning of the two combustion turbines without abatement of nitrogen oxide or carbon monoxide emissions by its SCR system and oxidation catalyst system will not occur. Operation of one combustion turbine during commissioning without abatement shall be limited to times when the second combustion turbine is either non-operational or in compliance with emission limits for routine operation.

Verification: The project owner shall submit a monthly compliance report to the CPM during the commissioning period demonstrating compliance with this condition.

BAAQMD PROPOSED PERMIT CONDITIONS

The following conditions would be applicable to the proposed OGS facility (BAAQMD 2010). This Preliminary Staff Assessment reflects the BAAQMD Preliminary Determination of Compliance conditions, from October 2010, with November 4, 2010 errata. These conditions may be modified further when the Final Determination of Compliance is released. The BAAQMD conditions are grouped as follows:

- **AQ-1** through **AQ-10** apply during the commissioning period.
- **AQ-11** through **AQ-30** apply to the two CTGs with unfired HRSGs (S-1 and S-2) after the commissioning period has ended [Gas Turbine Generator #1 and #2, GE Frame 7FA, Natural Gas-Fired, 213 MW, 2,150 MMBtu/hr (HHV) maximum rated capacity with high-efficiency inlet air filter; abated by A-1 and A-3 Selective Catalytic Reduction System (SCR) and A-2 and A-4 Oxidation Catalyst].
- **AQ-31** through **AQ-38** apply to the auxiliary boiler (S-3) [Natural Gas-Fired, 50.6 MMBtu/hr (HHV) maximum rated capacity (abated by A-5 Oxidation Catalyst if required)].
- **AQ-39** through **AQ-42** apply to the diesel fire water pump engine (S-4) [Fire Pump Diesel Engine, Clarke JW6H-UFAD80, 400 hp, 2.78 MMBtu/hr maximum rated heat input].
- Facility-wide conditions are **AQ-43** to **AQ-50**.

GE 7FA Combined-Cycle Gas Turbines

Applicability:

Conditions of Certification **AQ-1** through **AQ-10** of this condition shall only apply during the commissioning period as defined below. Unless otherwise indicated, **AQ-11** through **AQ-30** of these conditions shall apply after the commissioning period has ended.

Conditions for the Commissioning Period for GE 7FA Gas Turbines (S-1 and S-2)

AQ-1 The owner/operator shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 and S-2 Gas Turbines to the maximum extent possible during the commissioning period. (Basis: BACT, Regulation 2, Rule 2, Section 409)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-2 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall tune the S-1 and S-2 Gas Turbines combustors to minimize the emissions of carbon monoxide and nitrogen oxides. (Basis: BACT, Regulation 2, Rule 2, Section 409)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-3 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the owner/operator shall install, adjust, and operate the A-2 and A-4 Oxidation Catalysts and A-1 and A-3 SCR Systems to minimize the emissions of carbon monoxide and nitrogen oxides from S-1 and S-2 Gas Turbines. (Basis: BACT, Regulation 2, Rule 2, Section 409)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-4 The owner/operator shall submit a plan to the District Engineering Division and the CEC CPM at least four weeks prior to first firing of S-1 and S-2 Gas Turbines describing the procedures to be followed during the commissioning of the gas turbines. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_X combustors, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO_X continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1 and S-2) without abatement by their respective oxidation catalysts and/or SCR Systems. The owner/operator shall not fire any of the Gas Turbines (S-1 or S-2) sooner than 28 days after the District receives the commissioning plan. (Basis: Regulation 2, Rule 2, Section 419)

Verification: The project owner shall submit a commissioning plan to the CPM and APCO for approval at least four weeks prior to first firing of the gas turbine describing the procedures to be followed during the commissioning period and the anticipated duration of each commissioning activity.

AQ-5 During the commissioning period, the owner/operator shall demonstrate compliance with **AQ-7**, **AQ-8**, and **AQ-9** through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters and emission concentrations:
-firing hours
-fuel flow rates

-stack gas nitrogen oxide emission concentrations
-stack gas carbon monoxide emission concentrations
-stack gas oxygen concentrations

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-1 and S-2). The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_X and CO emission concentrations, summarized for each clock hour and each calendar day. The owner/operator shall retain records on site for at least 5 years from the date of entry and make such records available to District personnel upon request. (Basis: Regulation 2, Rule 2, Section 419)

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-4**.

AQ-6 The owner/operator shall install, calibrate, and operate the District-approved continuous monitors specified in **AQ-5** prior to first firing of the Gas Turbines (S-1 and S-2). After first firing of the turbines, the owner/operator shall adjust the detection range of these continuous emission monitors as necessary to accurately measure the resulting range of CO and NO_X emission concentrations. The instruments shall operate at all times of operation of S-1 and S-2 including start-up, shutdown, upset, and malfunction, except as allowed by BAAQMD Regulation 1-522, BAAQMD Manual of Procedures, Volume V. If necessary to comply with this requirement, the owner/operator shall install dual-span monitors. The type, specifications, and location of these monitors shall be subject to District review and approval. (Basis: Regulation 2, Rule 2, Section 419)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission upon request.

AQ-7 The owner/operator shall not fire S-1 and S-2 Gas Turbine without abatement of nitrogen oxide emissions by the corresponding SCR System A-1 and A-3 and/or abatement of carbon monoxide emissions by the corresponding Oxidation Catalyst A-2 and A-4 for more than a combined total of 831 hours during the commissioning period. Such operation of any Gas Turbine (S-1, S-2) without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and/or oxidation catalyst in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Engineering and Enforcement Divisions and the unused balance of the 831 firing hours without abatement shall expire. (Basis: BACT, Regulation 2, Rule 2, Section 409)

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-4**. A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-8 The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM_{10}, and sulfur dioxide that are emitted by the Gas Turbines (S-1, and S-2) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in **AQ-43**. (Basis: Regulation 2, Rule 2, Section 409)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-9 The owner/operator shall not operate the Gas Turbines (S-1 and S-2) in a manner such that the pollutant emissions from each gas turbine will exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1, S-2). (Basis: BACT, Regulation 2, Rule 2, Section 409)

NO_X (as NO_2)	2,380.8 pounds per calendar day	148.7 pounds per hour
CO	13,303 pounds per calendar day	700 pounds per hour

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-10 Within 90 operating days after first fire of each Gas Turbine, the owner/operator shall conduct District- and CEC-approved source tests for that Gas Turbine to determine compliance with the emission limitations specified in **AQ-17**. The source tests shall determine NO_X, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Thirty working days before the execution of the source tests, the owner/operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this Part. The District and the CEC CPM will notify the owner/operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The owner/operator shall incorporate the District and CEC CPM comments into the test plan. The owner/operator shall notify the District and the CEC CPM within seven (7) working days prior to the planned source testing date. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of the source testing date. (Basis: Regulation 2, Rule 2, Section 419)

Verification: The project owner shall submit to the CPM and APCO for approval the commissioning plan as required in **AQ-4**.

Conditions for the GE 7FA Combined-Cycle Gas Turbines (S-1 and S-2)

AQ-11 The owner/operator shall fire the Gas Turbines (S-1 and S-2) exclusively on PUC regulated natural gas with a maximum sulfur content of 1 grain per 100

standard cubic feet. To demonstrate compliance with this limit, the operator of S-1 and S-2 shall sample and analyze the gas from each supply source at least monthly to determine the sulfur content of the gas. PG&E monthly sulfur data may be used provided that such data can be demonstrated to be representative of the gas delivered to the OGS. (Basis: BACT for SO_2 and PM_{10})

Verification: The result of the natural gas fuel sulfur monitoring data and other fuel sulfur content source data shall be submitted to the District and CPM in the quarterly operation report (**AQ-SC8**).

AQ-12 The owner/operator shall not operate the units such that the heat input rate to each Gas Turbine (S-1 and S-2) exceeds 2,150 MMBtu (HHV) per hour. (Basis: BACT for NO_X)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-13 The owner/operator shall not operate the units such that the heat input rate to each Gas Turbine (S-1 and S-2) exceeds 51,600 MMBtu (HHV) per day. (Basis: Cumulative Increase for PM_{10})

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-14 The owner/operator shall not operate the units such that the combined cumulative heat input rate for the Gas Turbines (S-1 and S-2) exceeds 35,397,277 MMBtu (HHV) per year. (Basis: Offsets)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-15 The owner/operator shall ensure that each Gas Turbine (S-1, S-2) is abated by the properly operated and properly maintained Selective Catalytic Reduction (SCR) System A-1 or A-3 and Oxidation Catalyst System A-2 or A-4 whenever fuel is combusted at those sources and the corresponding SCR catalyst bed (A-1 or A-3) has reached minimum operating temperature. (Basis: BACT for NO_X, POC and CO)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission upon request. A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-16 The owner/operator shall ensure that the Gas Turbines (S-1, S-2) comply with the following limits. The limits in this part do not apply during a gas turbine start-up, combustor tuning operation or shutdown. (Basis: BACT and Regulation 2, Rule 5)

a) Nitrogen oxide mass emissions (calculated as NO2) at each exhaust point P-1 and P-2 (exhaust point for S-1 and S-2 Gas Turbine after abatement

by A-1 and A-3 SCR System) shall not exceed 15.52 pounds per hour, averaged over any 1-hour period. (Basis: Cumulative Increase for NOX)

b) The nitrogen oxide emission concentration at each exhaust point P-1 and P-2 shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O2, averaged over any 1-hour period. (Basis: BACT for NOX)

c) Carbon monoxide mass emissions at each exhaust point P-1 and P-2 shall not exceed 9.45 pounds per hour, averaged over any 1-hour period. (Basis: Cumulative Increase for CO)

d) The carbon monoxide emission concentration at each exhaust point P-1 and P-2 shall not exceed 2.0 ppmv, on a dry basis, corrected to 15% O2 averaged over any 1-hour period. (Basis: BACT for CO)

e) Ammonia (NH3) emission concentrations at each exhaust point P-1 and P-2 shall not exceed 5 ppmv, on a dry basis, corrected to 15% O2, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to each SCR System A-1 and A-3. The correlation between the gas turbine heat input rates, A-1 and A-3 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with **AQ-25** or a District approved alternative method. (Basis: Regulation 2, Rule 5)

f) Precursor organic compound (POC) mass emissions (as CH4) at each exhaust point P-1 and P-2 shall not exceed 2.71 pounds per hour.

(Basis: Cumulative Increase for POC)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-17 The owner/operator shall ensure that the regulated air pollutant mass emission rates from each of the Gas Turbines (S-1, and S-2) during a start-up or shutdown does not exceed the limits established below. (Basis: BACT Limit for Non-Steady-State Operation)

Pollutant	Hot/Warm Startup (lb/startup)	Maximum Emissions During an Hour Containing a Hot/Warm Startup (lb/hr)	Maximum Emissions Per Cold Startup (lb/startup)	Maximum Emissions During an Hour Containing a Cold Startup (lb/hr)	Maximum Emissions Per Shutdown (lb/shutdown)	Maximum Emissions During an Hour Containing a Shutdown (lb/hr)
NO_X (as NO_2)	22.3	33.9	96.3	99.9	39.3	46.8
CO	85.2	92.2	360.2	362.4	140.2	144.7
POC (as CH_4)	31.1	33.1	67.1	67.7	17.1	18.4

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-18 The owner/operator shall not perform combustor tuning on each Gas Turbine (S-1 or S-2) more than twice in any consecutive 12 month period. Each tuning event shall not exceed 6 hours. Combustor tuning shall only be performed on one gas turbine per day. The owner/operator shall notify the District no later than 7 days prior to combustor tuning activity. The emissions during combustor tuning from each gas turbine shall not exceed the hourly limits established below, and shall not exceed hourly limits established by the District based on emissions data obtained during the first tuning event for each turbine. The owner/operator shall measure and record mass emissions of NOx and CO using the continuous emission monitors during tuning. The owner/operator shall measure POC emissions during the first tuning after the first turbine has been commissioned using a District-approved source test method. The owner/operator shall submit the record of the NOx, CO, and POC emissions during the first tuning event after the first turbine has been commissioned to the District within 60 days after the first tuning event. The District shall establish mass emissions limits for the future tuning events based on this test data and shall notify the owner/operator of these limits. (Basis: BACT, Offsets, Cumulative Increase)

Pollutant	**Emissions Limit (lb/hr)**
NO_X (as NO_2)	96
CO	360
POC (as CH_4)	67

Verification: The project owner shall notify both the District and CPM at least 7 days prior to the combustor tuning. A summary of significant operation and maintenance

events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-19 The owner/operator shall not allow total emissions from each Gas Turbine (S-1 or S-2), including emissions generated during gas turbine start-ups, and shut-downs to exceed the following limits during any calendar day (except for days during which combustor tuning events occur, which are subject to **AQ-20** below):

a) 488 pounds of NO_X (as NO_2) per day (Basis: Cumulative Increase)

b) 715 pounds of CO per day (Basis: Cumulative Increase)

c) 146 pounds of POC (as CH_4) per day (Basis: Cumulative Increase)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-20 The owner/operator shall not allow total emissions from each Gas Turbine (S-1 or S-2), including emissions generated during gas turbine start-ups, shut-downs, and combustor tuning events to exceed the following limits during any calendar day on which a tuning event occurs:

a) 971 pounds of NO_X (as NO_2) per day (Basis: Cumulative Increase)

b) 2818 pounds of CO per day (Basis: Cumulative Increase)

c) 531 pounds of POC (as CH_4) per day (Basis: Cumulative Increase)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-21 The owner/operator shall not allow the maximum projected annual toxic air contaminant emissions (per **AQ-24**) from the Gas Turbines (S-1, S-2) combined to exceed the following limits:

Formaldehyde	16,636.1 pounds per year
Benzene	462.9 pounds per year
Specified polycyclic aromatic hydrocarbons (PAHs)	4.54 pounds per year

unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment to determine the total facility risk using the emission rates determined by source testing and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. The owner/operator shall submit the risk analysis to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will not result in a significant cancer

risk, the District and the CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (Basis: Regulation 2, Rule 5)

Verification: Source test results obtained through compliance with **AQ-24** and **AQ-28** shall confirm the toxic air contaminant emission rates or the project owner shall submit an updated health risk assessment.

AQ-22 The owner/operator shall demonstrate compliance with **AQ-12** through **AQ-14**, **AQ-16**(a) through **AQ-16**(d), **AQ-17** (NO_X, and CO limits), **AQ-18** (NO_X and CO limits), **AQ-19**(a), **AQ-19**(b), **AQ-20**(a), **AQ-20**(b), **AQ-43**(a) and **AQ-43**(b) by using properly operated and maintained continuous monitors (during all hours of operation including gas turbine start-up, combustor tuning, and shutdown periods). If necessary to comply with this requirement, the owner/operator shall install dual-span monitors. The owner/operator shall monitor for all of the following parameters and record each parameter at least every 15 minutes (excluding normal calibration periods):

a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 and S-2

b) Oxygen (O2) concentration, Nitrogen Oxides (NOX) concentration, and carbon monoxide (CO) concentration at exhaust points P-1 and P-2

c) Ammonia injection rate at A-1 and A-2 SCR Systems

The owner/operator shall use the parameters measured above and District approved calculation methods to calculate and record the following parameters for each gas turbine (S-1 and S-2):

d) Corrected NOX concentration and corrected CO concentration, averaged for each clock hour

e) Corrected NOX concentration and corrected CO concentration, averaged for each calendar day

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate and record the following parameters for each gas turbine (S-1 and S-2) and totaled for S-1 and S-2:

f) For each rolling three hour period, the heat input rate in MMBtu (HHV) per hour

g) For each calendar day, the average hourly heat input rate in MMBtu (HHV) per hour and total daily heat input rate in MMBtu (HHV) per day

h) For each consecutive twelve month period, the total heat input rate in MMBtu (HHV) per year

i) For each clock hour, the NOX mass emission rate (as NO2) and CO mass emissions rate in pounds per hour

j) For each calendar day, the NOX mass emission rate (as NO2) and CO

mass emissions rate in pounds per day

k) For each consecutive 12-month period, the monthly NOX (as NO2) and CO mass emissions rates in pounds per month and annual NOX and CO mass emissions rates in pounds per year and tons per year

(Basis: 1-520.1, 9-9-501, BACT, Offsets, NSPS, Cumulative Increase)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the continuous monitoring and recordkeeping system is properly installed and operational.

AQ-23 To demonstrate compliance with **AQ-16**(f), **AQ-19**(c), **AQ-20**(c), and **AQ-43**(c) the owner/operator shall calculate and record on a daily basis, the precursor organic compound (POC) mass emissions from each power train. The owner/operator shall use the actual heat input rates measured pursuant to **AQ-22**, actual Gas Turbine start-up times, actual Gas Turbine shutdown times, and CEC and District-approved emission factors developed pursuant to source testing under **AQ-26** to calculate these emissions. The owner/operator shall present the calculated emissions in the following format:

a) For each calendar day, POC mass emissions, summarized for each gas turbine and S-1 and S-2 combined

b) For each consecutive 12-month period, the cumulative total POC mass emissions for each gas turbine and S-1 and S-2 combined.

(Basis: Offsets, Cumulative Increase)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the calculation and recordkeeping system is properly installed and operational.

AQ-24 To demonstrate compliance with **AQ-21**, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: Formaldehyde, Benzene, and Specified PAHs. The owner/operator shall calculate the maximum projected annual emissions using the combined maximum annual heat input rate of 35,397,277 MMBtu/year for S-1 and S-2 combined and the highest emission factor (pounds of pollutant per MMBtu of heat input) determined by the most recent of any source test of the S-1 or S-2 Gas Turbines. If the highest emission factor for a given pollutant occurs during minimum-load turbine operation, a reduced annual heat input rate may be utilized to calculate the maximum projected annual emissions to reflect the reduced heat input rates during gas turbine start-up and minimum-load operation. The reduced annual heat input rate shall be subject to District review and approval. (Basis: Regulation 2, Rule 5)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the calculation and recordkeeping system is properly installed and operational.

AQ-25 Within 90 operating days of first fire of each of the OGS GE 7FA units, the owner/operator shall conduct a District-approved source test on each corresponding exhaust point P-1 or P-2 to determine the corrected ammonia (NH_3) emission concentration to determine compliance with **AQ-16**(e). The source test shall determine the correlation between the heat input rates of the gas turbine, A-1 or A-3 SCR System ammonia injection rate, and the corresponding NH_3 emission concentration at emission point P-1 or P-2. The source test shall be conducted over the expected operating range of the turbine (including, but not limited to, minimum and full load modes) to establish the range of ammonia injection rates necessary to achieve NO_X emission reductions while maintaining ammonia slip levels. The owner/operator shall repeat the source testing on an annual basis thereafter. Ongoing compliance with **AQ-16**(e) shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of conducting the tests. (Basis: Regulation 2, Rule 5)

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-27**). Testing for steady-state emissions shall be conducted upon initial operation and at least once every 12 months.

AQ-26 Within 90 operating days of first fire of each of the OGS GE 7FA units and, at a minimum, on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas Turbine is operating at maximum load to determine compliance with **AQ-16**(a), **AQ-16**(b), **AQ-16**(c), **AQ-16**(d), **AQ-16**(f), and to establish the emissions factors to be used to demonstrate compliance with **AQ-43**(d) and **AQ-43**(e); and while each Gas Turbine is operating at minimum load to determine compliance with **AQ-16**(c) and **AQ-16**(d); and to verify the accuracy of the continuous emission monitors required in **AQ-22**. The owner/operator shall test for (as a minimum each year): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO_2), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and PM_{10} emissions including condensable particulate matter. The owner/operator may conduct source tests of individual compounds listed in this part separately. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of conducting the tests. The owner/operator may perform up to four tests per year for PM_{10} emissions including condensable particulate matter. (Basis: BACT, Offsets, Cumulative Increase)

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-27**). Testing for steady-state emissions shall be conducted upon initial operation and at least once every 12 months.

AQ-27 The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CEC CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CEC CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to any measurement of the total particulate matter or PM_{10} emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of conducting the tests. (Basis: BACT, Regulation 2, Rule 2, Section 419)

Verification: The project owner shall submit the proposed source test plan or protocol for the source tests seven days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than seven days prior to the proposed source test date and time.

AQ-28 Within 90 operating days of first fire of the second of the OGS GE 7FA gas turbines and on a biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on one of the following exhaust points P-1 or P-2 while the Gas Turbine is operating at maximum allowable operating rates to demonstrate compliance with **AQ-21**. The owner/operator shall also test the gas turbine while it is operating at minimum load. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to **AQ-24** for any of the compounds are less than 50% of the levels listed in **AQ-21**, then the owner/operator may discontinue future testing for that pollutant. (Basis: Regulation 2, Rule 5)

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-27**). Testing for toxic air contaminant emissions shall be conducted upon initial operation and at least once every 24 months.

AQ-29 Within 90 days of start-up of each of the OGS GE 7FA gas turbines and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on one of the two exhaust points P-1 or P-2 while the gas turbine is operating at maximum heat input rate to demonstrate compliance with the total sulfuric acid mist emission rate for S-1 and S-2 of 6.3 tons per year. The owner/operator shall test for (as a minimum) SO_2, SO_3, and H_2SO_4, and the sulfur content of the fuel. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of conducting the tests. (Basis: Regulation 2, Rule 5)

Verification: The results and field data collected during source tests shall be submitted to the District and CPM within 60 days of testing and according to a pre-approved protocol (**AQ-27**). Testing for steady-state emissions shall be conducted upon initial operation and at least once every 12 months.

AQ-30 The owner/operator shall ensure that the stack height of emission points P-1 and P-2 is each at least 155.5 feet above grade level at the stack base. (Basis: Regulation 2, Rule 5)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission.

Auxiliary Boiler (S-3)

AQ-31 The owner/operator shall submit manufacturer's specifications and emissions guarantees for NO_x and CO for the Auxiliary Boiler (S-3) to the District Engineering Division and the CEC CPM at least four weeks prior to first firing of Auxiliary Boiler (S-3). (Basis: Regulation 2, Rule 2, Section 419)

Verification: At least thirty (30) days prior to the installation of the Auxiliary Boiler, the project owner shall provide the District and the CPM the specifications for the boiler.

AQ-32 If Oxidation Catalyst (A-5) is required, the owner/operator shall install, adjust, and operate the A-5 Oxidation Catalyst at the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturers and the construction contractor, to minimize the emissions of carbon monoxide from S-3 Auxiliary Boiler. (Basis: Regulation 2, Rule 2, Section 419)

Verification: The project owner shall make the site available for inspection of equipment and records by representatives of the District, ARB, and the Energy Commission.

AQ-33 The heat input rate to the Auxiliary Boiler (S-3) shall not exceed 50.6 MMBtu per hour, averaged over any rolling 3-hour period. (Basis: Cumulative Increase)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-34 The heat input rate to the Auxiliary Boiler (S-3) shall not exceed 218,606 MMBtu per year. (Basis: Cumulative Increase)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-35 The owner/operator of the Auxiliary Boiler (S-3) shall meet all of the requirements listed in below.

a) Nitrogen oxide emissions at P-3 (the exhaust point for the Auxiliary Boiler) shall not exceed 9.8 pounds per day, calculated as NO2. (Basis: Regulation 2-1-403)

b) Carbon monoxide emissions at P-3 shall not exceed 9.8 pounds per day. (Basis: Regulation 2-1-403)

c) POC emissions (as CH_4) at P-3 shall not exceed 2.8 pounds per day.

(Basis: Regulation 2-1-403)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-36 The owner/operator shall demonstrate compliance with **AQ-35**(a), **AQ-35**(b) and **AQ-43**(a) and **AQ-43**(b) by using properly operated and maintained continuous monitors (during all hours of operation including auxiliary boiler start-up, tuning, and shutdown periods). The owner/operator shall monitor for all of the following parameters and record each parameter at least every 15 minutes (excluding normal calibration periods):

a) Firing Hours and Fuel Flow Rates

b) Oxygen (O2) concentration, Nitrogen Oxides (NOX) concentration, and carbon monoxide (CO) concentration at exhaust point P-3

The owner/operator shall use the parameters measured above and District approved calculation methods to calculate and record the following parameters for the Auxiliary Boiler (S-3):

c) Corrected NOX concentration and corrected CO concentration, averaged for each clock hour

d) Corrected NOX concentration and corrected CO concentration, averaged for each calendar day

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate and record the following parameters for Auxiliary Boiler (S-3):

e) For each rolling three hour period, the heat input rate in MMBtu (HHV) per hour

f) For each calendar day, the average hourly heat input rate in MMBtu (HHV) per hour and total daily heat input rate in MMBtu (HHV) per day

g) For each consecutive twelve month period, the total heat input rate in MMBtu (HHV) per year

h) For each clock hour, the NOX mass emission rate (as NO2) and CO mass emissions rate in pounds per hour

i) For each calendar day, the NOX mass emission rate (as NO2) and CO mass emissions rate in pounds per day

j) For each consecutive 12-month period, the monthly NOX (as NO2) and CO mass emissions rates in pounds per month and annual NOX (as NO2) and CO mass emissions rates in pounds per year and tons per year

(Basis: 1-520.1, 9-7-307, BACT, Offsets, Cumulative Increase)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the monitoring and recordkeeping system is properly installed and operational.

AQ-37 To demonstrate compliance with **AQ-35**(c) the owner/operator shall calculate and record on a daily basis, the precursor organic compound (POC) mass emissions from the auxiliary boiler. The owner/operator shall use the actual heat input rates measured pursuant to **AQ-36**, and CEC and District-approved emission factors developed pursuant to source testing under **AQ-38** to calculate these emissions. The owner/operator shall present the calculated emissions in the following format:

a) For each calendar day, POC mass emissions, summarized for S-3

b) For each consecutive 12-month period, the cumulative total POC mass emissions for S-3.

(Basis: Offsets, Cumulative Increase)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the calculation and recordkeeping system is properly installed and operational.

AQ-38 Within 90 operating days after first fire of Auxiliary Boiler (S-3), the owner/operator shall conduct a District-approved source test on exhaust point P-3 while the auxiliary boiler is operating at maximum load to determine emission factors for POC, PM_{10} and SO_x. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass emissions, nitrogen oxide concentration and mass emissions (as NO_2), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and PM_{10} emissions including condensable particulate matter. Thirty working days before the execution of the source tests, the owner/operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this Part. The District and the CEC CPM will notify the owner/operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The owner/operator shall incorporate the District and CEC CPM comments into the test plan. The owner/operator shall notify the District and the CEC CPM within seven (7) working days prior to the planned source testing date. The owner/operator shall submit the source test results to the District and the CEC CPM within 60 days of the source testing date. (Basis: Regulation 2, Rule 2, Section 419)

Verification: The project owner shall submit for approval, the source test plan to the District and CPM, thirty (30) working days before the execution of the compliance test required in this condition. The test results shall be submitted to the District and to the CPM within sixty (60) days of the source testing date.

Conditions for the Fire Pump Diesel Engine (S-4)

AQ-39 The owner/operator shall fire the Fire Pump Diesel Engine (S-4) exclusively on diesel fuel having a sulfur content no greater than 0.0015% by weight. (Regulation 2, Rule 5, Cumulative Increase, "Stationary Diesel Engine ATCM", CA Code of Regulations, Title 17, Section 93115.5(a))

Verification: The project owner shall make the site available for inspection of equipment and fuel purchase records by representatives of the District, ARB, and the Energy Commission.

AQ-40 The owner/operator shall operate the Fire Pump Diesel Engine (S-4) for no more than 49 hours per year for the purpose of reliability testing and non-emergency operation. (Regulation 2, Rule 5, Cumulative Increase, "Stationary Diesel Engine ATCM", CA Code of Regulations, Title 17, Section 93115.6(a)(4)(A))

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-41 The owner/operator shall operate the Fire Pump Diesel Engine (S-4) only when a non-resettable totalizing hour meter (with a minimum display capability of 9,999 hours) is installed, operated and properly maintained. (Basis: BAAQMD Regulation 9-8-530, "Stationary Diesel Engine ATCM", CA Code of Regulations, Title 17, Section 93115.10(e)(1))

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Energy Commission. The project owner shall include a photograph of each totalizing meter in the quarterly operation report (**AQ-**SC8).

AQ-42 The owner/operator shall maintain the following monthly records for Fire Pump Engine (S-4) in a District-approved log for at least 5 years.

a. Hours of operation for reliability-related activities (maintenance and testing).

b. Hours of operation for emission testing to show compliance with emission limits.

c. Hours of operation for emergency use.

d. For each emergency, the nature of the emergency condition.

e. Fuel usage.

Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request. (Basis: BAAQMD Regulation 9-8-530, "Stationary Diesel Engine ATCM", CA Code of Regulations, Title 17, Section 93115.10(g))

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission.

Conditions for the Combined-Cycle Gas Turbines (S-1 and S-2), Auxiliary Boiler (S-3), and Fire Pump Engine (S-4)

AQ-43 The owner/operator shall not allow total combined emissions from the Gas Turbines (S-1 and S-2), including emissions generated during gas turbine start-ups, combustor tuning, shutdowns, and malfunctions, the auxiliary boiler (S-3), including emissions generated during auxiliary boiler start-ups, tune-ups, shutdowns, and malfunctions, and the fire pump diesel engine (S-4), including non-emergency and emergency operation, to exceed the following limits during any consecutive twelve-month period:

a) 98.78 tons of NOx (as NO2) (Basis: Offsets)

b) 98.82 tons of CO (Basis: Cumulative Increase)

c) 29.49 tons of POC (as CH4) (Basis: Offsets)

d) 63.78 tons of PM10 (Basis: Cumulative Increase)

e) 12.55 tons of SO2 (Basis: Cumulative Increase)

Compliance with the limits in this part shall be determined using the following procedures:

Emissions of PM10 and SO_2 from each gas turbine shall be calculated by multiplying turbine fuel usage times an emission factor determined by source testing of the turbine conducted in accordance with **AQ-26**. The emission factor for each turbine shall be based on the average of the emissions rates observed during the 4 most recent source tests on that turbine (or, prior to the completion of 4 source tests on a turbine, on the average of the emission rates observed during all source tests on the turbine).

Emissions of PM10, SO_2, and POC from the auxiliary boiler shall be calculated by multiplying auxiliary boiler fuel usage times an emission factor determined by source testing of the auxiliary boiler conducted in accordance with **AQ-38**.

The owner/operator shall calculate emissions from the fire pump diesel engine from the hours of operation recorded in **AQ-42** and the following emission factors:

NO_x: 2.62 g/hp-hr

CO: 0.67 g/hp-hr

POC: 0.14 g/hp-hr

PM: 0.119 g/hp-hr

SO_x: 0.004 g/hp-hr

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-44 To demonstrate compliance with **AQ-43**, the owner/operator shall record the total emissions for each consecutive 12-month period. The owner/operator shall calculate emissions of each pollutant listed in **AQ-43**(a) through (e) from the gas turbines, auxiliary boiler, and fire pump diesel engine for each calendar month using the calculation procedures established in **AQ-43**, and shall calculate annual emissions to determine compliance with the limits listed in **AQ-43**(a) through (e) by summing the monthly totals for the previous 12 months. (Basis: Regulation 2, Rule 2, Section 419)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission to verify the calculation and recordkeeping system is properly installed and operational.

AQ-45 The owner/operator shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Basis: Regulation 2, Rule 1, Section 403)

Verification: The project owner shall ensure that notifications and reports, including the quarterly operation report (**AQ-SC8**), are prepared and submitted in compliance with this condition.

AQ-46 The owner/operator shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Basis: Regulation 2, Rule 1, Section 403, Regulation 2, Rule 6, Section 501)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission.

AQ-47 The owner/operator shall notify the District and the CEC CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Basis: Regulation 2, Rule 1, Section 403)

Verification: A summary of significant operation and maintenance events and monitoring records required shall be included in the quarterly operation report (**AQ-SC8**).

AQ-48 The owner/operator shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and config-

uration of the stack sampling ports shall comply with the District Manual of Procedures, Volume IV, Source Test Policy and Procedures, and shall be subject to BAAQMD review and approval, except that the facility shall provide four sampling ports that are at least 6 inches in diameter in the same plane of each gas turbine stack (P-1, P-2). (Basis: Regulation 1, Section 501)

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB and the Commission.

AQ-49 Within 180 days of the issuance of the Authority to Construct for the OGS, the owner/operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous emission monitors, sampling ports, platforms, and source tests required by **AQ-10**, **AQ-25**, **AQ-26**, **AQ-28**, **AQ-29**, and **AQ-38**. The owner/operator shall conduct all source testing and monitoring in accordance with the District approved procedures. (Basis: Regulation 1, Section 501)

Verification: The project owner shall contact the District for specifications on monitors, ports, platforms and source tests and shall submit verification of this contact to the District and CPM with the initial source test protocol (**AQ-27**).

AQ-50 The owner/operator shall ensure that the OGS complies with the continuous emission monitoring requirements of 40 CFR Part 75. (Basis: Regulation 2, Rule 7)

Verification: The project owner shall submit to the CPM and District the results of audits of the monitoring system demonstrating compliance with this condition as part of the quarterly operation report (**AQ-SC8**).

DEFINITIONS

Hour:	Any continuous 60-minute period
Clock Hour:	Any continuous 60-minute period beginning on the hour
Calendar Day:	Any continuous 24-hour period beginning at 12:00 midnight or 0000 hours
Year:	Any consecutive twelve-month period of time
Rolling 3-hour period:	Any consecutive three-clock hour period, not including start-up or shutdown periods
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in hours
MMBtu:	million British thermal units
Gas Turbine Cold Start-up	A gas turbine startup that occurs more than 48 hours after a gas turbine shutdown, and is limited in time to the lesser of (i) the first 90 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or (ii) the period of

time from Gas Turbine fuel flow initiation until the Gas Turbine achieves the first of two consecutive CEM data points in compliance with the emission concentration limits of **AQ-16**(b) and **AQ-16**(d)

Gas Turbine Hot/Warm Start-up: A gas turbine startup that occurs within 48 hours of a gas turbine shutdown, and is limited in time to the lesser of (i) the first 30 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or (ii) the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves the first of two consecutive CEM data points in compliance with the emission concentration limits of **AQ-16**(b) and **AQ-16**(d)

Gas Turbine Shutdown: The lesser of the 30-minute period immediately prior to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in **AQ-16**(b) and **AQ-16**(d) until termination of fuel flow to the Gas Turbine

Gas Turbine Combustor Tuning: The period of time, not to exceed 6 operating hours per tuning event, in which testing, adjustment, tuning, and calibration operations are performed, as recommended by the gas turbine manufacturer, to ensure safe and reliable steady-state operation, and to minimize NO_X and CO emissions.

Specified PAHs: The polycyclic aromatic hydrocarbons listed below shall be considered to be Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds:

Benzo[a]anthracene
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[a]pyrene
Dibenzo[a,h]anthracene
Indeno[1,2,3-cd]pyrene

Corrected Concentration: The concentration of any pollutant (generally NO_X, CO, or NH_3) corrected to a standard stack gas oxygen concentration. For emission points P-1, the exhaust of Gas Turbine (S-1), and P-2, the exhaust of Gas Turbine (S-2), the standard stack gas oxygen concentration is 15% O_2 by volume on a dry basis. For emission point P-3, the exhaust of Auxiliary Boiler (S-3), the standard stack gas oxygen concentration is 3% O_2 by volume on a dry basis.

Commissioning Activities: All testing, adjustment, tuning, and calibration activities recommended by the equipment manufacturers and the OGS construction contractor to ensure safe and reliable steady-state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated elec-

	trical delivery systems during the commissioning period
Commissioning Period:	The Commissioning Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The Commissioning Period shall terminate when the plant has completed performance and emissions testing.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CEC CPM:	California Energy Commission Compliance Program Manager
OGS:	Oakley Generating Station
Owner/operator:	The owner/operator of Oakley Generating Station
Total Particulate Matter:	The sum of all filterable and all condensable particulate matter.

ACRONYMS

AAQS	Ambient Air Quality Standard
ARB	Air Resource Board
BTU	British Thermal Unit
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
Cal ISO	California Independent System Operator
CAISO	California Independent System Operator
CARB	California Air Resources Board
CEC	California Energy Commission
CEM	Continuous Emission Monitor
CEQA	California Environmental Quality Act
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CPUC	California Public Utilities Commission
CTG	Combustion Turbine Generator
EO/APCO	Executive Officer/Air Pollution Control Officer
EPA	Environmental Protection Agency
ERC	Emission Reduction Credit
FDOC	Final Determination of Compliance
FSNL	Full Speed No Load
GHG	Greenhouse Gases
GT	Gas Turbine

MW	Megawatt
NH_3	Ammonia
N_2	Nitrogen
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NSR	New Source Review
O_2	Oxygen
LAER	Lowest Achievable Emissions Rate
MMBtu	Million Btu
NAAQS	National Ambient Air Quality Standard
PAH	Polycyclic Aromatic Hydrocarbon
PDOC	Preliminary Determination of Compliance
PG&E	Pacific Gas & Electric Company
PM10	Particulate Matter less than 10 Microns in Diameter
PM2.5	Particulate Matter less than 2.5 Microns in Diameter
POC	Precursor Organic Compounds
ppmvd	Parts Per Million by Volume, Dry
PSD	Prevention of Significant Deterioration
PUC	Public Utilities Commission
RACT	Reasonably Available Control Technology
RATA	Relative Accuracy Test Audit
SCAQMD	South Coast Air Quality Management District
SNCR	Selective Non-catalytic Reduction
SCR	Selective Catalytic Reduction
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	Sulfur Dioxide
SOx	Sulfur Oxides
TAC	Toxic Air Contaminant
TBACT	Toxics Best Available Control Technology
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

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AIR QUALITY APPENDIX AIR-1

Greenhouse Gas Emissions

Brewster Birdsall, P.E., QEP

SUMMARY OF CONCLUSIONS

The proposed OGS project is a proposed addition to the state's electricity system. It would be an efficient, new, flexible, and dispatchable natural gas-fired combined-cycle power plant that would produce greenhouse gas (GHG) emissions while generating electricity for California consumers. The power plant would provide a rapid-starting nominal net generating capacity of 624 MW with a maximum energy production of approximately 5,300,000 MWh/yr (AFC Section 2.6, OGS 2009a).

Its addition to the system would displace other less efficient, slower starting, and less flexible plants and facilitate the integration of renewable resources. Because the project will improve the efficiency of existing system resources and provide services needed to integrate renewable generation, the addition of OGS would contribute to a reduction of the California and overall Western Electricity Coordinating Council system GHG[3] emissions and GHG emission rate average.

Staff notes that mandatory reporting of the GHG emissions provides the necessary information for the California Air Resources Board (ARB) to develop greenhouse gas regulations and/or trading markets required by the California Global Warming Solutions Act of 2006 (AB 32 Núñez, Statutes of 2006, Chapter 488, Health and Safety Code sections 38500 et seq.). The facility will also be required to report GHG emissions to the federal government. The project may be subject to additional reporting requirements and GHG reductions or trading requirements as these regulations are implemented.

The Energy Commission adopted an order initiating an informational (OII) proceeding (08-GHG OII-1) to explore methods of assessing the greenhouse gas impacts of proposed new power plants in accordance with the California Environmental Quality Act (CEQA). This analysis provides the staff's conclusions regarding greenhouse gas emissions for this siting case, and at this time, "prudent use" of natural gas for electricity generation will serve to optimize the system (for integrating intermittent renewable generation and providing reliability). Without further analysis and policy direction by the Commission to refine this general understanding, this analysis leaves the implications for optimizing the system to future cases (CEC 2009a). New information and policy direction from the Energy Commission and other agencies including ARB may trigger refining this method of GHG impact analysis, and the Energy Commission is committed to evaluating this and refinements as part of the *2011 Integrated Energy Policy Report* (CEC 2010b).

[3] Fuel-use closely correlates to carbon dioxide (CO_2) emissions from natural gas-fired power plants. And since CO_2 emissions from the fuel combustion dominate greenhouse gas (GHG) emissions from power plants, the terms CO_2 and GHG are used interchangeably in this section.

The operation of OGS would affect the overall electricity system operation and GHG emissions in several ways:

- OGS would provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation.
- OGS would displace some less efficient and less flexible local generation in the dispatch order of gas-fired facilities that are required to provide electricity reliability in California and the overall Western Electricity Coordinating Council electric transmission system.
- OGS would facilitate to some degree the replacement of out-of-state coal electricity generation that must be phased out in conformance with the State's Greenhouse Gas Emissions Performance Standard.
- OGS would facilitate the replacement of generation provided by power plants that are aging and/or using once-through cooling.

The proposed OGS would be designed to provide flexible, dispatchable power with units that are short-starting and fast-ramping. The project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff believes that the project would result in a net reduction in GHG emissions from power plants, would not worsen, but would improve, current conditions, and would, thus, not result in impacts that are cumulatively significant.

Staff concludes that the short-term emission of greenhouse gases during construction would be sufficiently reduced by "best practices" and would not be significant.

The project would comply with the limits of the Greenhouse Gas Emission Performance Standard (Title 20, California Code of Regulations, section 2900 et seq.; SB 1368) that applies to utility purchases of base load power from power plants.

INTRODUCTION

Greenhouse gas (GHG) emissions are not criteria pollutants, but they are discussed in the context of cumulative impacts. In December 2009, the U.S. Environmental Protection Agency (EPA) declared that greenhouse gases (GHGs) threaten the public health and welfare of the American people (the endangerment finding), and this became effective on January 14, 2010. Regulating GHG at the federal level is furthered by the Prevention of Significant Deterioration (PSD) program and New Source Review (NSR) rule changes finalized by U.S. EPA in early 2010. Under the current schedule, the PSD requirements for GHG would apply after July 1, 2011 to new facilities whose carbon dioxide-equivalent emissions exceed 100,000 tons per year (U.S.EPA2010). The GHG emissions from OGS would exceed this limit and the facility would become subject to PSD if commencing construction after July 1, 2011.

Federal rules that became effective December 29, 2009 (40 CFR 98) already require federal reporting of GHG emissions. As federal rulemaking evolves, Energy Commission staff focuses on analyzing the ability of the project to comply with existing state-level policies and programs for GHG. The state has demonstrated its intent to

address global climate change though research, adaptation,[4] and GHG inventory reductions. In that context, staff evaluates the GHG emissions from the proposed project, presents information on GHG emissions related to electricity generation, and describes the applicable GHG standards and requirements.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies in **Greenhouse Gas Table 1** pertain to the control and mitigation of greenhouse gas emissions. Staff's analysis examines the project's compliance with these requirements.

Greenhouse Gas Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Mandatory Reporting of Greenhouse Gases (40 CFR 98, Subpart D)	The mandatory reporting rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tonnes of CO_2-equivalent emissions per year.
Prevention of Significant Deterioration Program (40 CFR 51 & 52)	Any new source of GHG exceeding 100,000 tons per year CO_2-equivalent and commencing construction after July 1, 2011 would be considered to be a major stationary source and subject to PSD permitting requirements including review of Best Available Control Technology.
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	California Global Warming Solutions Act of 2006. This act requires the California Air Resources Board (ARB) to enact standards that will reduce GHG emissions to 1990 levels. Electricity production facilities will be regulated by the ARB.
California Code of Regulations, tit. 17, Subchapter 10, Article 2, sections 95100 et. seq.	ARB regulations implementing mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)
California Code of Regulations, tit. 20, section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 $MTCO_2$/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lb CO_2/MWh). Known as SB 1368 (Perata, Chapter 598, Statutes of 2006) Emission Performance Standard.

GLOBAL CLIMATE CHANGE AND CALIFORNIA

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of greenhouse gases, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Indeed, the California Legislature

[4] While working to understand and reverse global climate change, it is prudent to also adapt to potential changes in the state's climate (for example, changing rainfall patterns).

finds that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Health & Safety Code, sec. 38500).

In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p.5). In 2003, the Energy Commission recommended that the state require reporting of greenhouse gases or global climate change[5] emissions as a condition of state licensing of new electric generating facilities (CEC 2003, IEPR p. 42). Three years later, California enacted the California Global Warming Solutions Act of 2006 (AB 32). It requires the California Air Resources Board (ARB) to adopt standards that will reduce statewide GHG emissions to statewide GHG emissions levels in 1990, with such reductions to be achieved by 2020.[6] To achieve this, ARB has a mandate to define the 1990 emissions levels and achieve the maximum technologically feasible and cost-effective GHG emission reductions.

The ARB adopted early action GHG reduction measures in October 2007, adopted mandatory reporting requirements and the 2020 statewide target in December 2007, and adopted a statewide scoping plan in December 2008 to identify how emission reductions will be achieved from significant sources of GHG via regulations, market mechanisms, and other actions. On December 16, 2010 ARB adopted structural requirements for a GHG cap and trade program and by October 2011 must adopt all enabling regulations, including several provisions that will affect new power plants. These regulations must be submitted to California's Office of Administrative Law for approval so that they could become operational by January 2012. ARB is developing the rules and regulations to implement its plan and holds ongoing public workshops on key elements of the recommended GHG reduction measures. Many of the regulations are on target to be effective by January 1, 2011, and mandatory compliance commences on January 1, 2012. The mandatory reporting requirements are effective for electric generating facilities over 1 megawatt (MW) capacity, and the due date for initial reports by existing facilities this first year was June 1, 2009.

Examples of strategies that the state is pursuing for managing GHG emissions in California, in addition to those recommended by the Energy Commission and the Public Utilities Commission, were identified in the California Climate Action Team's Report to the Governor (CalEPA 2006). The scoping plan approved by the ARB in December 2008 builds upon the overall climate policies of the Climate Action Team report and shows the recommended strategies to achieve the goals for 2020 and beyond. Some strategies focus on reducing consumption of petroleum across all areas of the California economy. Improvements in transportation energy efficiency (fuel economy) and land use planning and alternatives to petroleum-based fuels are slated to provide substantial reductions by 2020 (CalEPA 2006). The scoping plan includes a 33% Renewables Portfolio Standard (RPS), aggressive energy efficiency targets, and a cap-and-trade system that includes the electricity sector (ARB 2008c).

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[5] Global climate change is the result of greenhouse gases, or emissions with global warming potentials, affecting the energy balance and, thereby, climate of the planet. The terms greenhouse gases (GHG) and global climate change (GCC) gases are used interchangeably.

[6] Governor Schwarzenegger has also issued Executive Order S-3-05 establishing a goal of 80% below 1990 levels by 2050.

It is possible that GHG reductions mandated by ARB will be non-uniform or disproportional across emitting sectors, in that most reductions will be based on cost-effectiveness (i.e., the greatest effect for the least cost). For example, the ARB proposes a 40% reduction in GHG from the electricity sector, even though the sector currently only produces about 25% of the state's GHG emissions. In response, in September 2008 the Energy Commission and the California Public Utilities Commission provided recommendations (CPUC 2008) to ARB on how to achieve such reductions through both programmatic and regulatory approaches and identified points of regulation within the sector for a multi-sector cap-and-trade system.

The Energy Commission's *2007 Integrated Energy Policy Report* (IEPR) also addresses climate change within the electricity, natural gas, and transportation sectors (CEC 2007a). For the electricity sector, it recommends such approaches as pursuing all cost-effective energy efficiency measures and meeting the Governor's stated goal of a 33% Renewables Portfolio Standard. The Energy Commission's *2009 Integrated Energy Policy Report* continued to emphasize the importance of meeting greenhouse gas emissions reduction goals along with other important statewide issues such as phasing out use of once-through cooling in coastal California power plants (CEC 2009d). The *2011 Integrated Energy Policy Report* will examine the Energy Commission's process for satisfying CEQA requirements for evaluating GHG emissions in power plant cases (CEC 2010b).

SB 1368,[7] also enacted in 2006, and regulations adopted by the Energy Commission and the Public Utilities Commission pursuant to the bill, prohibit California utilities from entering into long-term commitments with any base load facilities that exceed the Greenhouse Gas Emission Performance Standard of 0.500 metric tonnes CO_2 per megawatt-hour[8] (1,100 pounds CO_2/MWh). Specifically, the SB 1368 Emission Performance Standard (EPS) applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California. If a project, instate or out of state, plans to sell base load electricity to California utilities, the utilities will have to demonstrate that the project complies with the EPS. *Base load* units are defined as those designed and intended to provide electricity at an annualized plant capacity factor of at least 60%. Compliance with the EPS is determined by dividing the annual average carbon dioxide emissions by the annual average net electricity production in MWh. This determination is based on capacity factors, heat rates, and corresponding emissions rates that reflect the *expected* operations of the power plant and not on full load heat rates [20 CCR §2903(a)].

In addition to these programs, California is involved in the Western Climate Initiative, a multi-state and international effort to establish a cap-and-trade market to reduce greenhouse gas emissions in the western United States and the Western Electricity Coordinating Council (WECC). The timelines for the implementation of this program are similar to those of AB 32, with full roll-out beginning in 2012. As with AB 32, the electricity sector has been a major focus of attention.

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[7] California Code of Regulations, Title 20 § 2900 and Public Utilities Code § 8340 et seq.

[8] The Emission Performance Standard only applies to carbon dioxide and does not include emissions of other greenhouse gases converted to carbon dioxide equivalent.

ELECTRICITY PROJECT GREENHOUSE GAS EMISSIONS

Electricity use can be as simple as turning on a switch to operate a light or fan. The system to deliver the adequate and reliable electricity supply is complex and variable. But it operates as an integrated whole to meet demand, such that the dispatch of a new source of generation unavoidably curtails or displaces one or more less efficient or less competitive existing sources. Within the system, generation resources provide electricity, or energy, generating capacity, and ancillary services to stabilize the system and facilitate electricity delivery, or movement, over the grid. *Capacity* is the instantaneous output of a resource, in megawatts. *Energy* is the capacity output over a unit of time, for example an hour or year, generally reported as megawatt-hours or gigawatt-hours (GWh). Ancillary services[9] include regulation, spinning reserve, non-spinning reserve, voltage support, and black start capability. Individual generation resources can be built and operated to provide only one specific service. Alternatively, a resource may be able to provide one or all of these services, depending on its design and constantly changing system needs and operations.

California is actively pursuing policies to reduce GHG emissions that include adding non-GHG emitting renewable generation resources to the system mix. In this context, and because fossil-fueled resources produce GHG emissions, it is important to consider the role and necessity of also adding fossil-fuel resources. A report prepared as a response to the GHG OII (CEC 2009a) defines five roles that gas-fired power plants are likely to fulfill in a high-renewables, low-GHG system (CEC 2009b, pp 93 and 94):

1. Intermittent generation support
2. Local capacity requirements
3. Grid operations support
4. Extreme load and system emergency
5. General energy support.

The Energy Commission staff-sponsored report assumes that non-renewable power plants added to the system would almost exclusively be natural gas-fueled. Nuclear, geothermal, and biomass plants are generally base load and not dispatchable. Solid fueled projects are also generally base load, not dispatchable and carbon sequestration technologies needed to reduce the GHG emission rates to meet the EPS are not yet developed (CEC 2009b, p. 92). Further, California has almost no sites available to add highly dispatchable hydroelectric generation.

Generation of electricity using any fossil fuel, including natural gas, can produce greenhouse gases with the criteria air pollutants that have been traditionally regulated under the federal and state Clean Air Acts. For fossil fuel-fired power plants, the GHG emissions include primarily carbon dioxide, with much smaller amounts of nitrous oxide (N_2O, not NO or NO_2, which are commonly known as NOx or oxides of nitrogen), and methane (CH_4 – often from unburned natural gas). Also included are sulfur hexafluoride

[9] See CEC 2009b, page 95.

(SF_6) from high voltage equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. GHG emissions from the electricity sector are dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG emissions are small and also are more likely to be easily controlled or reused or recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials. Global warming potential is a relative measure, compared to carbon dioxide, of a compound's residence time in the atmosphere and ability to warm the planet. Mass emissions of GHGs are converted into carbon dioxide equivalent (CO2e) metric tonnes (MT) for ease of comparison.

CONSTRUCTION

Construction of industrial facilities such as power plants requires coordination of a variety of equipment and personnel. The concentrated on-site activities result in short-term, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. Construction of OGS would involve 33 months of activity and GHG emissions (CH2MHILL2010d). The GHG emissions estimate, presented below in **Greenhouse Gas Table 2**, includes the total emissions for construction activity in terms of CO_2-equivalent.

Greenhouse Gas Table 2
OGS, Estimated Potential Construction Greenhouse Gas Emissions

Construction Source	Construction-Phase GHG Emissions (MTCO2e) [a]
Onsite construction equipment	10,524
Worker travel to/from construction site [b]	1,013
Deliveries to construction site [b]	806
Rail deliveries to construction site	44
Construction Total	12,387

Source: AFC Appendix 5.1E (CH2MHILL2010d); DR32, DR33 (CH2MHILL2010a); WSQ4-1 (CH2MHILL2010m).
Notes:
a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
b. Motor vehicle emissions of CO2-equivalent are approximately 95% CO_2.

OPERATIONS

The proposed OGS would be a combined-cycle power plant providing a nominal capacity of 624 megawatts (MW) through two stationary combustion turbine-generators and a steam turbine generator. The OGS would be available for either base-load or load-following duty, but to provide maximum flexibility it would be permitted to operate at an annual capacity factor of up to 97%. The actual operational profile of this power plant will depend on the variable demand for electricity, the supply of other generation including intermittent renewable resources, and the need to provide year-round electricity reliability.

The primary sources of GHG emissions would be the natural gas fired combustion turbines. There would also be a small amount of GHG emissions from sulfur hexafluoride (SF_6) leaking from new electrical equipment. The employee and delivery traffic GHG emissions from off-site activities are negligible in comparison with the gas turbine GHG emissions.

Greenhouse Gas Table 3 shows what the proposed project, as permitted, could potentially emit in greenhouse gases annually if it operated at its maximum permitted capacity factor of 97%. All emissions are converted to CO_2-equivalent and totaled. Electricity generation GHG emissions are generally dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG are typically small and also are more likely to be easily controlled or reused/recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials. A small amount of new SF_6 containing equipment would be required for this project, and the leakage of SF_6 and its CO_2 equivalent emissions have been estimated.

Greenhouse Gas Table 3
OGS, Estimated Potential Greenhouse Gas (GHG) Emissions

Emissions Source	**Operational GHG Emissions (MTCO2e/yr)** [a]
Combustion Turbine Generators (Two CTGs) [c]	1,873,220
Auxiliary Boiler	11,569
Diesel Fire Water Pump Engine	10
Worker Commutes (Off-Site) [b]	58
Material Deliveries (Off-Site) [b]	20
Equipment Leaks (SF_6)	11
Total Project GHG Emissions, excluding Off-Site Emissions (MTCO2e/yr)	**1,884,810**
Estimated Annual Energy Output (MWh/yr) [c]	5,281,000
Estimated Annualized GHG Performance (MTCO2/MWh) [d]	**0.357**

Sources: AFC Supplement Table 5.1A-11 (CH2MHILL2010d); Response to DR28 (CH2MHILL2010a); (BAAQMD2010).
Notes:

a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
b. Motor vehicle emissions of CO2-equivalent are approximately 95% CO_2.
c. Based on maximum permitted capacity of up to 624 MW at 8,463 hours annually (97% annual capacity factor).
d. This rate does not depend on capacity factor or hours of operation per year.

The proposed project would be permitted, on an annual basis, to emit nearly 1,885,000 metric tonnes of CO_2-equivalent per year (MTCO2e/yr) if operated at its maximum permitted level (BAAQMD 2010). The proposed OGS, at 0.357 MTCO2/MWh, would easily meet the limits of SB 1368 and the Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh, regardless of the hours of operation per year.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff assesses the cumulative effects of GHG emissions caused by both construction and operation. As the name implies, construction impacts result from the emissions occurring during the project's construction phase. The operation impacts result from the emissions of the proposed project during operation. Staff is continuing to monitor development of AB 32 Scoping Plan implementation efforts and general trends and developments affecting GHG regulation in the electricity sector.

The impact of GHG emissions caused by this natural gas-fired facility is characterized by considering how the power plant would affect the overall electricity system. The

integrated electricity system depends on generation resources to provide energy and satisfy local capacity needs. Energy Commission staff follows the concept of a "blueprint" to describe the long-term roles of fossil-fueled power plants in California's electricity system (CEC 2009a). The five separate roles that gas-fired power plants are most likely to fulfill in the future of a high-renewables, low-GHG system include: 1) Intermittent generation support; 2) Local capacity requirements; 3) Grid operations support; 4) Extreme load and system emergencies support; and 5) General energy support (CEC 2009b, p. 93). The proposed OGS is analyzed here for its role in providing local capacity and generation, intermittent generation support, and general energy support for expected generation retirements or replacements.

CONSTRUCTION IMPACTS

Staff does not believe that the minor GHG emission increases from construction activities would be significant for several reasons. First, the period of construction would be short-term and the emissions intermittent during that period, not ongoing during the life of the project. Additionally, control measures that staff recommends to address criteria pollutant emissions, such as limiting idling times and requiring, as appropriate, using equipment that meets the latest criteria pollutant emissions standards would further minimize greenhouse gas emissions to the extent feasible. The use of newer equipment will increase fuel efficiency and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment.

DIRECT/INDIRECT OPERATION IMPACTS AND MITIGATION

New, efficient, natural gas-fired generation promotes the state's efforts to improve GHG electrical generation efficiencies and, therefore, reduce the amount of natural gas used by electricity generation and greenhouse gas emissions. As the *2007 Integrated Energy Policy Report* (CEC 2007a, p. 184) noted:

> New natural gas-fueled electricity generation technologies offer efficiency, environmental, and other benefits to California, specifically by reducing the amount of natural gas used—and with less natural gas burned, fewer greenhouse gas emissions. Older combustion and steam turbines use outdated technology that makes them less fuel- and cost-efficient than newer, cleaner plants.…The 2003 and 2005 IEPRs noted that the state could help reduce natural gas consumption for electric generation by taking steps to retire older, less efficient natural gas power plants and replace or repower them with new, more efficient power plants.

Thus, in the context of the Energy Commission's *Integrated Energy Policy Report*, the OGS furthers the state's strategy to promote generation system efficiency and reduce fuel use and GHG emissions. As stated in the 2009 *Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California* (CEC 2009b, p.23):

> When one resource is added to the system, all else being held equal, another resource will generate less power. If the new resource has a lower cost or fewer

emissions than the existing resource mix, the aggregate system characteristics will change to reflect the cheaper power and lower GHG emissions rate.

Net GHG emissions for the integrated electric system will decline when new gas-fired power plants are added to: 1) permit the penetration of renewable generation to the 33% target; 2) improve the overall efficiency of the electric system; or 3) serve load growth or capacity needs more efficiently than the existing fleet (CEC 2009b, p. 98).

The Role of OGS in Local Generation Displacement

The proposed OGS would have a net heat rate of approximately 6,779 Btu/kWh[10], which leads to a maximum estimated GHG performance factor of 0.36 MTCO2/MWh. The heat rate, energy output and GHG emissions of other local generation resources are listed in **Greenhouse Gas Table 4**.

The OGS would be available to compete as a provider of efficient base-load power and load-following power along with other existing and planned plants in the Greater San Francisco Bay Area. Compared to the other existing power plants that remain in place to provide local reliability and that OGS would be likely to displace, the proposed OGS would be more efficient, and emit fewer GHG emissions during any hour of operation. **Greenhouse Gas Table 4** shows that OGS would have a lower heat rate than many of the existing generating facilities currently used for base load capacity in the Greater Bay Area. As such, the OGS would not increase the overall system heat rate for natural gas-fired power plants.

Local generating units with the best (lowest) heat rate or lowest GHG performance factor generally operate more than other units with higher heat rates, as shown by the relative amount of energy (GWh) produced in 2009 from the local units. Dispatch order generally follows economic or efficiency dispatch, although it can deviate during any one year or due to other concerns such as permit limits, contractual obligations, droughts, heat waves, local reliability needs or emergencies. These deviations, however, are likely to occur infrequently and are unplanned. Note that dispatch can also follow other characteristics, such as ability to quickly start and come up to full load. The flexibility of OGS ensures that it would not increase the overall system heat rate for natural gas-fired power plants because it would provide reliability service without running during times when less flexible units would otherwise be starting. The flexibility of OGS to quickly respond to changing grid conditions would make it preferential to other local units in the dispatch order.

[10] Based on the High Heating Value (HHV) of the fuel(s) used. HHV is used for all heat rate and fuel conversions to GHG mass emissions that are discussed in this document.

Greenhouse Gas Table 4
Greater Bay Area, Local Generation Heat Rates and 2009 Energy Outputs

Plant Name	Heat Rate (Btu/kWh) [a]	2009 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Gateway Generating Station (became commercial in 2009)	7,123	2,490.2	0.378
Los Medanos Energy Center	7,184	3,394.7	0.381
Delta Energy Center	7,308	5,013.5	0.387
Contra Costa Power Plant, Unit 6	13,499	21.1	0.716
Contra Costa Power Plant, Unit 7	11,182	176.9	0.593
Pittsburg Power Plant, Unit 5	11,461	103.3	0.608
Pittsburg Power Plant, Unit 6	11,918	84.4	0.632
Pittsburg Power Plant, Unit 7	14,629	29.3	0.776
Proposed OGS (at permitted limit)	**6,779**	**5,300 (max est.)**	**0.357**

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER); shows the proposed OGS capacity of up to 624 MW at 8,463 hours annually (97% annual capacity factor).
Notes: a. Based on the Higher Heating Value or HHV of the fuel.

The proposed OGS would be interconnected to the transmission system at a point within the Greater Bay Area, which is a major local reliability area, and it would provide local reliability service that would be likely to displace other existing power plants within the area.

The Role of OGS in the Integration of Renewable Energy

As California moves towards an increased reliance on renewable energy, the bulk of new renewable generation available to, and used in California, will be intermittent wind generation with some intermittent solar (CEC 2009b, p.3). To accommodate the increased variability in generation due to increasing renewable penetration, compounded by increasing load variability, control authorities such as the California Independent System Operator (CAISO) need increased flexibility from other generation resources such as hydro generation, dispatchable pump loads, energy storage systems, and fast ramping and fast starting fossil fuel generation resources (CAISO 2007; CAISO 2010).

OGS would provide flexible, highly dispatchable power. The “Rapid Response” capability of OGS allows each of the combustion turbine generators to start up and reach full load in less than 90 minutes for all cases, and hot/warm startups would occur in less than 30 minutes (AFC 4/10 supplement Table 5.1-6) OGS would provide short-starting[11] and fast-ramping[12] power under the CAISO use of these terms, which set a fast start as under 10 minutes. OGS would also provide a wide range of turndown operation, and it would be considered as fast starting for this Energy Commission staff assessment because of its ability to come to full load in less than two hours. OGS would

[11] Energy Commission staff identified facilities with startup times less than 2 hours as *fast-start* in the report Expected Roles for Gas-Fired Generation (CEC2009b). The CAISO categorizes units with startup times less than 10 minutes as *fast-start* and units with startup times less than 2 hours as *short-start* in the report for 2010 Integration of Renewable Resources (CAISO 2010).

[12] The CAISO categorizes *fast-ramping* as a generator capable of going from lowest power to highest in under 20 minutes, or greater than 10 MW per minute.

not obstruct penetration of renewable energy due to its ability to turn down to low loads and to achieve startups in less than two hours. OGS is likely to serve as an important firming source for intermittent renewable resources in support of California's RPS and GHG goals. The short starting units would support the CAISO need for flexible and dispatchable resources. OGS also would have relatively low minimum operating times, which means that it can be started and ramped up quickly, then shutdown after a short duration to enhance the integration and backup of intermittent renewable deliveries.

The flexibility of the dispatchable fossil fuel generation fleet will have to be significantly increased to meet the statewide 20% RPS (CAISO 2010, p. xv); the 33% RPS will require even more flexibility to integrate the renewables. However, this does not suggest the existing and new fossil fuel capacity will operate more. **Greenhouse Gas Table 5** shows how the build-out of either the 20% or the 33% statewide RPS goal will affect generation from new and existing non-renewable resources. Should California reach its goal of meeting 33% of its retail demand in 2020 with renewable energy, non-renewable, most likely fossil-fueled, energy needs will fall by over 36,000 GWh/year. In other words, all growth will need to come from renewable resources to achieve the 33% RPS. And some existing and new fossil units will generate less energy than they currently do, given the expected growth in retail sales.

These assumptions are conservative in that the forecasted growth in retail sales assumes that the impacts of planned increases in expenditures on (uncommitted) energy efficiency are already embodied in the retail sales forecast.[13] Energy Commission staff estimates that as much as 18,000 GWh of additional savings due to uncommitted energy efficiency programs may be forthcoming.[14] This would reduce non-renewable energy needs by a further 12,000 GWh given a 33% RPS.

The OGS would not interfere with generation from existing renewable facilities nor with the integration of new renewable generation. The OGS is designed to operate either for reliability, which provides backup and renewable integration purposes or for base load purposes (AFC Section 2, OGS 2009a). OGS would be much more likely to foster integration of renewable energy than comparable non-renewable base load or intermediate energy resources.

[13] Energy efficiency savings are already represented in the current Energy Commission demand forecast adopted December 2009 (CEC2009c).

[14] See *Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 Integrated Energy Policy Report Adopted Demand Forecast* (CEC-200-2010-001-D, January, 2010), page 2. Table 1 indicates that additional conservation for the three investor-owned utilities may be as high as 14,374 GWh. Increasing this value by 25% to account for the state's publicly-owned utilities yields a total reduction of 17,967 GWh.

Greenhouse Gas Table 5
Estimated Changes in Non-Renewable Energy Potentially Needed to Meet California Loads, 2008 to 2020

California Electricity Supply	Annual GWh	
Statewide Retail Sales, 2008, actual [a]	264,794	
Statewide Retail Sales, 2020, forecast [a]	289,697	
Growth in Retail Sales, 2008-20	24,903	
Growth in Net Energy for Load, 2008-20 [b]	29,840	
California Renewable Electricity	**GWh @ 20% RPS**	**GWh @ 33% RPS**
Renewable Energy Requirements, 2020 [c]	57,939	95,600
Current Renewable Energy, 2008	29,174	
Change in Renewable Energy, 2008-20 [c]	28,765	66,426
Resulting Change in Non-Renewable Energy	176	-36,586

Source: Energy Commission staff 2010.
Notes:
a. 2009 IEPR Demand Forecast, Form 1.1c. Excludes pumping loads for entities that do not have an RPS.
b. 2009 IEPR Demand Forecast, Form 1.5a.
c. RPS requirements are a percentage of retail sales.

The Role of OGS in Retirements/Replacements

OGS would be permitted to provide about 5,300 GWh of natural gas-fired generation that could replace resources that are or will likely be precluded from serving California loads. State policies, including GHG goals, are discouraging or prohibiting new contracts and new investments in coal-fired generation, generation that relies on water for once-through cooling, and aging power plants (CEC 2007a). Some of the existing plants that are likely to require significant capital investments to continue operation in light of these policies may be unlikely to undertake the investments and will retire or be replaced.

Replacement of Coal-Fired Generation

Coal-fired resources are effectively prohibited from entering into new long-term, base load contracts for California deliveries as a result of the Emissions Performance Standard adopted in 2007 pursuant to SB 1368. Between now and 2020, more than 18,000 GWh of energy procured by California utilities under existing contracts will have to be replaced; these contracts are listed in **Greenhouse Gas Table 6**.

This represents almost half of the energy associated with California utility contracts with coal-fired resources that will expire by 2030. If the State enacts a carbon adder[15], all the coal contracts (including those in **Greenhouse Gas Table 6**, which expire by 2020, and other contracts that expire beyond 2020 and are not shown in the table) may be retired at an accelerated rate as coal-fired energy becomes uncompetitive. Also shown are the

[15] A carbon adder or carbon tax is a specific value added to the cost of a project per ton of associated carbon or carbon dioxide emissions. Because it is based on, but not limited to, actual operations and emission and can be trued up at year end, it is considered a simple mechanism to assign environmental costs to a project.

approximate 500 MW of in-state coal and petroleum coke-fired capacity that may not be able to enter into long-term contracts with California utilities due to the SB 1368 Emission Performance Standard. As these contracts expire, new and existing generation resources will replace the lost energy and capacity. Some will come from renewable generation; some will come from new and existing natural gas fired generation. New generation resources like OGS generally emit significantly less GHG than the coal and petroleum coke-fired generation, which average about 1.0 MTCO2/MWh, resulting in a significant net reduction in GHG emissions from the California electricity sector.

Greenhouse Gas Table 6
Expiring Long-term Contracts with Coal-fired Generation 2009 – 2020

Utility	Facility [a]	Contract Expiration	Annual GWh Delivered to CA
PG&E, SCE	Misc In-state Qual. Facilities [a]	2009-2019	4,086
LADWP	Intermountain	2009-2013	3,163 [b]
City of Riverside	Bonanza, Hunter	2010	385
Department of Water Resources	Reid Gardner	2013 [c]	1,211
SDG&E	Boardman	2013	555
SCE	Four Corners	2016	4,920
Turlock Irrigation District	Boardman	2018	370
LADWP	Navajo	2019	3,832
		TOTAL	**18,522**

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings.
Notes:
a. All facilities are located out-of-state except for the Miscellaneous In-state Qualifying Facilities.
b. Estimated annual reduction in energy provided to LADWP by Utah utilities from their entitlement by 2013.
c. Contract not subject to Emissions Performance Standard, but the Department of Water Resources has stated its intention not to renew or extend.

Retirement of Generation Using Once-Through Cooling

New, dispatchable resources like OGS would also be required to provide generation capacity (that is, the ability to meet fluctuating, intermittent electricity loads) in the likely event that facilities utilizing once-through cooling (OTC) are retired. The State Water Resource Control Board (SWRCB) has proposed significant changes to OTC units, which would likely require retrofit, retirement, or significant curtailment of dozens of generating units. In 2008, these units collectively produced about 58,000 GWh. While those OTC facilities owned and operated by utilities and recently-built combined cycle plants may opt to install new cooling systems, it is unlikely that the aging, merchant plants will do so. Most of these units operate at low capacity factors, suggesting a limited ability to compete in the current electricity market. Although the timing would be uncertain, new resources would out-compete aging plants and would likely displace the energy provided by OTC facilities and accelerate the retirements.

Any additional costs associated with complying with the SWRCB regulation would be amortized over a limited revenue stream today and into the foreseeable future. Their

energy and much of their dispatchable, load-following capability will have to be replaced. These units constitute over 15,000 MW of merchant capacity and 17,800 GWh of merchant energy. Of this, much but not all of the capacity and energy are in local reliability areas, requiring a large share of replacement capacity – absent transmission upgrades – to locations in the same local reliability area. **Greenhouse Gas Table 7** provides a summary of the utility and merchant energy supplies affected by the OTC regulations.

Greenhouse Gas Table 7
Units Utilizing Once-Through Cooling: Capacity and 2008 Energy Output [a]

Plant, Unit Name	Owner	Local Reliability Area	Aging Plant?	Capacity (MW)	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Diablo Canyon 1, 2	Utility	None	No	2,232	17,091	Nuclear
San Onofre 2, 3	Utility	L.A. Basin	No	2,246	15,392	Nuclear
Broadway 3 [b]	Utility	L.A. Basin	Yes	75	90	0.648
El Centro 3, 4 [b]	Utility	None	Yes	132	238	0.814
Grayson 3-5 [b]	Utility	LADWP	Yes	108	150	0.799
Grayson CC [b]	Utility	LADWP	Yes	130	27	0.896
Harbor CC	Utility	LADWP	No	227	203	0.509
Haynes 1, 2, 5, 6	Utility	LADWP	Yes	1,046	1,529	0.578
Haynes CC [c]	Utility	LADWP	No	560	3,423	0.376
Humboldt Bay 1, 2 [a]	Utility	Humboldt	Yes	107	507	0.683
Olive 1, 2 [b]	Utility	LADWP	Yes	110	11	1.008
Scattergood 1-3	Utility	LADWP	Yes	803	1,327	0.618
Utility-Owned				**7,776**	**39,988**	**0.693**
Alamitos 1 - 6	Merchant	L.A. Basin	Yes	1,970	2,533	0.661
Contra Costa 6, 7	Merchant	S.F. Bay Area	Yes	680	160	0.615
Coolwater 1-4 [b]	Merchant	None	Yes	727	576	0.633
El Segundo 3, 4	Merchant	L.A. Basin	Yes	670	508	0.576
Encina 1-5	Merchant	San Diego	Yes	951	997	0.674
Etiwanda 3, 4 [b]	Merchant	L.A. Basin	Yes	666	848	0.631
Huntington Beach 1, 2	Merchant	L.A. Basin	Yes	430	916	0.591
Huntington Beach 3, 4	Merchant	L.A. Basin	No	450	620	0.563
Mandalay 1, 2	Merchant	Ventura	Yes	436	597	0.528
Morro Bay 3, 4	Merchant	None	Yes	600	83	0.524
Moss Landing 6, 7	Merchant	None	Yes	1,404	1,375	0.661
Moss Landing 1, 2	Merchant	None	No	1,080	5,791	0.378
Ormond Beach 1, 2	Merchant	Ventura	Yes	1,612	783	0.573
Pittsburg 5-7	Merchant	S.F. Bay Area	Yes	1,332	180	0.673
Potrero 3	Merchant	S.F. Bay Area	Yes	207	530	0.587
Redondo Beach 5-8	Merchant	L.A. Basin	Yes	1,343	317	0.810
South Bay 1-4	Merchant	San Diego	Yes	696	1,015	0.611
Merchant-Owned				**15,254**	**17,828**	**0.605**
Total In-State OTC				**23,030**	**57,817**	

Source; Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings

Notes:

a. OTC Humboldt Bay Units 1 and 2 are included in this list. They must retire in 2010 when the new Humboldt Bay Generating Station (not ocean-cooled) enters commercial operation (late-2010).

b. Units are aging but are not OTC.

c. The Los Angeles Department of Water and Power (LADWP) reported a 2007 aggregate energy number of 4,003 GWh for all the Haynes units. Staff allocated the energy between the units based on Haynes' current and historical output allocations in the LADWP fillings for 2009 IEPR.

New generation resources that can either provide local support or energy will emit significantly less GHGs than the OTC fleet. Existing aging and OTC natural gas generation averages 0.6 to 0.7 MTCO2/MWh, which is substantially higher than the emission rate for OGS. When a project provides energy and capacity, depending on its location, it can provide a significant net reduction in GHG emissions from the electricity sector. The OGS would provide improved efficiency and flexibility when compared with these aging and OTC facilities. Given the proposed transmission line connection, the OGS would be located in the Greater Bay Area Local Capacity Area, which is a major load pocket, and as such would provide local reliability support as well as potentially facilitate the retirement of aging and/or OTC power plants.

CUMULATIVE IMPACTS

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or . . . compound or increase other environmental impacts" (CEQA Guidelines § 15355). "A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts" (CEQA Guidelines § 15130[a][1]). Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects.

This entire assessment is a cumulative impact assessment. The project would emit greenhouse gases and, therefore, has been analyzed as a potential cumulative impact in the context of its effect on the electricity system, resulting GHG emissions from the system, and existing GHG regulatory requirements and GHG energy policies.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Ultimately, ARB's AB 32 regulations are likely to address both the degree of electricity generation sector emissions reductions (through cap-and-trade), and the method by which those reductions will be achieved (e.g., through command-and-control). However, the exact approach to be taken is currently under development. The ARB's regulations are likely to address emissions not only from the newer, more efficient, and lower emitting facilities licensed by the Energy Commission, but also from the older, higher-emitting facilities not subject to any GHG reduction standard that the Energy Commission could presently impose. This programmatic approach is likely to be more effective in reducing GHG emissions overall from the electricity sector than one that merely relies on displacing out-of-state coal plants ("leakage") or older "dirtier" facilities.

The Energy Commission and the Public Utilities Commission provided recommendations (CPUC 2008) to ARB on how to achieve such reductions through both programmatic and regulatory approaches and identified the regulation points for the ARB implementation of a multi-sector cap-and-trade system. As ARB improves the GHG inventories and methods, it may become apparent that emission reductions from the generation sector are less cost-effective than other sectors, and that other sectors of sources can achieve reductions with relative ease and cost-effectiveness.

The project would be subject to ARB's mandatory reporting requirements and potentially other future requirements mandating compliance with AB 32 that are being developed by ARB. How the project would comply with these ARB requirements is speculative at this time, but compliance would be mandatory. The ARB's mandatory GHG emissions reporting requirements do not indicate whether the project, as defined, would comply with the potential GHG emissions reduction regulations being formulated under AB 32. The project may have to provide additional reports and GHG reductions, depending on the future regulations expected from ARB. Similarly, this project would be subject to federal mandatory reporting of GHG.

Reporting of GHG emissions would enable the project to demonstrate consistency with the policies described above and the regulations that ARB adopts and to provide the information to demonstrate compliance with any applicable EPS that could be enacted in the next few years. The OGS project would comply with the limits of the Greenhouse Gas Emission Performance Standard (Title 20, California Code of Regulations, section 2900 et seq.; SB 1368) that applies to utility purchases of base load power from power plants.

The Energy Commission established a precedent decision in the Final Commission Decision for the Avenal Energy Project (CEC 2009e). This decision requires all new natural gas fired power plants certified by the Energy Commission to: (a) not increase the overall system heat rate for natural gas plants, (b) not interfere with generation from existing renewable facilities nor interfere with the integration of new renewable generation, and (c) take into account these factors to ensure a reduction of system-wide GHG emissions and support the goals and policies of AB 32 (CEC 2009e). The OGS project, with its low heat rate and high flexibility, rapid start and fast ramping capabilities, would satisfy these conditions.

NOTEWORTHY PUBLIC BENEFITS

Electricity is produced by operation of inter-connected generation resources and, by knowing the fuel used by the generation sector, the resulting GHG emissions can be known. The operation of OGS would affect the overall electricity system operation and GHG emissions in several ways:

- OGS would provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation.
- OGS would displace some less efficient and less flexible local generation in the dispatch order of gas-fired facilities that are required to provide electricity reliability in California and the overall Western Electricity Coordinating Council electric transmission system.
- OGS would facilitate to some degree the replacement of out-of-state coal electricity generation that must be phased out in conformance with the State's Greenhouse Gas Emissions Performance Standard.
- OGS would facilitate the replacement of generation provided by power plants that are aging and/or using once-through cooling.

The project would likely lead to a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state's power plants, would not worsen current conditions, would not increase the overall system heat rate for natural gas-fired power plants, and would thus not result in impacts that are cumulatively significant. Moreover, it would be consistent with AB 32 goals.

The energy displaced by the proposed OGS would result in a reduction in GHG emissions from the electricity system compared to other comparable non-renewable base load or intermediate energy resources. In other system roles, as described in **Greenhouse Gas Table 8**, the proposed OGS would be able to minimize its GHG impacts by filling most of the expected future roles for gas-fired generation, in a high-renewables, low-GHG system.

Greenhouse Gas Table 8
OGS, Summary of Role in Providing Energy and Capacity Resources

Services Provided by Generating Resources	Discussion, Oakley Generating Station
Integration of Renewable Energy	• Would provide fast startup capability (within 2 hours). • Would provide rapid ramping capability. • Would have ability to provide regulation and reserves, and energy when renewable resources are unavailable.
Local Generation Displacement	• Would be able to satisfy/partially satisfy local capacity area (LCA) resource requirements. • Would provide voltage support. • *Would not* provide black start capability.
Ancillary Services, Grid System, and Emergency Support	• Would provide fast startup capability (within 2 hours). • Would have low minimum load levels. • Would provide rapid ramping capability. • Would have ability to provide regulation and reserves. • *Would not* provide black start capability.
General Energy Support	• Would provide general energy support. • Could facilitate some retirements and replacements. • Would provide cost-competitive energy. • Would be able to help a load-serving entity (LSE) meet resource adequacy (RA) requirements.

Source: Energy Commission staff; based on: Expected Roles for Gas-Fired Generation (CEC2009b, p. 7).

CONCLUSIONS

OGS would be an efficient, new, highly dispatchable natural gas-fired combined-cycle power plant that would cause GHG emissions while generating electricity for California consumers. AB 32 emphasizes that GHG emission reductions must be "big picture" reductions that do not lead to "leakage" of such reductions to other states or countries. The project's GHG emissions per MWh would be lower than those of other base-load

generation that the project would displace, and it offers superior operating flexibility and, thus, the OGS would contribute to continued improvement of the California and overall Western Electricity Coordinating Council system's GHG emissions and GHG emission rate average.

The project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state's power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant.

Staff notes that mandatory reporting of GHG emissions per federal and Air Resources Board greenhouse gas regulations would occur. This enables the ARB to gather the information needed to regulate the OGS in trading markets if required by the regulations implementing the California Global Warming Solutions Act of 2006 (AB 32). The project may be subject to additional reporting requirements and GHG reduction or trading requirements as these regulations are implemented by ARB and U.S. EPA.

Staff does not believe that the minor GHG emission increases from construction activities would be significant for several reasons. First, the period of construction would be short-term and the emissions intermittent during that period, not ongoing during the life of the project. Additionally, control measures, or best practices, that staff recommends for minimizing criteria pollutants, such as limiting construction vehicle idling times and requiring, as appropriate, equipment that meets the latest emissions standards, would further minimize greenhouse gas emissions since staff believes that the use of newer equipment would increase fuel efficiency and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment. For all these reasons, staff concludes that the short-term emission of greenhouse gases during construction would be substantially reduced and would, therefore, not be significant.

The OGS project would comply with the limits of the Greenhouse Gas Emission Performance Standard (Title 20, California Code of Regulations, section 2900 et seq.; SB 1368) that applies to utility purchases of base load power from power plants.

The OGS project would be consistent with the precedent decision regarding GHG emissions established by the Avenal Energy Project's Final Commission Decision (CEC 2009e).

PROPOSED CONDITIONS OF CERTIFICATION

None proposed. The project owner would comply with mandatory ARB GHG emissions reporting regulations (California Code of Regulations, tit. 17, section 95100 et. seq.) and/or future GHG regulations formulated by the ARB and U.S. EPA, such as limits set by GHG emissions cap-and-trade markets.

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BIOLOGICAL RESOURCES

Ann Crisp and Heather Blair

SUMMARY OF CONCLUSIONS

The proposed Oakley Generating Station (OGS), formerly known as Contra Costa Generating Station, would occupy a 21.95 acre parcel of which 17.1 acres would be permanently disturbed; 13.9 acres are currently a vineyard. The project site is located in an area primarily surrounded by heavy industry including a former DuPont manufacturing site to the north, the Atchison, Topeka, and Santa Fe railroad to the south, and the PG&E Antioch Terminal to the west. The potential for the project area to support sensitive biological resources is moderate; the immediate vicinity supports wildlife that is likely habituated to frequent disturbance.

Participation in the East Contra Costa Habitat Conservation Plan and Natural Community Conservation Plan (ECCC HCP/NCCP) would provide take authorization of covered species under the federal Endangered Species Act and the Natural Community Conservation Planning Act for impacts associated with development of the project. The project would mitigate for 17.1 acres of permanent impacts and 0.3 acre of temporary impacts (i.e. temporary and permanent habitat loss) through the ECCC HCP/NCCP. Mitigation fees for permanent impacts and temporary impacts include payment of development fees to the East Contra Costa County Habitat Conservancy (Conservancy). Development fees are assessed based on the acreage of land permanently and temporarily disturbed. The one-time development fee for this project would be approximately $230,081, or as adjusted by the Conservancy pending the Annual Adjustment of mitigation fees (CH2MHILL 2010s). These fees have not yet been finalized. Areas categorized as urban as well as areas which will be protected by wildlife exclusion fencing and silt fencing during construction are exempt from paying mitigation fees. The one-time payment to the Conservancy would mitigate for loss of vegetation as the fees go toward purchasing land/habitat for all species covered under the ECCC HCP/NCCP permit, as part of the core conservation strategy of the ECCC HCP/NCCP. The one-time payment to the Conservancy is the primary mitigation fee for the development of areas which are removed from an undeveloped or habitat-providing state (CH2MHILL 2010k).

Staff received a copy of the draft Planning Survey Report (PSR) from the applicant that was prepared in coordination with the Conservancy (CH2MHILL 2010s); the final PSR is still in development therefore the required mitigation measures required by the Conservancy are subject to modification (Hinojosa pers comm.). Energy Commission staff have reviewed and incorporated relevant technical information from the PSR into this Preliminary Staff Assessment (PSA), as appropriate. Energy Commission staff agree with the proposed mitigation for species to be covered under the ECCC HCP/NCCP and have incorporated the Conservancy's measures into staff's proposed conditions of certification.

Impacts to special-status species associated with the OGS, beyond temporary and permanent habitat loss, include but are not limited to potential loss of dens and nesting habitat in the OGS site and linear routes, disturbance to breeding or nesting animals in

habitat adjacent to the OGS site and linear routes, and disturbance impacts from construction and operation noise and lighting. Direct impacts to the majority of special-status species would be avoided and minimized by conducting comprehensive pre-construction surveys and erecting wildlife exclusion fencing before site mobilization. Impact avoidance and minimization measures described in staff's analysis and included in the proposed conditions of certification would help reduce impacts to sensitive biological resources. With implementation of applicant-proposed impact avoidance and minimization measures and staff's proposed conditions of certification, direct impacts to biological resources would likely be less than significant. These measures along with the mitigation provided by participation in the ECCC HCP/NCCP would likely offset project related losses to biological resources to less-than-significant levels.

Indirect impacts to the nearby Antioch Dunes National Wildlife Refuge (NWR) would result from nitrogen deposition caused by OGS emissions. The Antioch Dunes NWR contains the last known populations of the federally endangered Lange's metalmark butterfly, federally and state endangered Antioch Dunes evening primrose, and federally and state endangered Contra Costa wallflower. The greatest threat to these listed species is noxious weed invasion and the resultant cascading effects (e.g., competition, wildfire). Noxious weed proliferation is exacerbated by nitrogen deposition. Because the Antioch Dunes NWR is already experiencing habitat degradation likely caused by nitrogen deposition and fertilization, additional nitrogen deposition from OGS at this already stressed ecosystem would be a significant impact.

Recognizing that the proposed OGS would not be the only contributor of nitrogen at Antioch Dunes NWR, staff recommends that the applicant remit annual payment toward the operating budget of Antioch Dunes NWR that is proportional to the project's share of total nitrogen deposition. It is staff's determination that implementation of the management activities funded by this annual payment toward the operating budget of Antioch Dunes NWR (as described in **BIO-19** (Antioch Dunes National Wildlife Refuge Funding)) would mitigate adverse impacts to Antioch Dunes NWR and the Antioch Dunes evening primrose, Contra Costa wallflower, and Lange's metalmark butterfly from noxious weed proliferation exacerbated by OGS's contribution to nitrogen deposition. Indirect and cumulative impacts would be less than significant with mitigation.

With implementation of applicant-proposed impact avoidance and minimization measures and staff's proposed conditions of certification, the project would be in compliance with most federal, state, and local laws, ordinances, regulations, and standards (LORS) relating to biological resources. LORS compliance is currently undetermined for the federal Endangered Species Act, Bald and Golden Eagle Protection Act, California Endangered Species Act, California Code of Regulations (Title 14, sections 670.2 and 670.5), Natural Communities Conservation Planning Act (NCCPA) of 2002, East Contra Costa County Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP), City of Oakley Tree Preservation Ordinance, and the City of Antioch Tree Preservation Ordinance. Based on the information provided to date, staff anticipates compliance with the above-listed LORS will be achieved through participation in the ECCC HCP/NCCP and implementation of mitigation measures required as part of participation in the ECCC HCP/NCCP as well as payment of required fees to the City of Oakley and City of Antioch for removal of

protected trees. Staff is continuing to work with the applicant and the Conservancy to resolve any outstanding information needs prior to publication of the Final Staff Assessment (FSA). This includes the following:

- The revised calculations of impact fees to be paid to the ECCC HCP/NCCP and any modifications to mitigation measures to be included in the Final Planning Survey Report (PSR);
- Arborist report, including updated tree survey results, which would be used to determine fees to be paid to the City of Oakley and City of Antioch for removal of protected trees.

Any additional requirements within the PSR will be reviewed and incorporated into staff's Final Staff Assessment (FSA), as appropriate. Additional conditions of certification or modifications to currently proposed conditions of certification are likely based on resolution of the outstanding items described above and will be included in the FSA.

INTRODUCTION

This section provides the California Energy Commission (Energy Commission) staff's analysis of potential impacts to biological resources from the construction and operation of the Oakley Generating Station (OGS). This analysis addresses potential impacts to special-status species, wetlands and other waters of the U.S., and areas of critical biological concern. Information contained in this document includes a detailed description of the existing biotic environment, an analysis of potential impacts to biological resources and, as necessary, specifies mitigation measures (conditions of certification) to reduce potential impacts to less-than-significant levels. Additionally, this analysis assesses compliance with applicable laws, ordinances, regulations, and standards (LORS).

This analysis is based, in part, on information provided in the OGS Application for Certification – Volumes 1 and 2 (OG 2009a), responses to data requests (CH2MHILL 2010d; CH2MHILL 2010g), Draft ECCC HCP/NCCP Planning Survey Report (CH2MHILL 2010s); staff's observations during field visits on December 18, 2009 and June 10, 2010, supplemental information filed by the applicant (CH2MHILL 2010t), and ongoing discussions with U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), and the East Contra Costa County Habitat Conservancy (Conservancy).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The applicant would need to abide by the LORS listed in **BIOLOGICAL RESOURCES Table 1** during project construction and operation.

BIOLOGICAL RESOURCES Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
Clean Water Act of 1977 (Title 33, United States Code, sections 1251–1376, and Code of Federal Regulations, part 30, Section 330.5(a)(26))	Prohibits the discharge of dredged or fill material into the waters of the United States without a permit. The administering agency is the U.S. Army Corps of Engineers.
Endangered Species Act (Title 16, United States Code, sections 1531 et seq.; Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for the protection of threatened and endangered plant and animal species and their critical habitat. The administering agencies are USFWS and National Marine Fisheries Service.
Bald and Golden Eagle Protection Act (Title 16, United States Code section 668)	Provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act. The administering agency is USFWS.
Migratory Bird Treaty Act (Title 16, United States Code, sections 703–711)	Prohibits the take or possession of any migratory nongame bird (or any part of such migratory nongame bird), including nests with viable eggs. The administering agency is USFWS.
Migratory Bird Treaty Reform Act (70 F.R. 12710-12716 (March 15, 2005))	This Migratory Bird Treaty Reform Act includes a significant change to the Migratory Bird Treaty Act (MBTA). The law now excludes those species considered to be not native to the United States. The Secretary of the Interior published in the Federal Register the final list of bird species to which the MBTA does not apply. The administering agency is USFWS.
State	
California Endangered Species Act (Fish and Game Code, sections 2050 et seq.)	Protects California's rare, threatened, and endangered species. The administering agency is CDFG.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals that are classified as rare, threatened, or endangered in California. The administering agency is CDFG.
California Code of Regulations (Title 20, sections 1702(q) and (v))	Protects "areas of critical concern" and "species of special concern" identified by local, state, or federal resource agencies within the project area, including the California Native Plant Society (CNPS). The administering state agency is CDFG.
Natural Communities Conservation Planning Act (NCCPA) of 2002 (Fish and Game Code, sections 2800 through 2835)	Established the NCCPA program, which is a cooperative effort between public and private partners that uses a broad-based ecosystem approach to protecting multiple habitats and species. The administering agency is CDFG.
Fully Protected Species (Fish and Game Code,	Designates certain species as fully protected and prohibits take of such species. The administering agency is CDFG.

Applicable Law	Description
sections 3511, 4700, 5050, and 5515)	
Native Plant Protection Act (Fish and Game Code, section 1900 et seq.)	Designates rare, threatened, and endangered plants in California and prohibits the taking of listed plants. The administering agency is CDFG.
Nest or Eggs (Fish and Game Code, section 3503)	Prohibits take, possession, or needless destruction of the nest or eggs of any bird. The administering agency is CDFG.
Birds of Prey (Fish and Game Code, section 3503.5)	Specifically protects California's birds of prey in the orders Falconiformes and Strigiformes by making it unlawful to take, possess, or destroy any such birds of prey or to take, possess, or destroy the nest or eggs of any such bird. The administering agency is CDFG.
Migratory Birds (Fish and Game Code, section 3513)	Prohibits take or possession of any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird. The administering agency is CDFG.
Significant Natural Areas (Fish and Game Code section 1930 et seq.)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat. The administering agency is CDFG.
Public Resources Code, sections 25500 and 25527	Prohibits siting of facilities in certain areas of critical concern for biological resource, such as ecological preserves, refuges, etc. The administering agency is the Energy Commission (with comment from CDFG).
Local	
East Contra Costa County Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP)	Provides for the protection of natural resources, while streamlining the environmental permitting process for impacts on endangered species; provides take authorization under the federal Endangered Species Act and Natural Community Conservation Planning Act (NCCPA) for covered species; and provides for species, wetland, and ecosystem conservation contributing to endangered species recovery. The OGS project is a covered activity eligible to seek take coverage through the ECCC HCP/NCCP. Not all state and federally listed species that could be impacted by the OGS project are covered by the ECCC HCP/NCCP (i.e. state and federally listed species which occur at the Antioch Dunes NWR are not covered under the ECCC HCP/NCCP).
City of Oakley General Plan	Provides a planning framework for preservation of important ecological and biological resources in consideration of providing adequate resources and infrastructure for projected population growth. The OGS site is within the jurisdiction of the City of Oakley, however 1.4 miles of the 2.4-mile proposed transmission line route is within the City of Antioch.
City of Oakley Tree Preservation Ordinance	Provides for the preservation of certain protected trees in the City of Oakley. Provides for the protection of trees on private property by controlling tree removal while allowing for reasonable enjoyment of private property rights and property development.
City of Antioch General Plan – Resource Management Element	Provides a planning framework for protection of conservation of resources and preservation of open space in consideration of providing adequate resources and infrastructure for projected population growth. The OGS site is not within the jurisdiction of

Applicable Law	Description
	the City of Antioch, however 1.4 miles of the 2.4-mile proposed transmission line route is within the City of Antioch.
City of Antioch Tree Preservation Ordinance	Provides for the preservation of certain protected trees in the City of Antioch. Provides for the protection of trees with the goal of retaining as many trees as possible while recognizing individuals' property rights.

SETTING

REGIONAL SETTING

The proposed OGS project site is located in the northwestern corner of the City of Oakley, Contra Costa County, California, immediately northeast of the City of Antioch and just east of State Route 160. The proposed project is also located within the East Contra Costa County HCP/NCCP (ECCC HCP/NCCP) Planning Area which covers approximately 175,000 acres in eastern Contra Costa County (ECCCHCPA 2006). As proposed, OGS will be located approximately 0.6 mile from the southern bank of the San Joaquin River, approximately six miles southeast of its confluence with the Sacramento River. Regionally, the confluence of these two major river systems comprise the Sacramento-San Joaquin River Delta, which extends east from Suisun Bay, north to the city of Sacramento and east to the city of Stockton. The brackish and slow flowing water in this region is due to a mixture of saltwater inflow from the San Francisco Bay and freshwater outflow from the Sacramento and San Joaquin rivers and creates productive and biologically diverse habitat. The Sacramento-San Joaquin River Delta is the largest estuary on the Pacific coast of the United States. It encompasses approximately 1,600 square miles, drains over 40 percent of the State of California, and provides habitat for numerous species of fish and wildlife, including many federally and state listed species. Two-thirds of salmon that migrate into California pass through the Delta, as do nearly half the migrating waterfowl and shorebirds (USFWS 2001a).

Significant ecological areas within five miles of the proposed OGS include the following (CCCCDD 2005; OG 2009a):

- **DOW Wetlands Preserve.** Comprises over 400 acres and supports known populations of at least three listed species, including the federally and state endangered salt marsh harvest mouse (*Reithrodontomys raviventris*).
- **Kimball Island.** Includes a 109-acre preserve/mitigation bank with diverse aquatic, wetland, and riparian habitats including riverine aquatic bed, riparian forest, tidal perennial marsh, and shaded riverine aquatic.
- **Sherman Island Waterfowl Management Area.** Comprises over 3,000 acres of natural marsh and open delta water. Supports six known populations of special-status plant and wildlife species.
- **Antioch Dunes National Wildlife Refuge.** Contains the only remaining remnants of riverine dunes, which originally covered 10 miles of the southern shore of the San Joaquin River. Supports 14 special-status and/or endemic species, including the last known natural populations of Lange's metalmark butterfly (*Apodemia mormo langei),*

Antioch Dunes evening primrose *(Oenothera deltoides ssp. howellii)*, and Contra Costa wallflower (*Erysimum capiatum var. angustatum*).

- **Big Break.** This emergent marsh supports the federal and state endangered California black rail (*Laterallus jamaicensis coturniculus*).
- **East Bay Regional Park District Legless Lizard Preserve.** Comprises a 7.5-acre site which includes disturbed tree-covered inland dune habitat. Supports silvery legless lizard (*Anniella pulchra pulchra*), a state species of special concern.

PROJECT AREA AND VICINITY DESCRIPTION

The project area consists of the proposed OGS power plant site (OGS site), laydown area, stockpile areas, and all associated linear facilities (i.e., electrical transmission lines, sanitary sewer force main, and gas supply pipeline). The OGS site would occupy approximately 21.95 acres; however an existing 1.60-acre conservation easement area with a 0.62-acre wetland occurs in this area but would not be disturbed. In addition, an approximately 0.6-acre linear area of mature Tasmanian blue gum trees (*Eucalyptus globulus*) would not be disturbed, excluding a 25-foot segment that would be removed to incorporate a roadway between the project site and the construction laydown area. Several native and ornamental trees would also be removed from the project site and along the proposed transmission line corridor. The 20.2-acre construction laydown area is adjacent to and east of the OGS site. The construction laydown area includes a 6.5 acre paved area and a 13.1 acre unpaved area. Three temporary soil stockpiles totaling 7.2 acres would be located at varying distances within 1,500 feet north of the OGS site. One of these soil stockpiles, totaling 2.22 acres, would be located on an existing paved surface. The remaining two soil stockpiles, 2.68 and 2.30 acres respectively, would be located in ruderal (non-native) grassland.

The proposed OGS site is bounded to the south by the Atchison, Topeka, and Santa Fe railroad, to the west by the Pacific Gas and Electric (PG&E) Antioch Terminal (a natural gas transmission hub) and Bridgehead Road, to the north by industrial or vacant industrial property owned by DuPont, and to the east by DuPont's titanium dioxide landfill area.

PROPOSED PROJECT

The OGS project consists of various components related to the generation and transmission of electricity, including those described below. With the exception of the 2.4-mile long transmission line, the 0.44-mile long sanitary sewer force main route, and a portion of the 300-foot long natural gas pipeline connected to the adjacent PG&E Antioch Terminal, the following proposed project components would be within the proposed OGS site:

- **An Expedited Rapid Response Engineered Equipment Package** consisting of two combustion turbine-generators (each with a 155-foot-tall exhaust stack), two heat recovery steam generators, and a single condensing steam turbine generator.
- **A new OGS 230-kV switchyard** that would be connected to the 230-kV PG&E Contra Costa Substation via a proposed 2.4-mile transmission line.

- **Natural gas metering station and pipeline connection** (6- to 10-inch-diameter, approximately 300 feet long) from OGS to the adjacent PG&E gas metering yard to tap Line 303. A secondary natural gas supply pipeline would connect to PG&E's Line 400 (6- to 10- inch diameter, approximately 410 feet long), also within the adjacent PG&E gas metering yard. The metering station would be required at the OGS site to measure and record gas volumes.
- **Water supply and discharge connections** to existing onsite potable water line and new sanitary sewer pipeline. Potable water supply would be provided by Diablo Water District for process and potable uses through a tap from an existing 27-inch diameter distribution pipeline that runs north-south through the OGS site just east of the PG&E Antioch Terminal. Process and sanitary wastewater would be discharged to a new sanitary sewer force main that would extend south along Bridgehead Road from a point adjacent to the plant entrance road for 0.33 mile to Main Street. It would then turn eastward and run for 0.11 mile to the interconnection point with Ironhouse Sanitation District's gravity main.

SPECIAL MANAGEMENT AREAS

East Contra Costa County HCP/NCCP Planning Area

The proposed OGS project is within the plan area for the East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (ECCC HCP/NCCP). The East Contra Costa County Habitat Conservancy (Conservancy), the implementing entity for the ECCC HCP/NCCP, is a joint exercise of powers authority formed by the cities of Brentwood, Clayton, Oakley, and Pittsburg and Contra Costa County (collectively known as the Permittees). The ECCC HCP/NCCP provides a coordinated, regional permitting approach to conservation and regulation. The Final ECCC HCP/NCCP was published in October 2007; implementation of the ECCC HCP/NCCP allows the Permittees to control endangered species permitting for activities and projects in their jurisdictional permit area while providing comprehensive species, wetlands, and ecosystem conservation. The proposed OGS site and a portion of the transmission line lies within the City of Oakley, however, approximately 1.4 miles, including 13 of the 18 transmission towers are within the City of Antioch, which is not a Permittee. The City of Oakley recommended conditions of approval for the OGS project which include compliance with the ECCC HCP/NCCP (COO 2010a). The Conservancy has confirmed that the project is an eligible covered activity under the ECCC HCP/NCCP and the applicant may apply as a Participating Special Entity for the entire project, including the portion of the transmission line route within the City of Antioch (ECCC 2010a). A Participating Special Entity is an organization not subject to the authority of a local jurisdiction. Such organizations may include school districts, water districts, irrigation districts, transportation agencies, local park districts, geologic hazard abatement districts, or other utilities or special districts that own land or provide public services (CH2MHILL 2010s). The OGS project is anticipated to be presented by Conservancy staff to the Governing Board in early 2011. Not all state and federally listed species that could be impacted by the OGS project are covered by the ECCC HCP/NCCP (i.e. state and federally listed species which occur at the Antioch Dunes NWR are not covered under the ECCC HCP/NCCP).

Existing Vegetation and Wildlife

The applicant conducted biological field surveys within the proposed project area, which includes the OGS site, laydown area, stockpile areas, and all associated linear facilities on March 4 and April 13, 2009 and January 15, February 17, April 22, and August 5, 2010. Focused botanical surveys of the project site were conducted on March 4, 2009 and April 22, 2010. The applicant's survey of the proposed OGS site included an inventory of all plant and wildlife species observed and an assessment of potential habitat suitability for special-status species. The following description of biological resources presents the results of surveys of the OGS project area and vicinity (OG 2009a) as well as observations from staff's site visit on December 18, 2009 and June 10, 2010.

Project Site, Construction Laydown Areas, and Project Linear Routes

The proposed OGS site, construction laydown area, and soil stockpile areas are contained within a former DuPont manufacturing facility and are highly disturbed or developed due to former manufacturing operations and agricultural production as a vineyard. The 2.4-mile long transmission line would be located within an existing 80-foot-wide PG&E 60-kV right-of-way. The 0.44-mile-long sanitary sewer force main route would extend south along Bridgehead Road from a point adjacent to the plant entrance road for 0.33 mile to Main Street. It would then turn eastward and run for 0.11 mile to the interconnection point with the Ironhouse Sanitary District's gravity main (CH2MHILL 2010t). The project sanitary sewer force main would be installed within or adjacent to existing roads and interconnect with the existing force main located under the existing road. Approximately 12 trees located within the OGS site and 6 trees located within the transmission line route would be removed prior to construction. This includes six interior live oak (*Quercus wislizenii*) and six almond (*Prunus dulcis*) located within the OGS site and two interior live oak, three almond, and one ponderosa pine (*Pinus ponderosa*) located along the transmission line route (CEC 2010j).

The proposed OGS site is currently in agricultural production as a vineyard with a central cluster of six interior live oaks. An isolated wetland, known as Wetland E, is on the western end of the OGS site. The 0.62-acre wetland is within a 1.6-acre conservation easement area. The conservation easement and associated Wetland E was created in 1996 as mitigation for offsite impacts related to the fill of an isolated pond located in the parking area of the adjacent Lauritzen Yacht Harbor. The hydrology for this wetland is supported by direct precipitation and runoff from the vineyard, Bridgehead Road, and portions of the DuPont property. Based upon a review of historical aerial photographs taken between 1939 and 2005 as well as the lack of hydric soils it appears this mitigation wetland was constructed in upland habitat (CH2MHILL 2009a). The wetland is dominated by wetland species including broadleaf cattail (*Typha latifolia*) and a decadent stand of common tule (*Schoenoplectus acutus*) with arroyo willow (*Salix lasiolepis*) on the slope between the water and top of the bank. Red-winged blackbirds (*Agelaius phoeniceus*) have been observed nesting in Wetland E (Davis, pers. comm.). Wetland E is excavated below the water table and holds water year round. During the winter, water levels increase during periods of significant rainfall.

The proposed laydown area would be approximately 20.2 acres and located east of the proposed OGS site. The proposed laydown area consists of a 6.5-acre area that is

paved, and a 13.1-acre ruderal grassland dominated by ripgut brome (*Bromus diandrus*) and red-stemmed filaree (*Erodium cicutarium*), which was formerly a titanium dioxide disposal site for DuPont. A row of approximately 24 mature Tasmanian blue gum trees separates these two sections of the proposed laydown area. Approximately 25 linear feet of these trees would be removed to accommodate an access road to the OGS site (CH2MHILL 2010s). These plantings of mature eucalyptus trees are of sufficient canopy cover and height to potentially support nesting and roosting raptors and other birds such as white-tailed kite (*Elanus leucurus*) as well as bats such as the western red bat (*Lasiurus blossevillii*).

Three temporary soil stockpile areas totaling 7.2 acres would be located north of the OGS site. Stockpile area 1 would be 2.22 acres and would be located closest to the project site on an existing paved surface near the southeast corner of Bridgehead Road and Wilbur Avenue. Stockpile area 2 would be 2.68 acres and Stockpile 3 would be 2.30 acres and would be located further north between Wilbur Avenue and Lauritzen Lane east of Bridgehead Road in ruderal grassland, separated by a row of sheoaks (*Casuarina equisetifolia*). The ruderal grassland is dominated by rattail fescue (*Vulpia* myuros) and also contains species such as red maids (*Calandrinia ciliata*) and common groundsel (*Senecio vulgaris*). The ruderal grasslands may provide nesting and/or foraging habitat for sensitive species such as silvery legless lizard (*Anniella pulchra pulchra*), white-tailed kite, Swainson's hawk (*Buteo swainsoni)*, and golden eagle (*Aquila chrysaetos*).

A single-circuit 230-kilovolt (kV) transmission line would directly interconnect the proposed OGS switchyard to the existing 230-kV PG&E Contra Costa Substation. The combined length of the proposed transmission line is approximately 2.4 miles and would be placed within the existing 80-foot-wide PG&E 60-kV right-of-way. The transmission line would be supported by 95-foot-tall steel poles and would require the active replacement of 18 existing steel-lattice 60-kV towers with steel-pole structures. The existing 60-kV towers are located in a variety of land uses including industrial, vacant industrial, agricultural, commercial, residential, recreational, and ruderal grassland in vacant lots (CH2MHILL 2010s). The ruderal grassland may provide suitable habitat for the special-status species such as white-tailed kite, silvery legless lizard, western burrowing owl (*Athene cunicularia hypugaea*), and San Joaquin kit fox (*Vulpes macrotis mutica*). Of the 2.4 miles total, 1.4 miles of the proposed transmission line east from the PG&E Contra Costa Substation (13 of the 18 tower replacements) would be within the City of Antioch, which is not a Permittee of the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (ECCC HCP/NCCP). However, the applicant is applying for coverage under the ECCC HCP/NCCP for the 230-kV transmission line located within the City of Antioch as a Participating Special Entity (ECCC 2010a).

Though the proposed OGS site is mainly disturbed habitat, there is limited habitat onsite and in the project area that is capable of supporting a diverse assemblage of wildlife. Observations in the project area included various non-sensitive wildlife species such as black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Spermophilus beecheyi*), western fence lizard (*Sceloporus occidentalis*), and a variety of bird species typically found in disturbed/developed areas such as house finch (*Carpodacus mexicanus*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida*

macroura), rock dove (*Columba livia*), killdeer (*Charadrius vociferus*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), western scrub-jay (*Aphelocoma californica*), and American crow (*Corvus brachyrhynchos*). Other bird species include great blue heron (*Ardea herodias*), red-winged blackbird, cliff swallow (*Petrochelidon pyrrhonota*), barn swallow (*Hirundo rustica*), northern flicker (*Colaptes auratus*), Bullock's oriole (*Icterus bullockii*), meadowlark (*Sturnella neglecta*), red-shouldered hawk (*Buteo lineatus*), and red-tailed hawk (*Buteo jamaicensis*).

Special-Status Species

Special-status species are plant and wildlife species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and typically require unique habitat conditions. Special-status species are defined as meeting one or more of the following criteria:

- Listed as threatened or endangered or candidates for future listing as threatened or endangered under the California Endangered Species Act or Federal Endangered Species Act;
- Protected under other regulations (e.g. Migratory Bird Treaty Act);
- Listed as species of concern by CDFG;
- A plant species considered by the CNPS to be "rare, threatened, or endangered in California" (CNPS List 1A, 1B, and 2);
- Plants listed as rare under the California Native Plant Protection Act;
- Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region or is so designated in local or regional plans, policies, or ordinances; or
- Any other species receiving consideration during environmental review under CEQA.

Special-status plant species were not observed within the OGS project area during biological surveys and the proposed project site does not provide suitable habitat for special-status plant species. This is primarily due to the high level of disturbance and lack of natural habitats in and around the OGS project site. However, Swainson's hawk (State Threatened), was observed foraging above grasslands located near the soil stockpile areas during field surveys (OG 2009a) and a white-tailed kite nest (State Fully Protected) was detected approximately 350 feet north of the transmission line corridor during spring 2010 surveys (CH2MHILL 2010s).

Biological Resources Table 2 identifies the special-status species that were reported to occur or potentially occur within five miles of the project area, based on surveys of the proposed project area and vicinity, and searches of the California Natural Diversity Database (CNDDB) (CDFG 2010) and California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants (CNPS 2010). The CNDDB is a program that inventories the status and locations of rare plants and animals in California. A lack of suitable, natural habitat in the project area reduces the likelihood of occurrence of the majority of these species. Reasons for their inclusion in Biological Resources Table 2

are provided in the table. Species with a moderate to high potential to occur in the proposed project area are discussed in more detail below **Biological Resources Table 2**. Species which were identified in the AFC as potentially occurring in the proposed project area were excluded from discussion in the PSA if it was determined that the OGS project area was not within the known range of the species.

BIOLOGICAL RESOURCES Table 2
Special-status Species Potentially Occurring in OGS Project Area and Vicinity

Species	Status[1]	Habitat	Potential to Occur
Plants			
Large-flowered fiddleneck *Amsinckia grandiflora*	FE;SE;1B.1	Cismontane woodland, valley and foothill grassland; elevation 900–1,800 feet; blooms April–May	**Absent:** Suitable habitat does not occur on site or adjacent to project area
Mt. Diablo manzanita *Arctostaphylos auriculata*	1B.3;HCP	Inland dunes; elevation 440–2,130 feet; blooms March–September	**Absent:** Suitable habitat does not occur on site or adjacent to project area.
San Joaquin spearscale *Atriplex joaquiniana*	1B.2	Alkaline areas within playas, chenopod scrub, meadow and seep, and valley and foothill grassland; elevation 0–2,130 feet; blooms April–October	**Absent:** Suitable habitat does not occur on site or adjacent to project area.
Big tarplant *Blepharizonia plumosa*	1B.1;HCP	Valley and foothill grassland; elevation 100–1,660 feet ; blooms July–October	**Absent:** Marginal habitat occurs onsite; not observed during surveys
Soft bird's-beak *Cordylanthus mollis* ssp. *mollis*	FE;SR;1B.2	Coastal salt marshes and swamps; elevation 0–10 feet; blooms July–November	**Absent:** Suitable habitat does not occur on site or adjacent to project area.
Hoover's cryptantha *Cryptantha hooveri*	1A	Inland dunes and sandy areas within valley and foothill grasslands; elevation 30–490 feet; blooms April–May	**Low:** Marginal habitat occurs onsite; nearest record is from 1908 and located 3 miles from site; presumed extinct in California.
Mt. Diablo buckwheat *Eriogonum truncatum*	1B.1	Sandy areas within chaparral, coastal scrub, valley and foothill grassland; elevation 0–1,150 feet; blooms April–September	**Low:** Marginal habitat occurs onsite; not observed during surveys
Antioch Dunes buckwheat *Eriogonum nudum var. psychicola*	1B.1	Inland dune habitat within coastal grassland communities; elevation 10–65 feet; blooms July–October	**Absent:** Suitable habitat does not occur onsite or adjacent to project area; currently only know from Antioch Dunes NWR
Round-leaved filaree *California macrophylla* (=*Erodium macrophyllum*)	1B.1;HCP	Cismontane woodland, valley and foothill grassland; friable clay soils; elevation 50–3,940 feet; blooms March–May	**Absent:** Marginal habitat occurs onsite; not observed during surveys
Contra Costa wallflower *Erysimum capitatum* var. *angustatum*	FE;SE;1B.1	Inland dunes; elevation 0–70 feet; blooms March-July	**Absent:** Suitable habitat does not occur onsite or adjacent to project area; currently only know from Antioch Dunes NWR[2]
Diamond-petaled California poppy *Eschscholzia rhombipetala*	1B.1	Valley and foothill grassland; 0–3,200 feet; blooms March–April	**Low:** Marginal habitat occurs onsite; not observed during surveys

Species	Status[1]	Habitat	Potential to Occur
Brewer's western flax *Hesperolinon breweri*	1B.2;HCP	Chaparral, cismontane woodland, ultramafic, valley and foothill grassland; dry hill or canyon sides, grassy opens amongst oaks or brush; elevation 100–2,950 feet; blooms May–July	**Absent:** Marginal habitat occurs onsite; not observed during surveys
Wooly rose-mallow *Hibiscus lasiocarpus* var. *occidentalis*	1B.2	Freshwater marsh and swamps; in California, known from the Delta watershed; elevation 0–390 feet; blooms June–September	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Contra Costa goldfields *Lasthenia conjugens*	FE; 1B.1	Mesic areas within cismontane woodland, valley and foothill grassland, vernal pool, wetland; elevation 0–1,540 feet; blooms March–June	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	1B.2	Freshwater and brackish marshes and swamps; elevation 0–10 feet; blooms May– July	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Mason's lilaeopsis *Lilaeopsis masonii*	SR; 1B.1	Brackish or freshwater marshes and swamps; elevation 0–330 feet; blooms April–November	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Delta mudwort *Limosella subulata*	2.1	Brackish and freshwater marshes and swamps; elevation 0–10 feet; blooms May–August	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Antioch Dunes evening-primrose *Oenothera deltoides* ssp. *howellii*	FE; SE; 1B.1	Inland dunes; elevation 0–100 feet; blooms March–September	**Absent:** Suitable habitat does not occur onsite or adjacent to project area; currently only know from Antioch Dunes NWR[2]
Suisun marsh aster *Symphyotrichum lentum*	1B.2	Brackish and freshwater marsh; elevation 0–10 feet; blooms May–November	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Invertebrates			
Lange's metalmark butterfly *Apodemia mormo langei*	FE	Stabilized dunes along the San Joaquin River; endemic to Antioch Dunes	**Absent:** Suitable habitat does not occur onsite or adjacent to site; currently only know from Antioch Dunes NWR[2]
Vernal pool fairy shrimp *Branchinecta lynchi*	FT; HCP	Vernal pools; also may occur in manmade seasonal water sources such as road side ditches and stock ponds	**Absent:** Suitable habitat does not occur onsite or adjacent to site
valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Elderberry shrubs throughout the Central Valley and foothills below 3,000 feet elevation	**Absent:** Suitable habitat does not occur onsite or adjacent to site
Antioch efferian robberfly *Efferia antiochi*	—	Interior sand dunes; known only from Fresno and Contra Costa Counties	**Absent:** Suitable habitat does not occur onsite or adjacent to site
Curved-foot hygrotus diving beetle *Hygrotus curvipes*	—	Alkali vernal pools and other seasonal wetlands or slow-moving streams with pools and fringed with alkali vegetation	**Absent:** Suitable habitat does not occur onsite or adjacent to site
Middlekauff's shieldback katydid *Idiostatus middlekauffi*	—	Interior sand dunes, known only from Antioch Dunes	**Absent:** Suitable habitat does not occur onsite or adjacent to site
Vernal pool tadpole shrimp *Lepidurus packardi*	FE; HCP	Vernal pools and ephemeral wetland habitats with clear to highly turbid water	**Absent:** Suitable habitat does not occur onsite or adjacent to site

Species	Status[1]	Habitat	Potential to Occur
Antioch andrenid bee *Perdita scitula antiochensis*	—	Interior sand dunes, known only from Antioch Dunes and Oakley	**Absent:** Suitable habitat does not occur onsite or adjacent to site
Fish			
Green sturgeon *Acipenser medirostris*	FT; CSC	Aquatic, Klamath/North coast flowing waters, Sacramento/San Joaquin flowing waters	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Sacramento perch *Archoplites interruptus*	CSC	Aquatic, sloughs, slow-moving rivers, lakes of central valley	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Delta smelt *Hypomesus transpacificus*	FT; ST	Aquatic, Estuary	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Central Valley steelhead *Oncorhynchus mykiss irideus*	FT	Aquatic, Sacramento/San Joaquin flowing waters	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Central Valley spring-run, winter-run chinook salmon *Oncorhynchus tshawytscha*	FT; FE/ ST;SE	Aquatic, Sacramento/San Joaquin flowing waters	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Longfin smelt Spirinchus thaleichthys	ST; CSC	Aquatic, San Francisco Estuary and the Sacramento-San Joaquin Delta north to near Oregon border	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Amphibians			
California tiger salamander *Ambystoma californiense*	FT;CSC;ST; HCP	Prefer natural ephemeral pools or ponds that mimic them (stock ponds that are allowed to go dry). They may use permanent ponds with no fish predators. Need underground refuges, especially ground squirrel burrows	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
California red-legged frog *Rana draytonii*	FT; CSC; HCP	Permanent and semi-permanent aquatic habitats; may aestivate in rodent burrows or cracks	**Moderate:** May occur in East Antioch Creek, project site does not support appropriate habitat
Reptiles			
Western pond turtle *Actinemys marmorata*	CSC; HCP	Occurs in perennial wetlands and slow moving creeks and ponds that support overhanging vegetation and rock outcrops or floating debris for basking	**Moderate:** East Antioch Creek may provide suitable movement habitat for the species across the project site
Silvery legless lizard *Anniella pulchara pulchara*	CSC; HCP	Sandy or loose loamy soils under sparse vegetation of beaches, chaparral, or pine-oak woodland; soil moisture is essential; rocky soils or areas disturbed by agriculture, sand mining, or other human uses are not suitable	**Moderate:** Ruderal grassland areas on project site provide low to moderate suitable habitat for the species
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT;CT;HCP	Mixed chaparral, coastal scrub, and annual grassland and oak woodlands that are adjacent to scrub habitats, require rock outcrops with deep crevices or abundant rodent burrows	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
Coast horned lizard *Phrynosoma coronatum* (*frontale* population)	CSC	Grasslands, coniferous forests, woodlands, and chaparral on exposed sandy gravelly substrate with scattered shrubs, and clearings	**Low**: Marginal suitable habitat occurs onsite however the species is not known from project area or vicinity; not observed onsite

Species	Status[1]	Habitat	Potential to Occur
Giant garter snake *Thamnophis gigas*	FT; ST;HCP	Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, and rice fields; use upland habitat with grassy banks and openings to waterside vegetation for basking	**Moderate:** Suitable upland habitat occurs along East Antioch Creek where creek intersects with the transmission line right-of-way
Birds			
Tricolored blackbird *Agelaius tricolor*	CSC; HCP	Breeds near freshwater, preferably in emergent wetland with tall dense cattails or tules, but also in willow, blackberry, wild rose, and tall herbs in general with a minimum patch size of 40 acres; forages in grassland and cropland in the Central Valley and on the coast.	**Low:** Marginal suitable habitat occurs onsite; not known from project area or vicinity
Grasshopper sparrow *Ammodramus savannarum*	CSC	Occurs in dry, dense grasslands, with a variety of grasses and tall forbs and scattered shrubs for singing perches; prefers native grasslands	**Low:** Marginal suitable habitat occurs onsite; not known from project area or vicinity
Golden eagle *Aquila chrysaetos*	BGEPA;FP; HCP	Forage in grassy and open shrub habitats; nest primarily on cliffs, secondarily in large trees	**Moderate:** Suitable foraging habitat occurs throughout project area; not known to nest in project vicinity
Burrowing owl *Athene cunicularia hypugaea*	CSC;HCP	Sparse grassland, open desert scrub, and agriculture lands; strongly associated with ground squirrel burrows	**Moderate:** Not observed in project area; suitable habitat for foraging and nesting (ground squirrel burrows) occurs along transmission line route; known to occur in vicinity of transmission line corridor
Swainson's hawk *Buteo swainsoni*	ST;HCP	Occur in wide variety of open habitats; suitable habitat consists of suitable nest trees and proximity to high-quality foraging habitat	**Present:** Nesting trees (eucalyptus trees) and foraging habitat present onsite; observed foraging in grasslands near soil stockpiles during surveys
Northern harrier *Circus cyaneus*	CSC	Meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands	**Moderate:** Suitable foraging habitat occurs throughout project area; not known to nest in project vicinity
White-tailed kite *Elanus leucurus*	FP	Open woodland, marshes, partially cleared lands and cultivated fields, mostly in lowland situations.	**Present:** Nest observed approximately 300 feet from transmission line corridor during surveys
Peregrine falcon *Falco peregrinus*	SE;FP	Breeds in woodlands, forests, coastal habitats and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, or mounds.	**Low:** Marginal suitable habitat occurs onsite; not known from project area or vicinity
Bald eagle *Haliaeetus leucocephalus*	BGEPA;FP	Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches.	**Low:** Marginal foraging habitat occurs onsite; not known from project area or vicinity

Species	Status[1]	Habitat	Potential to Occur
Yellow-breasted chat *Icteria virens*	CSC	Riparian thickets of willow and tangled brush, such as blackberry.	**Low:** Marginal suitable habitat along East Antioch Creek; not known from project area or vicinity
California black rail *Laterallus jamaicensis coturniculus*	ST;FP	Saline, brackish, and fresh emergent marshes usually dominated by dense pickleweed; away from tidal areas marshes are characterized by water depths of less than 1.2 inches that do not fluctuate during the year	**Low:** Marginal suitable habitat occurs onsite; Wetland E does not provide suitable aquatic habitat as water depths fluctuate with rainfall and the average depth is 1 foot.
Loggerhead shrike *Lanius ludovicianus*	CSC	Shrublands and open woodland with bare ground or sparse herbaceous cover; require tall trees or shrubs for hunting perches (also use powerlines or fences)	**Moderate:** Suitable nesting and foraging habitat occurs onsite
Song sparrow "Modesto" population *Melospiza melodia*	CSC	Emergent freshwater marshes dominated by tules and cattails and riparian areas.	**Moderate:** Marginal habitat occurs onsite at Wetland E Conservation Easement and along East Antioch Creek
Suisun song sparrow *Melospiza melodia maxillaris*	CSC	Tidal marshes of Suisun Bay; requires dense vegetation for nesting and cover.	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
California least tern *Sternula antillarum browni*	FE; SE; FP	Colonial breeder on bare or sparsely vegetated, flat, substrates including sand beaches, alkali flats, landfills, or pave areas.	**Low**: Marginal suitable habitat occurs onsite; not observed onsite
Yellow-headed blackbird *Xanthocephalus xanthocephalus*	CSC	Fresh emergent wetland with dense vegetation and deep water, often along borders of lakes or ponds.	**Low**: Marginal suitable habitat occurs onsite; not observed onsite
Mammals			
Pallid bat *Antrozous pallidus*	CSC	Inhabits grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests. Typically roosts in caves, crevices, or mines.	**Moderate:** Suitable roosting and foraging habitat occurs onsite
Western red bat *Lasiurus blossevillii*	CSC	Roosts primarily in trees, less often in shrubs; often in edge habitats adjacent to streams, fields, or urban areas.	**Moderate:** Suitable roosting and foraging habitat occurs onsite
San Joaquin pocket mouse *Perognathus inornatus inornatus*	—	Shrubby ridge tops and hillsides within coastal scrub and valley and foothill grassland.	**Low**: Marginal suitable habitat occurs onsite; not observed onsite
Salt-marsh harvest mouse *Reithrodontomys raviventris*	FE;SE;FP	Saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat, requires higher upland areas to escape flood waters	**Absent:** Suitable habitat does not occur onsite or adjacent to project area
American badger *Taxidea taxus*	CSC	Open arid habitats, grasslands, savannas, mountain, meadows, and open areas of desert scrub with friable soils and relatively open, uncultivated ground.	**Moderate:** Suitable habitat occurs on site; nearest record is 5 miles south of project area
San Joaquin kit fox *Vulpes macrotis mutica*	FE;ST;HCP	Grasslands, scrublands, vernal pool areas, alkali meadows and playas, and agricultural areas and	**Moderate:** Suitable habitat occurs onsite; project site within the known range;

Species	Status[1]	Habitat	Potential to Occur
		grazed annual grasslands; prefer habitats with loose-textured soils.	potential burrow observed near laydown area

1 **Status Legend** (Federal/State/California Native Plant Society (CNPS) lists, CNPS list is for plants only): **FE** = Federally listed Endangered; **FT** = Federally listed Threatened; **FC** = Candidate Species for Listing; **BGEPA** = Bald and Golden Eagle Protection Act; **SE** = State-listed Endangered; **ST** = State-listed Threatened; **SCE** = State Candidate Endangered; **CSC** = California Species of Concern; **FP** = Fully Protected; **SR** = State Rare; **CNPS List 1A** = Plant presumed extinct in California; **CNPS List 1B** = Rare or Endangered in California and elsewhere; **.1** = Very endangered in California; **.2** = Rare, threatened, or endangered in California, more common elsewhere; **HCP** = covered species in the East Contra Costa County HCP/NCCP. (Sources: OG 2009a; CDFG 2010; CNPS 2010; ECCHCPA 2006).

[2] These Antioch Dunes NWR species are analyzed in the indirect impacts section of this PSA despite not occurring in the area of direct impact.

‡Definitions Regarding Potential Occurrence:

Present: Species or sign of its presence observed on the site
High: Species or sign not observed on the site, but reasonably certain to occur on the site
Moderate: Species or sign not observed on the site, but conditions suitable for occurrence
Low: Species or sign not observed on the site, conditions marginal for occurrence
Absent: Species or sign not observed on the site, conditions unsuitable for occurrence

Special-status Plants

Special-status plants are not expected to occur in the proposed project area. Several special-status plants are known to occur within the vicinity of the project, but only marginally suitable habitat exists for these species at the OGS site or along the transmission line or sanitary sewer force main route. Focused rare plant surveys conducted in March 2009 and April 2010 did not identify any special-status plants in the project area. Special-status plants occurring at the Antioch Dunes NWR, including Contra Costa wallflower and Antioch Dunes evening-primrose, would be indirectly impacted by the OGS project's NO_x emissions, as well as other sources of NO_x emissions, and resultant noxious weed proliferation resulting from nitrogen deposition.

Special-status Wildlife

The applicant conducted several site visits and surveys, including biological resource surveys in March and April 2009 and January, February, April, and August 2010 for general wildlife resources, habitat and plant community mapping, and botanical resources. The proposed project area currently provides habitat for several special-status wildlife species. Special-status species are known, presumed, or highly likely to use the project site for foraging, breeding, cover, or dispersal. By participating in the ECCC HCP/NCCP the applicant assumes presence of California red-legged frog, giant garter snake, western burrowing owl, and San Joaquin kit fox in suitable habitat and would implement the necessary impact avoidance and minimization measures to reduce impacts to these special-status species. In addition, because of observations of foraging Swainson's hawk in the grasslands adjacent to the soil stockpiles during field surveys, the project site is presumed foraging habitat for this species. These species, as well as those observed during surveys and site visits, are discussed below.

California red-legged frog (Federally Threatened, California Species of Special Concern, ECCC HCP/NCCP)

California red-legged frog breeds in ponds and still waters in the coastal foothills and agricultural areas in the proposed project area (Zeiner et al.1990). California red-legged frogs are locally abundant in some portions of the San Francisco Bay area and the Central Coast, and there are isolated occurrences in the Sierra Nevada, along the northern coast, and northern Transverse Ranges. Population declines of this species have been caused by alteration of stream and wetland habitats, use of pesticides, habitat destruction, and competition and predation of introduced species such as fish and bullfrog (Davidson et al. 2001; USFWS 2002).

California red-legged frogs require various aquatic, riparian, and upland habitats including ephemeral ponds, intermittent streams, seasonal wetlands, springs, seeps, permanent ponds, perennial creeks, manmade aquatic features, marshes, dune ponds, lagoons, riparian corridors, blackberry thickets, non-native annual grasslands, and oak savannas (USFWS 2002; Zeiner et al.1990). The presence of willows, cattails, and woody riparian vegetation are indicators of higher quality breeding habitat (USFWS 2001b; USFWS 2005). Long-term populations survival is also linked to the spatial proximity of breeding habitats so that inter-patch migration can be achieved (USFWS 2001b).

Three California Natural Diversity Database (CNDDB) occurrences exist for California red-legged frog within 5 miles of the proposed project area; however none of these CNDDB occurrences are within 1 mile of the proposed project site (CDFG 2010). This species is associated with the ECCC HCP/NCCP land cover types identified as occurring in the project site. No California red-legged frogs were detected during the biological surveys of the project site. The applicant is participating in the ECCC HCP/NCCP and as a requirement is assuming presence in suitable habitat. The project area is in the range of the California red-legged frog and the project site provides suitable dispersal and upland habitat. Based on the availability of habitat and proximity to known occurrences, this species is presumed present in the vicinity of the transmission line route at East Antioch Creek.

Western pond turtle (California Species of Special Concern; ECCC HCP/NCCP)

Western pond turtles are found throughout western California, and are associated with permanent or nearly permanent water in a variety of habitat types (Zeiner et al. 1988-1990). They require slack or slow-water aquatic habitat, both water and aerial basking sites, and shallow water with dense submergent or short emergent vegetation for hatchlings (Jennings and Hayes 1994). In addition, western pond turtles require an upland nest site for egg-laying, in the vicinity of aquatic habitat.

There are no CNDDB occurrences for this species within 1 mile of the proposed disturbance area, however there are six occurrences within 5 miles. No western pond turtles were observed during the biological surveys of the project area. This species was not associated with the ECCC HCP/NCCP land cover types identified as occurring in the project area. However, the ECCC HCP/NCCP modeled habitat distribution for western pond turtle identifies East Antioch Creek in the vicinity of the transmission line route as movement habitat and Wetland E as core habitat (ECCHCPA 2006). Based on

staff's site visit, suitable aquatic habitat for western pond turtle is not present at the Wetland E conservation easement. Average water depths are too shallow and appropriate basking sites or overhanging vegetation is not present at Wetland E. However, based upon the availability of habitat and proximity to known occurrences, this species may be present at East Antioch Creek in the vicinity of the proposed transmission line route.

Silvery legless lizard (California Species of Special Concern, ECCC HCP/NCCP)

The silvery legless lizard is found from Contra Costa County south to Baja California. They occur primarily in areas with sandy or loose loamy soils such as under sparse vegetation of beaches, chaparral, or pine-oak woodland; or near sycamores, cottonwoods, or oaks that grow on stream terraces. The species requires adequate soil moisture and rocky soils or areas disturbed by agriculture, sand mining, or other human uses are not suitable.

There are seven CNDDB occurrences for this species within 5 miles of the proposed disturbance area; three of these occurrences are within 1 mile of the proposed project site. Two of these occurrences within 1 mile are historical, one of which was last seen in 1975 and appears to be within the proposed transmission line corridor. No silvery legless lizards were detected during the biological surveys of the project site, however, this species is cryptic and generally difficult to find. This species is associated with the ECCC HCP/NCCP land cover types identified as occurring in the project area. The East Bay Regional Park District Legless Lizard Preserve is located approximately 1 mile southeast of the project site. The ruderal areas within the project site and in ruderal grassland areas along the transmission line route may provide only marginally suitable habitat for this species due to the level of prior human disturbance.

Giant garter snake (Federally Threatened, State Threatened, ECCC HCP/NCCP)

The giant garter snake is found in agricultural wetlands, canals, freshwater lakes, and low-gradient streams in the Central Valley of California. Giant garter snakes are essentially aquatic during their active period (April to October) (USFWS 2009). Between November and March, they typically hibernate in small mammal burrows or soil cracks on the banks of streams, rivers, or canals. Giant garter snakes feed on small fish and amphibians. The breeding season is typically March through April and young are born from July through September (USFWS 2009).

There is one CNDDB occurrence for this species within 5 miles of the proposed project site (CDFG 2010). No giant garter snakes were observed during the biological surveys for the project area (OGS 2009a). This species is associated with the ECCC HCP/NCCP land cover types identified as occurring in the project area. East Antioch Creek is hydrologically connected to the San Joaquin River. Suitable giant garter snake upland habitat was identified within the 200 foot buffer of East Antioch Creek in the vicinity of transmission line route (CH2MHILL 2010s).

Golden Eagle (Bald and Golden Eagle Protection Act, State Fully Protected), Loggerhead Shrike (California Species of Special Concern), Northern Harrier (California Species of Special Concern)

The golden eagle, loggerhead shrike, and northern harrier are all protected under the federal Migratory Bird Treaty Act. These birds of prey forage in ruderal areas or open agricultural lands, which occur within the project site and portions of the transmission line routes. Trees and shrubs, including those in the riparian habitat along East Antioch Creek, provide suitable nesting habitat for golden eagles and loggerhead shrikes. Ground-nesting habitat for northern harriers occurs in ruderal areas within the project site and in ruderal grassland areas along the transmission line route.

There is one CNDDB record for golden eagle within 10 miles. This species is associated with the ECCC HCP/NCCP habitat elements (e.g. large trees) identified as occurring on the project site. There is one CNDDB record for loggerhead shrike within 5 miles. There are no CNDDB occurrences for northern harrier within 10 miles of the project site; however the project site is within the species known range. None of these species were detected during biological surveys of the project site.

Swainson's Hawk (State Threatened, ECCC HCP/NCCP)

The Swainson's hawk, a state threatened species, requires large areas of open landscape for foraging, including grasslands and agricultural lands that provide low-growing vegetation for hunting and high rodent prey populations. The Swainson's hawk typically nest in large native trees such as valley oak (*Quercus lobata*), cottonwood (*Populus fremontii*), walnut (*Juglans hindsii*), and willow (*Salix* spp.), and occasionally in non-native trees, such as eucalyptus (*Eucalyptus* spp.) within riparian woodlands, roadside trees, trees along field borders, isolated trees, small groves, and on the edges of remnant oak woodlands (CDFG 1993). Foraging habitat occurs in ruderal grasslands as within the proposed project site and transmission line alignment. Suitable nest trees (e.g., mature trees) are present along the transmission line route and adjacent to the OGS project site.

There are 10 CNDDB occurrences for Swainson's hawk within 10 miles of the site (CDFG 2010), six of these occurrences are nests located within 5 miles of the project site. This species is associated with the ECCC HCP/NCCP habitat elements (e.g. trees within the species range below 200 feet in elevation) identified as occurring on the project site. One Swainson's hawk was observed during the applicant's biological surveys foraging over grasslands near the soil stockpile areas north of the proposed project site.

Burrowing owl (California Species of Special Concern, ECCC HCP/NCCP)

The burrowing owl is a yearlong resident of open, dry grassland, prairie, or desert floor habitats. Burrowing owls may be diurnal, crepuscular, or nocturnal, although hunting typically occurs at night. The burrowing owl is known to occur in urban, disturbed areas, and at the edges of agricultural fields, including orchards, and typically hunts from a perch or hops after prey on the ground. It typically nests in the vacant burrow of a ground squirrel or other small mammal although it is also known to occupy manmade structures including culverts, pipes, nest boxes, and piles of debris (CDFG 1995).

Multiple CNDDB occurrences exist within 10 miles of the proposed project site. This includes two occurrences for active burrow sites, recorded between 2004 and 2008

located north and south of the proposed transmission line route. This species is associated with the ECCC HCP/NCCP land cover types identified as occurring in the project site. While this species was not observed during surveys for the proposed project, the ruderal grasslands within the project site, including the soil stockpile locations and along the proposed transmission line routes support prey for this species including insects, small mammals, lizards, and other birds. In addition, ground squirrel burrows located on along the transmission line route provide suitable nesting opportunities (CH2MHILL 2010s).

White-tailed kite (State Fully Protected)

The white-tailed kite is a yearlong resident in Central Valley lowlands and is often found near agricultural fields where it preys on small mammals, birds, and insects. It forages in open grasslands, meadows, and open agricultural fields. Kites nest in the tops of oaks, willows, or other trees near foraging habitat (Zeiner et. al. 1988). One white-tailed kite nest was observed during the biological resource surveys approximately 350 feet north of the transmission line corridor right-of-way (CH2MHILL 2010s). The agricultural fields adjacent to the project site also provide suitable foraging habitat for this species and there are additional suitable nesting trees directly adjacent to the project site.

Song sparrow "Modesto" population (California Species of Special Concern)

The song sparrow "Modesto" population is a year-round resident in California where it resides only in the north-central portion of the Central Valley. It is found in emergent freshwater marshes dominated by tules and cattails and riparian areas. There are no occurrences for this species in CNDDB; however the project area is within the species known range. The Wetland E conservation easement area and associated wetland and riparian area along East Antioch Creek provide suitable breeding habitat for this species. This species was not detected during biological surveys of the project site

American badger (California Species of Special Concern)

American badgers were once fairly widespread throughout open grassland habitats of California but now are an uncommon permanent resident with a wide distribution across California, except from the North Coast area where they are absent. American badger is most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, parklands, and cold desert areas (Zeiner et al. 1990). Badgers inhabit burrows and often predate and forage on other small mammal burrows as evidenced by claw marks along the edges of existing burrows.

Two CNDDB occurrences exist for American badger within 5 miles of the proposed project area. While this species was not observed during surveys for the proposed project, the project area contains potential habitat in the ruderal grasslands located along the transmission line route and this species could use the large burrows detected in the proposed construction laydown area during biological resource surveys.

San Joaquin kit fox (Federal Endangered, State Threatened, ECCC HCP/NCCP)

The San Joaquin kit fox (SJKF), a federally endangered and state-threatened species, is primarily nocturnal, but are commonly seen during the day in late spring and early

summer (Orloff et al. 1986). This species typically occurs in valley and foothill grassland, or mixed shrub/grassland habitats throughout low, rolling hills and valleys and also use habitats that have been altered by humans (e.g., agricultural land, oil fields). San Joaquin kit foxes can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally within in these agricultural areas (Cypher et al 2007). Warrick et al. (2007) found that San Joaquin kit foxes in an agricultural setting typically denned in small patches of grassland but that 40-50% of their nocturnal locations were in row crops or orchards. Kit foxes change dens frequently, sometimes only using a den for two or three days. They often enlarge ground squirrel burrows for use as a den and may use vacant badger dens for shelter (USFWS 1998). Ground squirrel and other large burrows occur within the proposed project area. Loss and degradation of habitat by agricultural, industrial, and urban development and associated practices continue to decrease available habitat. Hunting, road kill, and reduction of prey populations by poisoning have contributed to the species decline (USFWS 1998). One potential kit fox burrow was found during surveys conducted in 2009 in a berm associated with the row of Tasmanian blue gum trees located near the eastern edge of the laydown area (CH2MHILL 2010s). Other large burrows were identified in the ruderal areas located adjacent to the transmission line right-of-way (CH2MHILL 2010s).

Seven CNDDB occurrences exist for SJKF within 10 miles of the proposed project area; however none of these occurrences are within 5 miles of the proposed project area (CDFG 2010). This species is associated with the ECCC HCP/NCCP land cover types identified as occurring in the project site. The project site is located near the northern end of the species range. However, the ECCC HCP/NCCP modeled habitat distribution for San Joaquin kit fox does not identify the OGS site as core habitat. While this species was not observed during surveys for the proposed project, the project area contains potential habitat in the ruderal grasslands located at the project site and along the transmission line route where this species could use the large burrows detected during biological resource surveys of the eastern edge of the proposed laydown area.

Pallid bat (California Species of Special Concern)

Pallid bats range throughout western North America, inhabiting low elevation rocky arid deserts and canyonlands, shrub-steppe grasslands, and higher elevation coniferous forests (WBWG 2005a). They are most abundant in xeric (extremely dry) ecosystems, including the Great Basin and the Mojave and Sonoran deserts. This species can be a solitary rooster, or can occupy small or large roost groups; day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, hollow trees or bark, and various human structures such as bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings (WBWG 2005a). Pallid bats are opportunistic generalists that glean a variety of arthropod prey from surfaces, but also capture insects on the wing (WBWG 2005a).

One CNDDB occurrence exists for pallid bat within 10 miles of the proposed project area. No pallid bats were observed during the surveys, but no surveys were specifically conducted for this species or any other bats. Pallid bats are known to forage over vineyards and water features and suitable roosting sites (e.g. trees) are present on site.

Western red bat (California Species of Special Concern)

The western red bat is a solitary, foliage-roosting bat locally common in some areas of California, and found from British Columbia to Central and South America. In California, this species is known to roost in cottonwood trees and willows, but is commonly detected in a variety of habitats, including chaparral. The western red bat is also known to use eucalyptus trees as day roosts (Pierson et al 2006). This species is typically solitary, roosting primarily in the foliage of trees or shrubs and may hibernate under the leaf-litter of trees during the winter (WBWG 2005b). Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas (WBWG 2005b). Western red bats may also occasionally use caves for roosts.

One CNDDB occurrences exists for western red bat within 5 miles of the project area. No western red bats were observed during field surveys, but no surveys were specifically conducted for this species or any other bats. Western red bats are known to forage over vineyards and water features and suitable roosting sites (e.g. eucalyptus trees) are present on the proposed project site.

Sensitive Habitat

Critical Habitat

Critical habitat is a formal designation under the federal Endangered Species Act. It is a specific area designated as essential to the conservation and recovery of a federally listed species. These areas may require special management consideration or protection. The Antioch Dunes National Wildlife Refuge provides critical habitat for three federally endangered species: Lange's metalmark butterfly, Antioch Dunes evening primrose, and Contra Costa wallflower (USFWS 2001c). The Sardis Unit of the Antioch Dunes National Wildlife Refuge, located in part on PG&E-owned property, is located approximately 1.6 miles west of the proposed OGS site. Additionally, the San Joaquin River provides critical habitat for delta smelt (*Hypomesus transpacificus)*, Central Valley steelhead (*Oncorhynchus mykiss)*, Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha)*, and winter-run Chinook salmon (*Oncorhynchus tshawytscha)*.

Sensitive Aquatic Habitat

Aquatic site mapping was conducted by DuPont as part of a wetland delineation study of the entire DuPont property in 2006. The wetland delineation study submitted to the USACE for jurisdictional determination included identification of five waters which were all determined to be non-jurisdictional (OG 2009a, Appendix 5.2F). This included three waters that are located on or adjacent to the proposed OGS project site. There is an isolated wetland (Wetland E) in the western portion of the OGS site, north of PG&E's Antioch Terminal and south of temporary Stockpile Area 1. In the USACE verification, it was determined that Wetland E was non-jurisdictional because it lacks a connection to jurisdictional waters (is an isolated wetland) (OG 2009a, Appendix 5.2F). Wetland E, however, is under perpetual conservation easement granted to CDFG (CH2MHILL 2010k, Attachment C). Stormwater drainage from the OGS site would be designed by the project owner, in consultation with the CDFG, to avoid any changes in flow that could adversely affect Wetland E. This area provides suitable habitat for several bird species, including various waterfowl. Wetland E has been documented to support

nesting redwinged blackbirds (Davis pers. comm.). Two additional wetlands (Wetland D and Wetland F) were also determined to be non-jurisdictional. Wetland F is a 0.37-acre wetland located 84 feet south of Stockpile 2. Wetland D is a 0.38-acre wetland located 46 feet north of Stockpile 3 (CH2MHILL 2010c). Project construction would not cause loss or fill of any wetlands. The City of Oakley has recommended conditions of approval for the OGS project which include protecting, preserving, and improving the 0.62-acre wetlands located on the OGS project site by removing garbage and replacing non-native species with native species at an approximate value of $200,000 (COO 2010a and COO 2010c).

No other wetlands or waters of the Unites States (U.S) were identified within the project area. However, potential wetlands and other waters of the U.S. occur adjacent to the project area. Two additional wetlands were identified as part of the wetland delineation study. The San Joaquin River, a traditional navigable water, is located north of the OGS site. The shoreline along the San Joaquin River is 0.6 mile north of the project site and supports palustrine emergent wetlands that provide habitat for Sacramento perch, California black rail, California least tern, tricolored blackbird, and other sensitive species. The transmission line right-of-way intersects with East Antioch Creek approximately 120 feet from an existing steel-lattice tower that would be replaced with a tubular steel pole. Access to this area is via an existing paved and earthen walking trail that crosses the aquatic feature via a culvert.

Protected Trees

The City of Oakley defines protected trees as any of the indigenous tree included in Article 9.1.1114(c)(2)(a)(i) of the City of Oakley Zoning Ordinance. and adjacent to or part of a riparian, foothill woodland, or oak savanna area, or part of a stand of four or more trees, measuring 6.5 inches in diameter at breast height (dbh) or greater as measured 4.5 feet from ground level, or multi-stemmed tree with the sum of the circumferences measuring 40 inches or larger, measured 4.5 feet from ground level. The City of Antioch Zoning Ordinance Title 9, Chapter 5, Article 12 defines protected trees as any established tree having a circumference of 10 inches or greater dbh or any mature tree having a circumference of at least 26 inches dbh. Removal of protected trees requires city permits for Oakley and Antioch. Protected trees in the project vicinity within the City of Oakley include six interior live oak (*Quercus wislizenii*) located in the vineyard where the proposed Air Cooled Condenser would be located. One of the two interior live oak located near towers to be replaced along the transmission line route are considered protected as defined by the City of Antioch. The second interior live oak is less than 10 inches dbh and is in poor condition. Heritage trees are defined by the City of Oakley as a tree 50 inches or more in circumference measured 4.5 feet above the natural grade or a tree determined to have a special significance to the community because of a unique quality, species, size, or historic or ecological value. Landmark trees are defined by the City of Antioch as any tree at least 48 inches dbh or in excess of 40 feet in height. No heritage or landmark trees are located within the OGS project site or along any linear features. The applicant plans to submit an arborist report for Antioch and Oakley prior to the publication of the FSA.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The threshold for determining significance is based on the biological resources present or potentially present within the proposed project area in consideration of the proposed project description. A proposed project would have a significant impact to biological resources, if it would:

- Have an adverse impact, either directly through take, or indirectly through habitat modification or interruption of migration corridors, on any state- or federally-listed species;
- Have an indirect or direct adverse effect on any sensitive natural community identified in federal, state or local plans, policies, or regulations;
- Interfere with the movement of any native wildlife species (resident or migratory) or with established native wildlife (resident or migratory) corridors; or
- Conflict with applicable federal, state, or local laws, ordinances, regulations, and standards protecting biological resources, as listed in **Biological Resources Table 1**.

DIRECT AND INDIRECT IMPACTS AND MITIGATION

The California Environmental Quality Act (CEQA) Guidelines define “direct” impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance and are still reasonably foreseeable and related to the operation of the project. Significance of impacts is generally determined by compliance with applicable LORS; however, guidelines adopted by resource agencies may also be used.

This section analyzes the potential for direct and indirect impacts of construction and operation of the proposed project to biological resources and provides mitigation, as necessary, to reduce the severity of potentially adverse impacts. The applicant needs to provide revised calculations of impact fees to be paid to the East Contra Costa County Habitat Conservancy (Conservancy) to be included in the Final Planning Survey Report (PSR) and the arborist report, including updated tree survey results, which would be used to determine fees to be paid to the City of Oakley and City of Antioch for removal of protected trees. Modifications to the staff’s impact analysis and temporary and permanent impact fees and acreages, as well as additional conditions of certification and modifications to currently proposed conditions of certification are likely based on further consultation with state and federal agency personnel and additional information expected from the applicant and the Conservancy after publication of this Preliminary Staff Assessment (PSA).

General Impact Avoidance, Minimization, and Mitigation Measures

Staff recommends that a Designated Biologist and Biological Monitor(s) be employed to ensure impact avoidance and minimization measures described below and protection of any sensitive biological resources potentially occurring in the project area. Selection criteria and minimum qualifications of the Designated Biologist and Biological Monitor(s)

(such as an appropriate degree and/or field experience) are described in staff's proposed Conditions of Certification **BIO-1** (Designated Biologist Selection) and **BIO-3** (Biological Monitor Qualifications). The Designated Biologist and Biological Monitor, their duties (such as required presence on-site and involvement in preparing plans and reports), and authority (including the authority to halt project activities under certain circumstances) are described in staff's proposed Conditions of Certification **BIO-2** (Designated Biologist Duties) and **BIO-4** (Designated Biologist and Biological Monitor Authority), respectively. The Designated Biologist and/or Biological Monitor would be responsible, in part, for developing and implementing the Worker Environmental Awareness Program (WEAP) (see Condition of Certification **BIO-5**), which is a mechanism for training the workers on why it is important to protect the sensitive biological resources described in this analysis.

Staff's proposed Condition of Certification **BIO-6** provides for the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), which consolidates all project resource mitigation, monitoring, and compliance measures, as well as other information necessary to ensure compliance with, and effectiveness of, all project-specific required impact avoidance, minimization, and mitigation measures.

Staff's proposed Condition of Certification **BIO-7** (General Impact Avoidance and Minimization Measures), describes general measures to be in place throughout project construction to avoid and minimize impacts to biological resources from the proposed project during site mobilization, ground disturbance, grading, construction, operation, maintenance, and closure.

The applicant has proposed several mitigation measures that relate to the Designated Biologist duties, and the WEAP, and general impact avoidance, minimization, and mitigation (OG 2009a). This includes measures proposing biological monitors and requirements for their presence on site during sensitive work; protecting wetlands and other waterways from sediment and other pollutants; dust control; development and implementation of site restoration plan; protections for special-status species; and an on-site construction personnel environmental awareness program. Staff agrees with many of these proposals, and, where appropriate, has incorporated these items into staff's proposed conditions of certification.

Construction-Related Impacts and Mitigation

Construction Impacts to General Vegetation

Construction impacts to vegetation could occur through the direct removal of plants during construction or crushing by heavy equipment. As these impacts are generally localized and are primarily temporary, they are not usually considered significant unless the habitat type is regionally unique or is known to support special-status species. The proposed project would result in the permanent disturbance of approximately 17.1 acres. Temporary impacts fees to be paid to the Conservancy are assessed to areas subject to temporary disturbance where recovery would take place within approximately two to four years. The proposed project would result in the temporary disturbance of approximately 0.3 acre. The OGS project site, sanitary sewer force main, and existing transmission towers are located in a variety of land uses, including active industrial and

commercial properties (categorized as urban), vacant lots composed of ruderal grassland (categorized as ruderal), active vineyard agricultural (categorized as vineyard), landscaped residential (categorized as ruderal), and inactive non-native ruderal grassland habitat (categorized as ruderal). The row of trees along the northern border of the OGS site is categorized as non-native woodland and the vegetation along East Antioch Creek is categorized as riparian (See **Biological Resources Table 3).** Areas protected by wildlife exclusion fencing or silt fencing or areas categorized as urban are considered exempt from mitigation fees; this include 0.5 acre of non-native woodland and 1.6 acres at the Wetland E Conservation Easement that would be protected by wildlife exclusion fencing and 2.8 acres of urban habitat cover (CH2MHILL 2010s). Construction of the proposed project would not result in substantial loss of native vegetation or a regionally unique habitat type; any temporary or permanent impacts to general vegetation would be mitigated to a less-than significant level through a one-time payment to the Conservancy) (CH2MHILL 2010s) as required in Condition of Certification **BIO-20** (East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan Mitigation Fees). The one-time payment to the Conservancy would mitigate for loss of vegetation as the fees go toward purchasing land/habitat for all species covered under the ECCC HCP/NCCP permit, as part of the core conservation strategy of the ECCC HCP/NCCP. The one-time payment to the Conservancy is the primary mitigation fee for the development of areas which are removed from an undeveloped or habitat-providing state (CH2MHILL 2010k).

BIOLOGICAL RESOURCES Table 3
Temporary and Permanent Impacts to General Vegetation

Habitat Cover	Total Acres Impacted	Area Inside Wildlife Exclusion Fencing	Fee Zone[1]	Mitigation Acreage Required*
Non-native woodland				
Permanent	0.6	0.5	I	0.1
Temporary (construction laydown area)	0.61	0.57	I	0.04
Ruderal				
Permanent	3.0	0	I	3.0
Temporary (construction laydown area)	13.1	0.1	I	13.0
Temporary (soil stockpile area)	5.0	0	I	5.0
Temporary (transmission line corridor)	2.9/9.2	0	I/IV	2.9/9.2
Temporary (transmission line pull sites)	0.5/2.0	0	I/IV	0.5/2.0
Urban				
Permanent	2.8	0	I	0
Temporary (construction laydown area)	6.5	0	I	0
Temporary (soil stockpile area)	2.2	0	I	0
Temporary (transmission line corridor)	2.8/1.4	0	I/IV	0
Temporary (transmission line pull site)	0.7	0	I	0
Temporary (sanitary sewer force main)	1.6	0	I	0
Vineyard				
Permanent	13.9	0	I	13.9
Temporary (transmission line corridor)	2.3/2.7	0	I/IV	2.3/2.7
Temporary (transmission line pull site)	0.2	0	I	0.2
Riparian				
Permanent	0	0	I	0
Temporary (transmission line corridor)	0/0.2	0/0.2	I/IV	0
Total				
Permanent	20.3	0.5	I	17.0
Temporary	53.91	0.87	I/IV	37.84

Source: CH2MHILL 2010s

[1] The entire project site would be located within Development Fee Zone I. Approximately 5.2 acres of the transmission line corridor are located in Development Fee Zone I. The remaining 11.9 acres will be located within Development Fee Zone IV.

* Details of impact analysis and mitigation requirements are still in progress. Energy Commission staff is working with Conservancy and the applicant to finalize these acreages.

Construction Impacts to Trees

Construction impacts to trees could occur through the direct removal of trees during construction. Construction of the proposed project would not result in substantial loss of native trees; any impacts to trees would be fully mitigated through a payment to the City

of Antioch and/or the City of Oakley based upon the result of the arborist report. The City of Oakley was contacted by the applicant on March 3, 2010, to inquire what the in-lieu fee payment schedule would be for the OGS project. The City of Oakley confirmed that there is no established fee schedule and that the in-lieu fee payment schedule is determined on a project by project basis by a certified arborist for each tree impacted. Therefore, a fee estimate was unavailable from the City at this time. This fee is estimated to be in the range of $4,000 to $5,000 per tree removed (CH2MHILL 2010j). The City of Antioch requires that legally removed protected trees be replaced by boxed specimens at a rate of two 24-inch box trees for each established tree and two 48-inch box trees for each mature tree. The applicant is currently developing an arborist report that addresses trees within the Oakley and Antioch city limits for the OGS project that would be based on follow-up tree surveys to be completed prior to the publication of the FSA. Mitigation fees to be paid to the cities of Oakley and Antioch for removal of protected trees are incorporated into staff's proposed Condition of Certification **BIO-8** (Protected Tree Mitigation Fees).

Construction Impacts to General Wildlife

Direct loss of small mammals, reptiles, and other less mobile species could occur during construction of the proposed project. This would result primarily from the use of construction vehicles and equipment at the OGS site. Small burrowing animals (lizards, snakes, and small mammals) could be harmed through crushing of burrows, loss of refugia from predators, and direct mortality from construction activities. Construction activities and human presence could also alter or disrupt breeding and foraging habitats and activities for common wildlife species.

The OGS site provides suitable nesting habitat for a variety of common bird species. Birds could nest in the eucalyptus trees along the northern border of the OGS site, the wetland habitats north of the proposed site, in trees located north of the OGS site near the soil stockpiles, and in trees along the sanitary sewer force main route. Trees and shrubs along the proposed transmission line route also provide suitable nesting habitat for a variety of common birds. Additionally, some bird species adapted to disturbed environments could nest in equipment or other available substrate within and surrounding the proposed project area. Construction activities during the nesting season (February through September) could adversely affect breeding birds through direct take or indirectly through disruption or harassment. The applicant proposes to conduct breeding bird surveys prior to each phase of construction and monitor the nest, should one be discovered (OG 2009a, p. 5.2-56). Staff incorporated this applicant-proposed measure into Condition of Certification **BIO-9** (Pre-Construction Nest Surveys and Impact Avoidance and Minimization Measures for Breeding Birds), which provides additional detail on survey timing and recommendations to avoid disturbance to active nests and ensure compliance with the Migratory Bird Treaty Act. With implementation of Condition of Certification **BIO-9**, significant impacts to nesting birds would not result from proposed project construction activities.

Several isolated wetlands located near the proposed soil stockpiles provide suitable foraging habitat for several bird species, including various waterfowl. Construction activities near the isolated wetlands (Wetland E, Wetland D, and Wetland F), including development of a detention pond and bioswales and creation of soil stockpiles may

result in indirect impacts (i.e., contamination) to the habitat and wildlife species potentially occurring in these areas. In addition, dewatering operations proposed for installation of new transmission line towers near East Antioch Creek may result in indirect impacts to the habitat and wildlife species potentially occurring in these areas. The applicant proposed several impact avoidance and minimization measures, which staff has determined are adequate to reduce potential impacts to biological resources at the isolated wetlands and East Antioch Creek to less than significant. These measures include clearly delineating environmentally sensitive areas, using a biological monitor, prohibiting construction discharges into surface waters, installing erosion control measures, complying with best management practices, and controlling introduction of weeds. These measures from Responses to Energy Commission Data Requests Set 2 – Data Response #62-1 (CH2MHILL 2010c) and the ECCC HCP/NCCP Planning Report (CH2MHILL 2010s) are incorporated by reference into staff's proposed Condition of Certification **BIO-6** (Biological Resources Mitigation Implementation and Monitoring Plan).

Terrestrial wildlife could become entrapped in open trenches during construction, especially if trenches remain open during inactive construction periods. Staff recommends Condition of Certification **BIO-7** (General Impact Avoidance and Minimization Measures), which would require exclusion measures for open trenches (e.g., fencing or covering), inspection of trenches prior to resuming construction activities each day, and installation of escape ramps so that animals that fall in the trench could escape. Implementation of this measure would minimize adverse impacts to wildlife from entrapment.

Construction Impacts to Special-Status Plant Species

Project construction would occur entirely within previously disturbed areas or in ruderal uplands that are unlikely to support special-status plants. No special-status plants were found during focused surveys at the project site in 2009 and 2010. A follow-up survey for special-status plants was conducted in the fall of 2010 and the results are expected to be included in the Final Planning Survey Report (PSR) to be submitted by the applicant prior to publication of the Final Staff Assessment. There is an extremely low probability that special-status plant species occur within the impact areas. No sensitive plants were found during earlier surveys and as such there is no proposed condition of certification related to sensitive plants.

Construction Impacts to Special-status Wildlife

Direct impacts from proposed project construction would include individual mortality from vehicles and equipment and displacement (avoidance of an area and modified behavior due to construction activities). Potentially affected special-status wildlife species include Swainson's hawk and white-tailed kite which were observed or detected in the project area, as well as the other potentially occurring species listed in **Biological Resources Table 2**.

The proposed OGS site and transmission line corridor and its immediate vicinity provides potential habitat for silvery legless lizard, burrowing owl, golden eagle, Swainson's hawk, northern harrier, white-tailed kite, loggerhead shrike, American badger, and San Joaquin kit fox. The portion of East Antioch Creek that would be

crossed by the transmission line route provides limited potential habitat for western pond turtle, giant garter snake, and California red-legged frog (CH2MHILL 2010s). The Wetland E conservation easement area provides habitat for song sparrow “Modesto” population. Trees in the proposed project area also provide roosting and foraging habitat for special-status bat, including western red bat and pallid bat.

Portions of the project site including the transmission line corridor could support denning and burrowing animals such as western burrowing owls, American badger, and San Joaquin kit foxes. These species use or enlarge burrows, or dens, created by California ground squirrels, and both could potentially be within or directly adjacent to the transmission corridor. Dens within the project site would likely be destroyed or be otherwise indirectly impacted by construction noise and dust. Animals occupying those dens, both within and adjacent to impacted areas could be disturbed or harmed during construction and may be subjected to ongoing impacts related to maintenance after construction is completed. Protection provided by kit fox dens for use as shelter, escape, cover, and reproduction is vital to the survival of the species.

Staff’s proposed Condition of Certification **BIO-9** (Pre-Construction Nest Surveys and Impact Avoidance and Minimization Measures for Breeding Birds) outlines impact minimization and avoidance measures to avoid construction impacts to nesting special-status birds**.** Staff’s proposed Condition of Certification **BIO-10** (Impact Avoidance and Minimization Measures for Bats) outlines impact minimization and avoidance measures to avoid construction impacts to roosting special-status bats during tree removal. Staff’s proposed Condition of Certification **BIO-11** (Swainson’s Hawk Nest Tree Mitigation and Monitoring) outlines impact minimization and avoidance measures to avoid construction impacts to nesting Swainson’s hawk. Staff’s proposed Condition of Certification **BIO-12** (Burrowing Owl Impact Avoidance and Minimization Measures), **BIO-13** (American Badger Impact Avoidance and Minimization Measures), and **BIO-14** (Avoid Harassment or Harm to San Joaquin Kit Fox), outline impact minimization and avoidance measures to avoid construction impacts to burrowing wildlife. Staff’s proposed Condition of Certification **BIO-7** (General Impact Avoidance and Minimization Measures), **BIO-15** (Western Pond Turtle Impact Avoidance and Minimization Measures), **BIO-16** (Giant Garter Snake Impact Avoidance and Minimization Measures), and **BIO-17** (California Red-legged Frog Impact Avoidance and Minimization Measures) outline impact minimization and avoidance measures to avoid construction impacts to aquatic wildlife potentially occurring in East Antioch Creek and Wetland E. The applicant proposed several impact avoidance and minimization measures, which staff has determined are adequate to reduce potential impacts to wildlife to less than significant. These measures include conducting pre-construction surveys and delineating species-specific avoidance buffers. Applicant-proposed impact avoidance and minimization measures along with staff’s proposed conditions of certification would avoid impacts to wildlife or mitigate them to less than significant levels. Participation in the ECCC HCP/NCCP would provide take authorization of covered species which include the following species potentially occurring in the project area: California red-legged frog, western pond turtle, silvery legless lizard, giant garter snake, western burrowing owl, San Joaquin kit fox, Swainson’s hawk, golden eagle. However, direct take of white-tailed kite and golden eagle is not permitted under the ECCC HCP/NCCP. Proof of take authorization would be required under **BIO-22** (East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan Certificate of Inclusion).

Temporary or permanent impacts to foraging habitat for special-status species, including Swainson's hawk and golden eagle, would be mitigated to a less-than significant level through a one-time payment to the East Contra Costa County Habitat Conservancy (Conservancy) (CH2MHILL 2010s) as required in Condition of Certification **BIO-20** (East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan Mitigation Fees). The one-time payment to the Conservancy would also mitigate for loss of silvery legless lizard habitat within the OGS project site as the fees go toward purchasing land/habitat for all species covered under the ECCC HCP/NCCP permit, as part of the core conservation strategy of the ECCC HCP/NCCP. No additional species-level measures are proposed for silvery legless lizard under the ECCC HCP/NCCP beyond mitigation fees for impacts. The one-time payment to the Conservancy is the primary mitigation fee for the development of areas which are removed from an undeveloped or habitat-providing state (CH2MHILL 2010k).

General Construction Impacts

Construction activities, including noise and lighting impacts, have the potential to create a variety of temporary impacts to biological resources.

Noise

According to the AFC application, construction activities would typically occur between 6:00 a.m. and 7:00 p.m. and would result in a short-term, temporary increase in the ambient noise level. However, construction work would be allowed only during the daytime hours of 7:30 a.m. to 7:00 p.m. on weekdays and 9:00 a.m. to 7:00 p.m. on weekends (Condition of Certification **NOISE-8**). The OGS project site is located in an area that historically was occupied by industrial uses related to the DuPont plant operations which ceased operations in 1998. Traffic on Bridgehead Road and State Route 160 and activities at the Lauritzen Yacht Harbor and the Burlington Northern Santa Fe Railroad as well as the Contra Costa Power Plant (CCPP) and Gateway Generating Station in the immediate vicinity of the proposed OGS site create elevated ambient noise levels to which most local wildlife species have acclimated. However, excessive construction noise has the potential to disrupt the nesting, roosting, or foraging activities of sensitive wildlife, especially wildlife located at Wetland E, which is within the OGS project boundaries and approximately 400 feet west of the main OGS facility site. The San Joaquin River is another sensitive area that supports a diversity of waterfowl and is located approximately 0.6 miles north of a main OGS facility site.

Steam blowing will likely be the loudest construction activity and is anticipated to occur approximately 750 feet from Wetland E and 0.6 mile from the river shoreline. Low-pressure steam blow sound levels could reach approximately 63 A-Weighted Sound Pressure Level (dBA) at the Wetland E and 54 dBA at the shoreline (OG 2009a). High-pressure steam blow sound levels could reach approximately 76 dBA at the Wetland E and 68 dBA at the shoreline (OG 2009a). Other loud construction activity includes pile driving which could reach sound levels of approximately 81 dBA at the Wetland E and 72 dBA at the shoreline (OG 2009a). A maximum construction noise level of 89 dBA Leq is estimated to occur at a distance of 50 feet from the acoustic center of the construction activity (most often the power block) and attenuate to no more than 57 dBA Leq at the Lauritzen Yacht Club Harbor. It was estimated by the applicant that ambient daytime sound levels at the Yacht Club Harbor are approximately 54 dBA, this is a

conservative estimate based on the lowest ambient sound level measured for the project area. Studies have shown that noise levels over 60 A-weighted decibels (dBA) can affect the behavior of certain bird species (Dooling and Popper 2007). In addition, 60 dBA has been used by the USFWS and the Energy Commission as a reference point for evaluating noise impacts on wildlife (CEC 2002; CEC 2003). Construction noise levels are predicted to be 55 dBA at the edge of the proposed project site (OG 2009a).

To minimize noise impacts to breeding birds potentially nesting in the row of eucalyptus trees and at the Wetland E conservation easement area as well as bats potentially roosting in trees on the OGS project site, staff recommends conditions of certification **BIO-9** and **BIO-10**, which requires a qualified biologist to monitor any bird nest or bat maternity roost locations exposed to excessive construction noise until the biologist determines that nestlings have fledged and dispersed or bats are volant (capable of flight). Activities that might disturb nesting or roosting activities (e.g., excessive noise above 60 dBA, especially during steam blowing), shall be prohibited within the buffer zone until such a determination is made. With implementation of this condition, impacts to nesting birds and roosting bats from proposed project construction activities would be less than significant. For a complete analysis of construction noise impacts, refer to the **Noise and Vibration** section of this Preliminary Staff Assessment.

Lighting

According to the AFC application, project construction activities are planned to occur between 6:00 a.m. and 7:00 p.m.; however, pursuant to Condition of Certification **NOISE-8,** construction work would be allowed only during the daytime hours of 7:30 a.m. to 7:00 p.m. on weekdays and 9:00 a.m. to 7:00 p.m. on weekends. Any deviation from those construction hours would be subject to approval of the Compliance Project Manager. Bright lighting at night could disturb the resting, foraging, or mating activities of wildlife and make wildlife more visible to predators. Also, night lighting could be disorienting to migratory birds and, if placed on tall structures, may increase the likelihood of collision, as discussed below. Existing operations at the adjacent PG&E Antioch Terminal and nearby industrial areas as well as traffic on Bridgehead Road and SR 160 provide an elevated ambient level of lighting to which some local wildlife species have acclimated.

The following applicant-proposed impact avoidance and minimization measures pertain to project lighting (OG 2009a; pp. 5.13-33):

- Lighting on the project site would be limited to areas required for safety and operation, would be hooded and directed onsite to minimize significant light or glare, and would be shielded from public view to the extent practical;
- All lighting that is not required to be on during nighttime hours would be controlled with sensors, switches, or timers operated so that the lighting would only be on when needed; and
- Low-pressure sodium vapor fixtures of a non-glare type would be used. These lights are the efficient electrically-powered light source and typically produce low-intensity yellow/amber light, which would reduce visual contrast with the night sky.

The existing commercial and industrial environment provides several light sources. Implementation of these applicant-proposed measures would ensure that temporary and permanent construction lighting would not create substantial sources of new light. These measures are incorporated by reference into staff's proposed Condition of Certification **BIO-7 and VIS-3** (see the **Visual Resources** section of Preliminary Staff Assessment – Part A). In addition, staff recommends that lighting be specifically directed away from biologically sensitive areas (i.e., Wetland E) (refer to Condition of Certification **BIO-7**). With implementation of these conditions, impacts to sensitive wildlife from increased night lighting during construction would not occur.

Operation Impacts and Mitigation

Potential operation-related impacts include impacts to birds due to collision with and/or electrocution by the transmission lines, disturbance to wildlife due to increased noise and lighting, storm water runoff, and indirect impacts to sensitive species and their habitat from air emissions.

Avian Collision and Electrocution

Proposed project components that may present an electrocution and/or collision hazard to wildlife include exhaust stacks and transmission line support structures. The OGS project would construct two generation units, each with an associated 155-foot-tall, 20-foot-diameter exhaust stack. The generated power would be transmitted approximately 2.4 miles to PG&E's Contra Costa Substation via an existing transmission corridor. The 230-kV electrical interconnection would extend approximately 2.4 miles and include replacement of 17 existing steel lattice towers with new 95-foot-tall tubular steel pole structures. One additional 95-foot tall tubular steel pole would be added along the transmission line route and one steel lattice tower located within Wetland E would remain in place. The existing CCPP and Gateway Generating Station located approximately 0.8 miles northwest, have several tall generation and transmission structures, including two 195-foot-tall Gateway Generating Station exhaust stacks. The tallest existing exhaust stack at the nearby CCPP is approximately 400 feet tall.

Collision

Birds are known to collide with transmission lines, exhaust stacks, and other structures, causing mortality to the birds. Bird collisions with power lines and structures generally occur when a power line or other structure transects a daily flight path used by a concentration of birds and these birds are traveling at reduced altitudes and encounter tall structures in their path (Brown 1993). Collision rates generally increase in low light conditions, during inclement weather, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing danger. Collisions are more probable near wetlands, within valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths (APLIC 1994); aside from the wetland, these features are not present near the proposed project area. The Wetland E conservation easement located in the project area is east of the existing transmission line, and north of an existing gas metering yard.

The two proposed exhaust stacks would be approximately 155 feet tall, and would be within an open area adjacent to existing transmission lines. The proposed 230-kV transmission line monopoles would be 95 feet tall (OG 2009a). Structures over 500 feet

tall present a greater risk to migratory songbirds than shorter structures (Kerlinger 2000); bird mortality is significantly lower at towers shorter than 350 feet (Longcore et al 2008). Because the project exhaust stacks and transmission lines would be significantly shorter than 350 feet tall, these proposed project features would pose a relatively low height-related collision risk to migrating birds. The applicant proposes to incorporate design measures, such as the installation of approved bird flight diverters which would greatly reduce the chance of collision. Bird flight diverters are usually installed on the ground wire to lessen the collision threat. With installation of approved bird flight diverters, staff concludes that the project structures would not pose a significant collision threat to resident or migratory bird populations. Staff agrees with this applicant-proposed impact avoidance and minimization measure and has incorporated it into staff's proposed Condition of Certification **BIO-7**.

Electrocution

Egrets, herons, raptors, and other large aerial perching birds, including those offered state and/or federal protection, are susceptible to transmission line electrocution if they simultaneously contact two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower/pole with insufficient clearance between these energized elements. The majority of bird electrocutions are caused by lines that are energized at voltage levels between 1-kV and 60-kV, and "the likelihood of electrocutions occurring at voltages greater than 60-kV is low" because phase-to-phase and phase-to-ground clearances for lines greater than 60-kV are typically sufficient to prevent bird electrocution (APLIC 2006). The proposed OGS transmission lines would be 230-kV; therefore, phase-to-phase and phase-to-ground clearances are expected to be sufficient to minimize bird electrocutions.

To avoid potential electrocution impacts, the applicant proposes to construct the transmission lines in accordance with Avian Powerline Interaction Committee guidelines specifically designed to reduce the risk of bird electrocution (OG 2009a; p. 5.2-21). Staff agrees with this applicant-proposed impact avoidance and minimization measure and has incorporated it into staff's proposed Condition of Certification **BIO-7**. Specifically, the phase conductors shall be separated by a minimum of 60 inches and bird perch diverters and/or specifically designed avian protection materials should be used to cover electrical equipment where adequate separation is not feasible (APLIC 2006). With implementation of this condition, electrocution impacts to birds would not occur.

Operation Lighting

Several existing light sources are located in the vicinity of the proposed OGS site, including the commercial and industrial operations as well as traffic on State Route 160 and Bridgehead Road. A slight increase in light is expected to occur during operation of the OGS. Under certain circumstances, lights can disorient migratory birds or bats flying at night or attract wildlife such as insects and insect-eaters. Implementation of applicant-proposed measures would ensure that operational lighting would not create substantial sources of new light. These measures have been incorporated into staff's proposed Conditions of Certification **VIS-3** and **BIO-7** (see the **Visual Resources** section of Preliminary Staff Assessment – Part A). Implementation of these conditions would ensure significant impacts from operation lighting would be avoided.

Operation Noise

The OGS site is zoned as Heavy Industrial and has a General Plan Land Use Designation of Utility Energy. It is located within 0.5 mile of other energy facilities including the CCPP and the Gateway Generating Station. In addition, the project site is immediately east of Bridgehead Road, approximately 0.1 mile east of State Route 160 and 50 feet north of the Burlington Northern Santa Fe Railroad. Therefore, it is likely that animals in this area have become habituated to an elevated level of ambient noise. Operation of the plant would produce slightly elevated noise levels, but no sensitive species that could be impacted by this nominal increase in noise are known to occur in the immediate vicinity. Staff concludes there would be no significant impacts to biological resources by increased operational noise; no mitigation beyond Staff's Condition of Certification **NOISE-4** (in the **Noise and Vibration** section of Preliminary Staff Assessment – Part A) is proposed.

Stormwater Runoff

Stormwater runoff at the OGS site currently drains to Wetland E and supports the existing hydrology of the wetland area. Stormwater runoff from open areas on the OGS project site would be conveyed to the proposed bioswales and detention basin which would then be discharged to Wetland E in accordance with the Contra Costa County Clean Water Program's Clean Water Program's Stormwater C.3 Guidebook. Runoff from the power block area would be routed through an oil/water separator before being discharged to the sanitary sewer system. Stormwater runoff would be conveyed in accordance with the National Pollutant Discharge Elimination System (NPDES) General Industrial Permit requirements. Impacts to Wetland E would not occur. For a complete analysis of water quality impacts, refer to the **Soil and Water Resources** section of this Preliminary Staff Assessment.

The project would not affect any creeks, drainages, wetlands, or other aquatic resources. Appropriate soil erosion and sediment controls will be implemented on-site to prevent construction materials and/or eroded soils from entering aquatic resources (Wetland E, Wetland D, and Wetland F). Proposed Conditions of Certification **SOIL & WATER-1**, in which the applicant is required to obtain Compliance Project Manager approval for a site-specific drainage, erosion, and sediment control plan, that outlines drainage, soil erosion and sediment control measures would be required, and **SOIL & WATER-2**, in which the applicant is required to develop and implement a construction Storm Water Pollution Prevention Plan. In addition, the applicant has developed measures, in coordination with California Department of Fish and Game staff, to ensure that the OGS project stormwater management system does not negatively effect the quality of stormwater draining into Wetland E and adversely alter the flow of stormwater into the wetland (CH2MHILL 2010j, CH2MHILL 2010k)~~.~~. Proposed Condition of Certification **SOIL & WATER-6** requires the applicant to implement a stormwater management plan approved by the Compliance Project Manager in accordance with the requirements of Contra Costa County, the City of Oakley, and Department of Fish and Game. For more details, see the **Soil and Water Resources** section of this Preliminary Staff Assessment. The applicant also proposed measures that would potentially enhance the function and values of the wetland and upland habitats of the Wetland E Mitigation Area (Condition of Certification **BIO-18**). In addition, it is expected that for coverage under the ECCC HCP/NCCP, the applicant would install wildlife exclusion

fencing to protect the riparian habitat along East Antioch Creek in the vicinity of the intersection with the transmission line right-of way (Condition of Certification **BIO-7**).

Wetland E Mitigation Area

The applicant, in coordination with California Department of Fish and Game (CDFG), has proposed enhancement measures that have the potential to improve the existing wetland and upland habitats located within the 1.60-acre conservation easement identified as the Wetland E Mitigation Area. The applicant developed a Wetland E Management Plan (CH2MHILL 2010k) which details plans to enhance the function and values of the Wetland E Mitigation Area. CDFG approved the approach and goals of the plan on June 21, 2010 (CH2MHILL 2010l). The wetland collects stormwater runoff from the 25-acre area located east and south of the easement (CH2MHILL 2010k). The OGS facilities would occupy the majority of these 25-acres after project completion. The applicant proposes to maintain the existing water quality and hydraulic flow to the Wetland E easement area through a stormwater management system. The applicant has developed measures, in coordination with CDFG staff, to ensure that the OGS project stormwater management system does not negatively affect the quality of stormwater draining into Wetland E and adversely alter the flow of stormwater into the wetland (CH2MHILL 2010j, CH2MHILL 2010k). Proposed Condition of Certification **SOIL & WATER -6** requires the applicant to implement a Wetland E Monitoring and Adaptive Management Plan approved by the Compliance Project Manager in accordance with the requirements of CDFG and the Central Valley Regional Water Quality Control Board (For more details, see the **Soil and Water Resources** section of this Preliminary Staff Assessment).

The applicant, in coordination with CDFG, developed proposed habitat improvements as part of the Wetland E Management Plan that would be implemented as part of the conditions of certification for the OGS project (CH2MHILL 2010k). Goals and objectives include measures to re-establish native vegetation within the conservation easement by planting upland dune vegetation within approximately 0.3 acre of the Wetland E Mitigation Area, implementing noxious weed control methods, replacing non-native trees with coast live oak (*Quercus agrifolia*), blocking the overflow drain into the preserve, and including native plants in the landscape screening plan. The landscape screening plan is fully described in **VIS-2** (For more details, see the **Visual Resources** section of Preliminary Staff Assessment – Part A). Goals and objectives also include maintaining wildlife habitat value and wildlife use within the conservation easement. This would be measured by no significant change in duration or extent of wetland ponding compared to pre-project conditions and no significant change in species composition or cover of wetland vegetation compared to pre-project conditions (CH2MHILL 2010k).

Currently, the upland area adjacent to the wetland is dominated by non-native grasses and herbaceous plants including the following California Invasive Plant Council (Cal-IPC) Inventory rated noxious weed species: pampasgrass (*Cortaderia selloana*, rated High), yellow star thistle (*Centaurea solstitialis,* rated High), and Russian thistle (*Salsola tragus*, rated Limited). This area would be revegetated with nursery-grown plugs of native perennial herbs and shrub and hand broadcast native annual seed mixtures including native species similar to those found in the Antioch Dunes National Wildlife

Refuge. The herbaceous species would include native upland dune species such as silver bush lupine (*Lupinus albifrons*), naked buckwheat (*Eriogonum nudum var.auriculatum*), deerweed (*Lotus scoparius*), California poppy (*Eschscholzia californica*), bush senecio (*Senecio douglasii*), California matchweed (*Gutierrezia californica*), telegraphweed (*Heterotheca grandiflora*), elegant clarkia (*Clarkia unguiculata*), and California croton (*Croton californicus*).

As part of the Wetland E Post-construction Management Plan the project owner would submit detailed baseline maps which show the current species composition or cover of wetland vegetation as well as current extent of noxious weed cover as determined by standard vegetation sampling methods. Sampling methods would be fully described in the Wetland E Post-construction Management Plan (see Condition of Certification **BIO-18**). The maps would be updated and submitted as part of the required annual monitoring reports in order to determine if the habitat enhancement objectives are met during each monitoring year. Removal of non-native trees and noxious weed control methods as well as performance criteria would be detailed in the Wetland E Post-Construction Management Plan. The plan would include monitoring methods, planting design, responsible parties, long-term management and maintenance requirements, contingency plan, and details on the funding source (CH2MHILL 2010k).

Monitoring methods and long-term management and maintenance activities would be fully described in a Wetland E Post-construction Management Plan to be developed upon project approval by the applicant in coordination with staff and CDFG as part of Condition of Certification **BIO-18** (Wetland E Post-construction Management Plan). Implementation of staff's proposed conditions of certification including **SOIL & WATER - 6, VIS-2**, **BIO-7**, which includes measures to avoid off-site impacts from construction equipment and lighting, and **BIO-18** would ensure that significant impacts to the conservation easement area would be avoided.

Air Emissions – Nitrogen Deposition

Nitrogen deposition is the input of nitrogen oxide (NO_x) and ammonia (NH_3) derived pollutants, primarily nitric acid (HNO_3), from the atmosphere to the biosphere. Mechanisms by which nitrogen deposition can lead to impacts on sensitive species include direct toxicity, changes in species composition among native plants, and enhancement of invasive species (Fenn et al 2003; Weiss 2006a). The increased dominance and growth of invasive annual grasses is especially prevalent in low-biomass vegetation communities that are naturally nitrogen-limited, such as coastal sage scrub, serpentine grassland, desert scrub, and sand dunes (Weiss 2006a).

The Antioch Dunes National Wildlife Refuge (NWR), which is approximately 1.6 miles west of the proposed OGS site, was once part of an expansive aeolian (wind-blown) dune system along the shoreline of the San Joaquin River. Established in 1980, the Antioch Dunes NWR comprises 67 acres in two disjunct units (Sardis Unit and Stamms Unit) and supports the last known natural populations of the federally endangered Lange's metalmark butterfly, federally and state endangered Antioch Dunes evening primrose, and federally and state endangered Contra Costa wallflower (USFWS 2001c).

Annual survey data collected from 1984 to 2009 shows that the populations of these endangered species are generally in decline and largely sustained by artificial propagation and transplantation (USFWS 2009a; USFWS 2009b; USFWS 2010a; Euing pers. com.). The Lange's metalmark butterfly is in danger of extinction in the wild. The peak count of Lange's metalmark butterflies at Antioch Dunes NWR was 1,185 individuals in 2000, but dropped to 45 by 2006, rose slightly to 132 in 2008, and subsequently declined to 46 in 2009 and to only 28 butterflies in 2010 (USFWS 2010a; USFWS 2010b). In 2009 surveys, 4,124 Contra Costa wallflower plants and 1,384 Antioch Dunes evening primrose plants were counted at Antioch Dunes NWR (USFWS 2009a; USFWS 2009b). The highest recorded census for Contra Costa wallflower at Antioch Dunes NWR was 11,567 plants in 1999 (USFWS 2009a). The highest recorded census for Antioch Dunes evening primrose at Antioch Dunes NWR was 5,235 plants in 1990 (USFWS 2009b).

Antioch Dunes evening primrose, Contra Costa wallflower, and naked-stemmed buckwheat, the larval host plant of Lange's metalmark butterfly, require open sandy substrate for survival. Noxious weeds (e.g., yellow starthistle, winter vetch, and ripgut brome) are the greatest threat to these endangered species at the Antioch Dunes NWR (USFWS 2001c; USFWS 2009a; USFWS 2009b; USFWS 2010a). Invasive, non-native vegetation affects Antioch Dunes evening primrose, Contra Costa wallflower, and naked-stemmed buckwheat by out-competing them for space, sunlight, moisture, and nutrients as well as increasing fuel loads (Pavlik and Manning 1993). A soil evaluation conducted for the Antioch Dunes NWR found that Antioch Dunes evening primrose, Contra Costa wallflower, and naked-stemmed buckwheat are more competitive growing in or better adapted to less-fertile soils or areas of low-percent vegetative cover (Jones and Stokes 2000). Despite significant efforts in 2006, 2007, 2008, and 2009 to manage invasive weeds, populations continue to thrive throughout the refuge (USFWS 2009a; USFWS 2009b).

Excessive nitrogen deposition is strongly correlated with the growth of non-native vegetation (Huenneke et al 1990; Inouye and Tilman 1995; Weiss 1999; Bowman and Steltzer 1998; Brooks 2003) and field studies have found that nitrogen fertilization in sites with elevated nitrogen deposition will enhance grass invasion (Rillig et al 1998; Brooks 2003). Several recent studies have attempted to quantify the critical load or rate at which nitrogen deposition begins to result in adverse effects to nitrogen-sensitive ecosystems. Studies in the United Kingdom suggest that the critical load ranges from 10 to 20 kilograms of nitrogen per hectare per year (kg/ha/yr) for mobile and fixed sand dune ecosystems (Jones et. al. 2004; Plassmann, et. al. 2009). Fenn et. al. (2003) counter that estimated nitrogen deposition thresholds for ecological effects for other geographic regions are frequently not applicable to the western United States. Research conducted in the South San Francisco Bay area on grasslands in nutrient-poor serpentinic soils indicates that intensified annual grass invasions can occur in areas with nitrogen deposition levels of 11 to 20 kg/ha/yr, with relatively limited invasions at levels of 4 to 5 kg/ha/yr (Weiss 2006b). In previous northern California power plant cases licensed by the Energy Commission (e.g., CEC 2007) as well as a California-wide study of nitrogen deposition (Weiss 2006a), 5 kg/ha/yr was used as a benchmark for analyzing nitrogen deposition impacts to plant communities; this benchmark was also used as the significance threshold in the applicant's nitrogen deposition impact analysis (CH2MHILL 2010g, Data Response #72). Regardless of the

numerical threshold/screening level/benchmark, Antioch Dunes NWR and the endangered species therein are evidently experiencing habitat degradation likely caused by nitrogen fertilization.

An Energy Commission Public Interest Energy Research study modeled total nitrogen deposition throughout California (Tonneson et. al. 2007); results showed that most of California experiences elevated rates of annual nitrogen deposition, especially near urban areas. In the area encompassing the Antioch Dunes NWR, the baseline nitrogen deposition rate is estimated to be approximately 6.39 kg/ha/yr (Tonneson et. al. 2007). Although this estimate was produced using 2002 data, it is believed to be the most comprehensive and accurate data set available. Advances in emission control technology and offsets for stationary sources have likely resulted in a decrease of NO_x emissions (BAAQMD 2010a). However, given the increase in vehicle transportation emissions and use of synthetic fertilizers, NH_3 could be increasing, although it is difficult to determine because the reactive nature of NH_3 does not allow for a comprehensive inventory or prediction of long-terms trends (BAAQMD 2009). Therefore, without updated modeling at a similar scale (4 km^2 grid), it is difficult to determine whether this baseline level of nitrogen deposition has changed substantially since 2002.[1]

According to the applicant's response to data request #69 (CH2MHILL 2010g), modeled nitrogen deposition rates from OGS at the Antioch Dunes NWR would average 0.083 kg/ha/yr. Considering OGS in combination with background levels, the nitrogen deposition rate at Antioch Dunes NWR would be approximately 6.47 kg/ha/yr. Given that threats to the endangered species at the Antioch Dunes from noxious weeds are exacerbated by nitrogen fertilization, the proposed project's deposition of additional nitrogen at this already stressed ecosystem would be a significant impact.

Staff's proposed mitigation approach requires the applicant to remit annual payment towards the operation and maintenance budget of the Antioch Dunes NWR. The annual operating budget is approximately $385,000 and includes money for non-native plant removal/fire prevention, sand acquisition, grazing management, butterfly propagation, and rare plant propagation (Picco 2009). Contributing payment would be used to directly implement management activities required to address impacts to the Antioch Dunes NWR from the effects of noxious weed proliferation resulting from nitrogen deposition attributable to OGS.

It is understood that emissions from the proposed OGS project would not be the only source of nitrogen deposition at Antioch Dunes NWR. There are existing industrial stationary sources as well as mobile sources (i.e., transportation) in the San Francisco Bay area that collectively contribute to elevated local and regional nitrogen deposition. Accordingly, staff proposes that the applicant's payment toward the operating budget of Antioch Dunes NWR be proportional to the proposed project's contribution toward total nitrogen deposition at Antioch Dunes NWR. The following equation was developed by staff to calculate the amount of mitigation that would be proportional to the project's

[1] In data response #68 (CH2MHILL 2010g), the applicant estimated the baseline nitrogen deposition rate to be 2.42 kg/ha/yr. These data were collected from a monitoring station in Davis, California, approximately 35 miles north of the proposed project area. This baseline estimate included inorganic wet deposition from nitrate and ammonium. It did not estimate total nitrogen, which also includes dry deposition (a significant proportion of total nitrogen (see Weiss 1999, Tonneson 2007, and Fenn et. al. 2003) and all the nitrogen species (i.e., HNO_3, NH_3, NO, NO_2, N_2O_5, PAN, and aerosol ammonium nitrate [NH_4NO_3]).

contribution to ongoing impacts. Refer also to Condition of Certification **BIO-19** (Antioch Dunes National Wildlife Refuge Funding).

(OGS N-dep at ADNWR / baseline N-dep at ADNWR) X annual operating budget of ADNWR = mitigation $/year

(0.083 kg/ha/yr/6.39 kg/ha/yr) X $385,000 = $5,000.78/year

Each subsequent annual payment would be adjusted for inflation in accordance with the Employment Cost Index – West or its successor, as reported by the U.S. Department of Labor's Bureau of Labor Statistics.

It is staff's determination that implementation of the management activities funded by annual payment toward the operating budget of Antioch Dunes NWR (as calculated using the above equation and described in **BIO-19**) would mitigate adverse impacts to Antioch Dunes NWR and the Antioch Dunes evening primrose, Contra Costa wallflower, and Lange's metalmark butterfly from noxious weed proliferation exacerbated by OGS's contribution to nitrogen deposition. Impacts would be less than significant with the proposed mitigation.

It should be noted that the applicant is proposing to offset the project's NO_x emissions through the purchase of banked emission reduction credits, per the Bay Area Air Quality Management District (BAAQMD) rules and regulations (GB 2009i; refer also to the **Air Quality** section of this Preliminary Staff Assessment for additional information). However, for the following reasons, these offsets would not sufficiently mitigate the project's impacts from nitrogen deposition at the Antioch Dunes NWR:

- Precursor organic compounds (POC) offsets may be used to offset emission increases of NO_x (BAAQMD 2010b, Regulation 2-2-302.2). Reducing POCs does not pertain to nitrogen deposition.
- The NO_x offsets will not address NH_3, which is a substantial contributor to total nitrogen deposition.
- Although the applicant has not identified which emission reduction credits will be used to offset emissions, available offsets will be temporally and spatially variable (e.g., from shutdowns that occurred in the past throughout the greater Bay Area region) and therefore would not directly ameliorate the current nitrogen deposition specifically occurring at Antioch Dunes NWR.

CUMULATIVE IMPACTS

Under CEQA Guidelines, a cumulative impact consists of an impact which is created as a result of the combination of the project together with other projects causing related impacts (Title 14 Cal Code Regs §15130(a)(1)). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects is cumulatively considerable (Title 14 Cal Code Regs §15130(a)). Such incremental effects are to be viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Title 14 Cal Code Regs §15164(b)(1)).

Staff has proposed conditions of certification that are expected to reduce the proposed project's direct impacts to biological resources to a less than significant level. Staff concludes that with implementation of the applicant's proposed mitigation measures and compliance with staff's proposed conditions of certification, the cumulative impacts of the OGS project will be less than cumulatively considerable with respect to special status species, sensitive or rare habitats, or other sensitive biological resources.

The cumulative scenario for biological resources includes past, present, and reasonably foreseeable future projects with emissions that contribute to nitrogen deposition at Antioch Dunes NWR. These projects include the Willow Pass Generating Station (proposed), Marsh Landing Generating Station (Energy Commission approved), Contra Costa Power Plant (existing), Gateway Generating Station (existing), Pittsburg Power Plant (existing), Delta Energy Center (existing), and the Los Medanos Energy Center (existing) as well as several other existing and proposed industrial stationary sources (e.g., manufacturing facilities), mobile sources, and other nitrogen-emitting activities such as aerial application of fertilizer.

The Antioch Dunes NWR is the first and only refuge in the United States established to protect endangered plants and insects (USFWS 2001c). The 67-acre NWR is an isolated patch of a formerly expansive and biologically diverse dune system. The federally endangered Lange's metalmark butterfly, federally and state endangered Antioch Dunes evening primrose, and federally and state endangered Contra Costa wallflower are only known from this location and their numbers are in decline. Lange's metalmark butterfly is critically imperiled. Given the low population numbers and isolated geographic area, the endangered species at the Antioch Dunes NWR are extremely vulnerable to environmental change and stochastic events. The largest threat to these species is noxious weed invasion and the resultant cascading effects (e.g., competition, wildfires). As described above, noxious weed invasion is facilitated by nitrogen deposition, which is a result of the emissions of many sources within the region.

The proposed OGS project would contribute to nitrogen deposition at Antioch Dunes NWR. In consideration of the cumulative nitrogen deposition baseline from applicable regional sources, the project's contribution is relatively small (approximately 1 percent). However, it is the culmination of nitrogen emission sources from similarly small past, present, and reasonably foreseeable future projects that evidently contribute to the current proliferation of noxious weeds at Antioch Dunes NWR. Given the severity of the existing environmental problems at Antioch Dunes NWR, especially related to nitrogen deposition, OGS emissions and the resulting incremental effect to federally endangered Lange's metalmark butterfly, federally and state endangered Antioch Dunes evening primrose, and federally and state endangered Contra Costa wallflower are cumulatively considerable in the absence of mitigation. To this end, staff recommends Condition of Certification **BIO-19** to reduce the project's contribution to cumulative impacts. Per Condition of Certification **BIO-19**, the applicant would provide funding proportional to the proposed project's contribution to nitrogen deposition occurring at Antioch Dunes NWR in order to implement management activities targeting weed removal and propagation/transplantation of listed species. With implementation of this condition, the project's incremental contribution to nitrogen deposition at Antioch Dunes NWR and the resultant indirect impacts would be less than cumulatively considerable.

In addition, implementation of Stationary Source Measures, Mobile Source Measures, and Transportation Control Measures in the BAAQMD's 2010 Clean Air Plan are expected to improve regional NO_x conditions (BAAQMD 2010b). Effective implementation of these measures and programs should reduce nitrogen deposition rates at Antioch Dunes NWR over time.

The USFWS conducts ongoing management of the Antioch Dunes NWR as described in its Comprehensive Conservation Plan in an effort to conserve the last remaining natural populations of Lange's metalmark butterfly, Antioch Dunes evening primrose, and Contra Costa wallflower (USFWS 2001c). By controlling noxious weeds and their resultant cascading effects, these management activities, in effect, also serve to address cumulative effects of regional nitrogen deposition at Antioch Dunes NWR.

COMPLIANCE WITH LORS

The proposed project must comply with state and federal LORS that address state and federally listed species, as well as other sensitive species and their habitats. Applicable LORS are presented in **BIOLOGICAL RESOURCES Table 1**. Under the Warren-Alquist Act (Public Resources Code § 25500) the Energy Commission's certificate for thermal power plants 50 MW and more is "in lieu of" other state, local, and regional permits (ibid.). Staff will incorporate all required terms and conditions that might otherwise be included in state permits into the Energy Commission's certification process. When conditions of certification are finalized they would satisfy the following state LORS and take the place of terms and conditions that, but for the Commission's exclusive authority, would have been included in state permits. The OGS project is subject to the federal, state, and local LORS included in **Biological Resources Tables 1** and **4**. **Biological Resources Table 4** also includes whether the proposed project would be in compliance with the applicable LORS, and a discussion of the compliance status for direct impacts. A discussion of indirect impacts follows the table provided below.

Biological Resources Table 4
Compliance with Federal, State, and Local LORS for Direct Impacts

Applicable Law	In Compliance	Discussion
Federal		
Clean Water Act of 1977 (Title 33, United States Code, sections 1251–1376, and Code of Federal Regulations, part 30, Section 330.5(a)(26))	Yes	Discharge of dredged or fill material into the waters of the United States requires a permit from the U.S. Army Corps of Engineers (USACE). The applicant completed a wetland delineation report which included identification of five waters in the project vicinity which was submitted to the USACE for jurisdictional determination. All were determined to be non-jurisdictional.
Endangered Species Act (Title 16, United States Code, sections 1531 et seq.; Title 50, Code of Federal Regulations, part 17.1 et seq.)	Undetermined – will be determined based upon review of additional information provided by the applicant. The applicant has submitted a draft Planning Survey Report (PSR) to the Conservancy and the Conservancy has provided comments outlining what information is needed before the Conservancy can present it to the Governing Board for approval. Based on the information provided to date, staff anticipates compliance will be achieved through participation in the ECCC HCP/NCCP and implementation of mitigation measures required as part of participation in the ECCC HCP/NCCP.	Potential take of California red-legged frog, giant garter snake, and San Joaquin kit fox, requires compliance with the federal Endangered Species Act (ESA). The applicant is applying for take coverage through the ECCC HCP/NCCP which covers impacts to all of the species covered under the ECCC HCP/NCCP. Permits from USFWS issued to the Conservancy are extended to the applicant pending approval of the project as a Participating Special Entity. Conditions of certification **BIO-14, BIO-16,** and **BIO-17** provide measures to avoid and minimize impacts to these species.
Bald and Golden Eagle Protection Act (Title 16, United States Code section 668)	Undetermined – will be determined based upon review of additional information provided by the applicant. The applicant has submitted a draft PSR to the Conservancy and the Conservancy has provided comments outlining what information is needed before the Conservancy can present it to the Governing Board for approval. Based on the information provided to date, staff anticipates compliance will be achieved through participation in the ECCC HCP/NCCP and implementation of mitigation measures required as part of participation in the ECCC HCP/NCCP.	Golden eagles may use the site and are protected under the Bald and Golden Eagle Protection Act. The golden eagle is listed in the ECCC HCP/NCCP as “no take species,” and no direct take of individuals is allowed. Participation in the ECCC HCP/NCCP requires implementation of minimization measures and construction monitoring. Permits from USFWS issued to the Conservancy are extended to the applicant pending approval of the project as a Participating Special Entity. Condition of Certification **BIO-9** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and Condition of Certification **BIO-7** limits off-site disturbance.
Migratory Bird Treaty Act (Title 16, United States Code,	Yes	Condition of Certification **BIO-9** provides for pre-construction nest

Applicable Law	In Compliance	Discussion
sections 703–711)		surveys, protective buffers, and monitoring if nests are found, and Condition of Certification **BIO-7** limits off-site disturbance.
Migratory Bird Treaty Reform Act (70 F.R. 12710-12716 (March 15, 2005))	Yes	Condition of Certification **BIO-9** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and Condition of Certification **BIO-7** limits off-site disturbance.
State		
California Endangered Species Act (Fish and Game Code, sections 2050 et seq.)	Undetermined – will be determined based upon review of additional information provided by the applicant. The applicant has submitted a draft PSR to the Conservancy and the Conservancy has provided comments outlining what information is needed before the Conservancy can present it to the Governing Board for approval. Based on the information provided to date, staff anticipates compliance will be achieved through participation in the ECCC HCP/NCCP and implementation of mitigation measures required as part of participation in the ECCC HCP/NCCP.	Construction and operation of the proposed project could result in the "take" of giant garter snake, Swainson's hawk, and San Joaquin kit fox, listed under CESA. The applicant is applying take coverage through the ECCC HCP/NCCP which covers impacts to all of the species covered under the ECCC HCP/NCCP. Permits from CDFG issued to the Conservancy are extended to the applicant pending approval of the project as a Participating Special Entity. Condition of Certification **BIO-11** specifies compensatory mitigation for loss of habitat for these species. Conditions of certification **BIO-14, BIO-16,** and **BIO-17** provide measures to avoid and minimize impacts to these species.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Undetermined – will be determined based upon review of additional information provided by the applicant. The applicant has submitted a draft PSR to the Conservancy and the Conservancy has provided comments outlining what information is needed before the Conservancy can present it to the Governing Board for approval. Based on the information provided to date, staff anticipates compliance will be achieved through participation in the ECCC HCP/NCCP and implementation of mitigation measures required as part of participation in the ECCC HCP/NCCP.	The applicant is applying take coverage through the ECCC HCP/NCCP which covers impacts to all of the species covered under the ECCC HCP/NCCP. Conditions of certification **BIO-14, BIO-16,** and **BIO-17** provide measures to avoid and minimize impacts to these species.
California Code of Regulations (Title 20, sections 1702(q) and (v))	Yes	The proposed project is not sited in an area of critical concern for biological resources.

Applicable Law	In Compliance	Discussion
Natural Communities Conservation Planning Act (NCCPA) of 2002 (Fish and Game Code, sections 2800 through 2835)	Undetermined – will be determined based upon review of additional information provided by the applicant. The applicant has submitted a draft PSR to the Conservancy and the Conservancy has provided comments outlining what information is needed before the Conservancy can present it to the Governing Board for approval. Based on the information provided to date, staff anticipates compliance will be achieved through participation in the ECCC HCP/NCCP and implementation of mitigation measures required as part of participation in the ECCC HCP/NCCP.	The applicant is applying take coverage through the ECCC HCP/NCCP which covers impacts to all of the species covered under the ECCC HCP/NCCP. The applicant has submitted a draft PSR to the Conservancy.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Yes	Golden eagles, white-tailed kite, and other bird species that may use the site are California Fully Protected species. Condition of Certification **BIO-8** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and Condition of Certification **BIO-7** limits off-site disturbance.
Native Plant Protection Act (Fish and Game Code, section 1900 et seq.)	Yes	No special-status plants were observed on-site. Special-status plants do not occur, or are not known to historically occur, adjacent to the proposed project.
Nest or Eggs (Fish and Game Code, section 3503)	Yes	Condition of Certification **BIO-9** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, Condition of Certification **BIO-7** limits off-site disturbance, and **BIO-5** includes a Worker Environmental Awareness Program (WEAP) to educate workers about compliance with environmental regulations, including Fish and Game Code section 3503.
Birds of Prey (Fish and Game Code, section 3503.5)	Yes	Condition of Certification **BIO-9** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, Condition of Certification **BIO-7** limits off-site disturbance, and **BIO-5** includes a WEAP to educate workers about compliance with environmental regulations, including Fish and Game Code section 3503.5.
Migratory Birds	Yes	Condition of Certification **BIO-9**

Applicable Law	In Compliance	Discussion
(Fish and Game Code, section 3513)		provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and Condition of Certification **BIO-7** limits off-site disturbance, and **BIO-5** includes a WEAP to educate workers about compliance with environmental regulations, including Fish and Game Code section 3513.
Significant Natural Areas (Fish and Game Code section 1930 et seq.)	Yes	The proposed project is not sited in a significant natural area.
Public Resources Code, sections 25500 and 25527	Yes	The proposed project is not sited in an area of critical concern for biological resources.
Local		
East Contra Costa County Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP)	Undetermined – will be determined based upon review of additional information provided by the applicant. The applicant has submitted a draft PSR to the Conservancy and the Conservancy has provided comments outlining what information is needed before the Conservancy can present it to the Governing Board for approval. Based on the information provided to date, staff anticipates compliance will be achieved through participation in the ECCC HCP/NCCP and implementation of mitigation measures required as part of participation in the ECCC HCP/NCCP.	The applicant is applying take coverage through the ECCC HCP/NCCP which covers impacts to all of the species covered under the ECCC HCP/NCCP. Permits from CDFG and USFWS issued to the Conservancy are extended to the applicant pending approval of the project as a Participating Special Entity.
City of Oakley General Plan	Yes	Impacts within Oakley are within previously disturbed lands.
City of Oakley Tree Preservation Ordinance	Undetermined – will be determined based upon review of additional information provided by the applicant. The applicant has submitted a draft tree survey report which will be updated prior to publication of FSA.	The applicant is preparing an arborist report that will be used to assess fees for removal of protected trees. Condition of Certification **BIO-8** provides for payment of these fees.
City of Antioch General Plan – Resource Management Element	Yes	Impacts within Antioch are within previously disturbed lands.
City of Antioch Tree Preservation Ordinance	Undetermined – will be determined based upon review of additional information provided by the applicant. The applicant has submitted a draft tree survey report which will be updated prior to publication of FSA.	The applicant is preparing an arborist report that will be used to assess fees for removal of protected tress. Condition of Certification **BIO-8** provides for payment of these fees.

INDIRECT IMPACTS

LORS compliance issues for indirect effects of the proposed project are discussed below.

Federal Endangered Species Act (ESA; 16 USC Section 1531 et seq.)

Federal agencies must ensure that any federal action is (1) not likely to jeopardize the continued existence of any federally listed species, or (2) result in the destruction or adverse modification of the designated critical habitat of a federally listed species (ESA Section 7(a)(2), 16 U.S. C. § 1536(a)(2)). Although there is no federal nexus and therefore Section 7 is not applicable to this project, staff must independently review the proposed project for compliance with the federal ESA given the potential for the project to adversely affect federally listed species (i.e., federally endangered Lange's metalmark butterfly, federally endangered Antioch Dunes evening primrose, and federally endangered Contra Costa wallflower).

Potential take of federally-listed species requires compliance with the federal ESA. "Take" of a federally-listed species is prohibited without a permit. The definition of "take" under ESA section 3(19) includes "harm". Harm is further defined to include "significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering" (50 CFR section 17.3). It is staff's opinion that the proposed project's relatively small incremental contribution to cumulative nitrogen deposition and the resultant habitat degradation at Antioch Dunes NWR would not result in harm, as described above.

In its comment letter on the OGS project (USFWS 2010b), see also **Response to Agency Comments** subsection), the USFWS recommended that the applicant ensure that the proposed project does not result in adverse modification of critical habitat. Recent court cases have challenged the definition of "adverse modification"; however, it remains that "adverse modification" occurs only when there is "a direct or indirect alteration that appreciably diminishes the value of critical habitat." 50 C.F.R. § 402.02. As the USFWS consultation handbook (USFWS 1998) explains:

> *Adverse effects on individuals of a species or constituent elements or segments of critical habitat generally do not result in jeopardy or adverse modification determinations unless that loss, when added to the environmental baseline, is likely to result in significant adverse effects throughout the species' range, or appreciably diminish the capability of the critical habitat to satisfy essential requirements of the species.*

OGS emissions and the resultant nitrogen deposition constitute approximately one percent of the cumulative nitrogen deposition at the Antioch Dunes NWR. It is clear that nitrogen deposition is resulting in cumulative adverse effects to endangered species critical habitat; however, it is staff's opinion that the proposed project's relatively small incremental contribution to cumulative nitrogen deposition and the resultant habitat degradation at Antioch Dunes NWR would not meet the definition of adverse modification of critical habitat for Antioch Dunes evening primrose and Contra Costa wallflower.

Therefore, it is staff's preliminary determination that the proposed project would comply with the federal ESA. However, this determination may be in conflict with the opinion of the USFWS, as described below under **Response to Agency Comments**. Staff will continue to work with USFWS throughout this proceeding.

California Endangered Species Act (Fish and Game Code Section 2050 et seq.)

The California Endangered Species Act (CESA) prohibits the "take" (defined as "to hunt, pursue, catch, capture, or kill") of state-listed species (i.e., state-endangered Antioch Dunes evening primrose, and state-endangered Contra Costa wallflower). It is staff's opinion that the proposed project's relatively small incremental contribution to cumulative nitrogen deposition and the resultant habitat degradation at Antioch Dunes NWR would not result in take, as defined above. Therefore, it is staff's preliminary determination that the proposed project would comply with CESA. However, this determination may be in conflict with the opinion of CDFG, as described below under **Response to Agency Comments**. Staff will continue to work with CDFG throughout this proceeding.

NOTEWORTHY PUBLIC BENEFITS

The applicant, in coordination with California Department of Fish and Game (CDFG), has proposed enhancement measures that have the potential to improve the existing wetland and upland habitats located within the 1.60-acre conservation easement identified as the Wetland E Mitigation Area. The resulting improvements to wildlife habitat value and enhancement goals of the Wetland E Mitigation Area are a noteworthy environmental public benefit.

RESPONSE TO AGENCY COMMENTS

Staff received formal comments from USFWS regarding the proposed OGS project (USFWS 2010b). Pertinent comments are summarized below and staff's response is provided for each.

Comment: USFWS is concerned that the indirect and cumulative effects of additional nitrogen from the proposed project that will be deposited at Antioch Dunes NWR may reverse or negate the intensive conservation efforts that have been and are being implemented to prevent the decline and perhaps extinction of the endangered Lange's metalmark butterfly.

> **Response:** Staff agrees that the project's indirect effects will be cumulatively considerable and has proposed Condition of Certification **BIO-19** to mitigate cumulative and indirect impacts by directly support the ongoing intensive conservation efforts being implemented at Antioch Dunes NWR. Funding required in **BIO-19** would support a level of effort towards conservation actions at Antioch Dunes NWR that is proportional to the impacts attributable to OGS.

Comment: USFWS recommends that the applicant: (1) ensure the proposed Oakley Generating Station does not jeopardize Lange's metalmark butterfly, Contra Costa

wallflower and Antioch Dunes evening primrose, or result in adverse modification or destruction of critical habitat for these two endangered plants; and (2) obtain authorization for incidental take from the Service for the endangered Lange's metalmark butterfly prior to any earthmoving at the proposed project site.

> **Response:** For the reasons described above under **LORS Compliance**, staff has made a preliminary determination that the proposed project's relatively minor contribution to total nitrogen deposition and the resultant minor incremental effects to habitat at Antioch Dunes NWR would itself not result in take (or jeopardy) of Lange's metalmark butterfly, Contra Costa wallflower, and Antioch Dunes evening primrose or adverse modification of critical habitat. However, this is ultimately the determination of USFWS.

Comment: USFWS identified the following conservation measures to ensure the proposed action does not jeopardize Lange's metalmark butterfly, Contra Costa wallflower and Antioch Dunes evening primrose, or result in adverse modification or destruction of critical habitat for these two endangered plants. USFWS recommends that these measures be implemented for the operational life of the OGS project.

- Annual removal of all exotic weeds from a quarter of the Antioch Dunes NWR. Removal methods should include cattle (*Bos taurus*) or other appropriate grazing animals, hand tools, and appropriate mechanical equipment;
- Annual cultivation of at least 250 individuals of naked-stem buckwheat, 100 individuals of Contra Costa wallflower, and 100 individuals of Antioch Dunes evening primrose, and the planting of these individuals on the Refuge with a success criteria of 50 percent after five years; and
- Captive breeding of Lange's metalmark butterfly and the annual release of at least 200 individuals on the Refuge.

> **Response:** Staff believes that the conservation measures recommended by USFWS are disproportionate to the OGS project's impacts. The OGS project would contribute approximately 1 percent to the cumulative nitrogen deposition at Antioch Dunes and staff recommends mitigation (**BIO-19**) that is proportional to this impact as required by CEQA section 15126.4(a)(4)(B).
>
> It is staff's responsibility to conduct an environmental analysis of the proposed project per CEQA and provide determinations of the proposed project's conformance with applicable LORS. Implementation of **BIO-19** would mitigate impacts below the level of significance as required by CEQA. Furthermore, staff believes that the project would not result in "take" or "jeopardy" of endangered species or "adverse modification of critical habitat" as defined in the federal Endangered Species Act (ESA). Therefore, staff cannot recommend the conservation measures presented by USFWS in its comment letter. However, the ultimate determination of compliance with the Federal ESA is provided by USFWS.

CDFG has not submitted formal comments on the OGS project. However, based on CDFG comments on the Marsh Landing Generating Station (MLGS) (CDFG 2010b) and because the same mitigation approach used in MLGS is recommended by staff for OGS, it is reasonable to assume that CDFG would have a similar position on OGS.

Staff has requested estimations of future increases in Antioch Dunes NWR management costs (with assumptions) from CDFG, but has not received any information to be considered for incorporation into the mitigation equation used to develop **BIO-19**. Staff will continue to work with CDFG throughout this proceeding.

CONCLUSIONS

Direct impacts would largely be minimized because the proposed power plant site, construction laydown areas, and proposed linear facilities routes (i.e., transmission, sanitary sewer, and natural gas) are primarily disturbed or developed and surrounded by heavy industrial, vacant industrial, commercial, and agricultural uses including the former DuPont Oakley manufacturing site and marinas along the San Joaquin River to the north, the Atchison, Topeka, and Santa Fe railroad to the south, and the PG&E Antioch Terminal to the west. The proposed electrical interconnection between the OGS and the electrical grid would be from the new OGS switchyard (located within the OGS site boundary) to the 230-kilovolt Contra Costa Substation along an existing 2.4 mile long transmission line route. The transmission line would have the existing steel lattice towers replaced with steel-pole structures at appropriate intervals. The existing PG&E right-of way is primarily disturbed or developed and is surrounded by vacant industrial, commercial, agricultural, and residential uses. The potential for the project area to support sensitive biological resources is moderate; the immediate vicinity supports wildlife that are likely habituated to frequent disturbance.

The applicant is applying as a Participating Special Entity with the East Contra Costa County Habitat Conservancy (Conservancy) to receive endangered species permits for species covered under the East Contra Costa County Habitat Conservation Plan / Natural Community Conservation Plan (ECCC HCP/NCCP). The Conservancy is a joint exercise of powers authority formed by the Cities of Brentwood, Clayton, Oakley and Pittsburg and Contra Costa County to implement the ECCC HCP/NCCP. Approval of the Participating Special Entity application by the Conservancy consists of several phases which include the following: a complete Planning Survey Report (PSR) Application is received and approved; the Conservancy finds the proposed activity complies with all terms and requirements of the ECCC HCP/NCCP; an Agreement is executed with the Participating Special Entity binding them to the relevant terms of the ECCC HCP/NCCP; the Governing Board approves the Agreement and PSR, all development and staff time fees will be paid, and the U. S. Fish and Wildlife Service and California Department of Fish and Game provide concurrence. The project is expected to be presented to the Conservancy's Governing Board in March 2011. Staff received a copy of the draft PSR (CH2MHILL 2010s); the final PSR is still in development, therefore the required mitigation measures required by the Conservancy are subject to modification (Krystal Hinojosa pers. comm.). Energy Commission staff have reviewed and incorporated relevant technical information from the draft PSR into this Preliminary Staff Assessment and have incorporated the Conservancy's mitigation measures in staff's proposed conditions of certification.

Direct impacts to the majority of special-status species would be avoided and minimized by conducting comprehensive pre-construction surveys and erecting wildlife exclusion fencing before site mobilization. Impact avoidance and minimization measures

described in staff's analysis and included in the proposed conditions of certification would help reduce impacts to sensitive biological resources. These measures along with the mitigation provided by participation in the ECCC HCP/NCCP would likely offset project related losses to biological resources to less-than-significant levels. With implementation of applicant-proposed avoidance and minimization measures and staff's proposed conditions of certification, direct impacts to biological resources would likely be less than significant.

Indirect impacts to the Antioch Dunes National Wildlife Refuge (NWR) and associated protected species would result from nitrogen deposition caused by OGS emissions. The Antioch Dunes NWR contains the last known populations of the federally endangered Lange's metalmark butterfly, federally and state endangered Antioch Dunes evening primrose, and federally and state endangered Contra Costa wallflower. The greatest threat to these listed species is noxious weed invasion and the resultant cascading effects (e.g., competition, wildfire) are exacerbated by nitrogen deposition. Emissions from the proposed project would deposit an average of approximately 0.083 kilogram per hectare per year (kg/ha/yr) of nitrogen at the Antioch Dunes NWR. Additional nitrogen deposition at this already stressed ecosystem would be a significant impact.

It is staff's determination that implementation of the management activities funded by annual payment toward the operating budget of Antioch Dunes NWR (as described in **BIO-19** (Antioch Dunes National Wildlife Refuge Funding)) would mitigate adverse impacts to Antioch Dunes NWR and the Antioch Dunes evening primrose, Contra Costa wallflower, and Lange's metalmark butterfly from noxious weed proliferation exacerbated by OGS's contribution to nitrogen deposition. Indirect and cumulative impacts would be less than significant with mitigation.

Staff's preliminary determination is that the proposed project would comply with the federal ESA for indirect impacts to the Antioch Dunes National Wildlife Refuge (NWR) and associated protected species. However, this determination may be in conflict with the opinion of the USFWS, as described under **Response to Agency Comments**. Staff will continue to work with USFWS throughout this proceeding. CDFG has not submitted formal comments on the OGS project. However, based on CDFG comments on the Marsh Landing Generating Station (MLGS) (CDFG 2010b) and because the same mitigation approach used in MLGS is recommended by staff for OGS, it is reasonable to assume that CDFG would have a similar position on OGS. Staff has requested estimations of future increases in Antioch Dunes NWR management costs (with assumptions) from CDFG, but has not received any information to be considered for incorporation into the mitigation equation used to develop **BIO-19**. Staff will continue to work with CDFG throughout this proceeding. CDFG has indicated they intend to wait until the PSA is published to make any comments on how the nitrogen deposition issue is handled in the PSA (CEC 2010i)

With implementation of applicant-proposed impact avoidance and minimization measures and staff's proposed conditions of certification, the project would be in compliance with most federal, state, and local laws, ordinances, regulations, and standards (LORS) relating to biological resources. LORS compliance is currently undetermined for the federal Endangered Species Act, Bald and Golden Eagle Protection Act, California Endangered Species Act, California Code of Regulations (Title

14, sections 670.2 and 670.5), Natural Communities Conservation Planning Act (NCCPA) of 2002, East Contra Costa County Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP), City of Oakley Tree Preservation Ordinance, and the City of Antioch Tree Preservation Ordinance. Based on the information provided to date, staff anticipates compliance with the above-listed LORS will be achieved through participation in the ECCC HCP/NCCP and implementation of mitigation measures required as part of participation in the ECCC HCP/NCCP as well as payment of required fees to the City of Oakley and City of Antioch for removal of protected trees. Compliance with LORS will be determined based upon review of additional information provided by the applicant. Staff is continuing to work with the applicant and the Conservancy to resolve any outstanding information needs prior to publication of the Final Staff Assessment (FSA). This includes the following:

- The revised calculations of impact fees to be paid to the ECCC HCP/NCCP and any modifications to mitigation measures to be included in the Final Planning Survey Report (PSR); and
- Arborist report, including updated tree survey results, which would be used to determine fees to be paid to the City of Oakley and City of Antioch for removal of protected trees.

Any additional requirements within the PSR will be reviewed and incorporated into staff's Final Staff Assessment (FSA), as appropriate. Additional conditions of certification or modifications to currently proposed conditions of certification are likely based on resolution of the outstanding items described above and will be included in the FSA.

PROPOSED CONDITIONS OF CERTIFICATION

Staff proposes the following Conditions of Certification:

Designated Biologist Selection

BIO-1 The project owner shall assign a Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least 3 references and contact information, to the Energy Commission Compliance Project Manager (CPM) for approval.

The Designated Biologist must meet the following minimum qualifications:

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

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: The project owner shall submit the specified information at least 60 days prior to the start of any site (or related facilities) mobilization. No site or related facility activities shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least ten (10) working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

Designated Biologist Duties

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by the approved Biological Monitor(s), (see **BIO-3** below), but remains the contact for the project owner and CPM.

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;

2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), to be submitted by the project owner;

3. Be available to supervise, conduct and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special status species or their habitat;

4. Clearly mark sensitive biological resource areas if present and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (i.e. parking lots) for animals in harm’s way;

6. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification;

7. Respond directly to inquiries of the CPM regarding biological resource issues;

8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the Monthly Compliance Report and the Annual Report; and

9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training and all permits.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to the CPM copies of all written reports and summaries that document biological resources activities. Monthly Compliance Reports will also be submitted to the East Contra Costa County Habitat Conservancy (Conservancy). If actions may affect biological resources during operation, a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless their duties are ceased as approved by the CPM.

Biological Monitor Qualifications

BIO-3 The project owner's CPM-approved Designated Biologist shall submit the resume, at least 3 references and contact information, of the proposed Biological Monitors to the CPM for approval. The resume shall demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks.

Biological Monitor(s) training by the Designated Biologist shall include familiarity with the Conditions of Certification and the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), WEAP, and all state, federal, and local permits.

Verification: The project owner shall submit the specified information to the CPM for approval at least 30 days prior to the start of any site (or related facilities) mobilization~~.~~. The Designated Biologist shall submit a written statement to the CPM confirming that individual Biological Monitor(s) have been trained including the date when training was completed~~.~~. If additional biological monitors are needed during construction the specified information shall be submitted to the CPM for approval 10 days prior to their first day of monitoring activities.

Designated Biologist and Biological Monitor Authority

BIO-4 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification.

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

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;

2. Inform the project owner and the Construction/Operation Manager when to resume activities; and

3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the work stoppage.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

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

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

Worker Environmental Awareness Program

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

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media is made available to all participants;

2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, if present;

3. Present the reasons for protecting these resources;

4. Present the meaning of various temporary and permanent habitat protection measures as necessary;

5. Discuss penalties for violation of applicable LORS (e.g., federal and state endangered species acts);

6. Identify whom to contact if there are further comments and questions about the material discussed in the program; and

7. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

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

Verification: At least 60 days prior to the start of any site (or related facilities) mobilization, the project owner shall provide to the CPM the proposed WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program. At least 10 days prior to site and related facilities mobilization, the project owner shall submit two copies of the CPM-approved materials. The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

Training acknowledgement forms signed during construction shall be kept on file by the project owner for a period of at least six months after the start of commercial operation.

During project operation, signed statements for operational personnel shall be kept on file for six months following the termination of an individual's employment.

Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)

BIO-6 The project owner shall develop a BRMIMP and submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG, USFWS, and the East Contra Costa County Habitat Conservancy (Conservancy) (for review and comment) if applicable and shall implement the measures identified in the approved BRMIMP.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall identify:

1. all biological resource mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;

2. all applicant-proposed mitigation measures presented in the Application For Certification, data request responses, and workshop responses;

3. all biological resource conditions of certification identified as necessary to avoid or mitigate impacts;

4. all biological resources mitigation, monitoring, and compliance measures required in the East Contra Costa County Habitat Conservation

Plan/Natural Communities Conservation Plan (ECCC HCP/NCCP) terms and conditions, as approved by the East Contra Costa County Habitat Conservancy (Conservancy);

5. all biological resource mitigation, monitoring, and compliance measures required in other state agency terms and conditions, such as those provided in the National Pollution Discharge Elimination System (NPDES) Construction Activities Stormwater General Permit;

6. all biological resource mitigation, monitoring, and compliance measures required in local agency permits, such as site grading and landscaping requirements;

7. a list of all sensitive biological resources to be impacted, avoided, or mitigated during project construction, operation, and closure;

8. all required mitigation measures for each sensitive biological resource;

9. a detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

10. all locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;

11. aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities — one set prior to any site (and related facilities) mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen;

12. duration for each type of monitoring and a description of monitoring methodologies and frequency;

13. performance standards to be used to help decide if/when proposed mitigation is or is not successful;

14. all performance standards and remedial measures to be implemented if performance standards are not met;

15. a preliminary discussion of biological resources-related facility closure measures; and

16. a process for proposing BRMIMP modifications to the CPM and appropriate agencies for review and approval.

Verification: The project owner shall provide the draft BRMIMP to the CPM at least 60 days prior to start of any site (or related facilities) mobilization. The CPM, in consultation with the East Contra Costa County Habitat Conservancy (Conservancy) (and USFWS and CDFG if they choose to comment), will determine the BRMIMP's acceptability within forty-five (45) days of receipt. If there are any permits that have not

yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM within five (5) days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. Ten days prior to site and related facilities mobilization the revised BRMIMP shall be resubmitted to the CPM.

The project owner shall notify the CPM no less than five working days before implementing any modifications to the approved BRMIMP to obtain CPM approval. Any changes to the approved BRMIMP must also be approved by the CPM, in consultation with the Conservancy, (and USFWS and CDFG if they choose to comment), to ensure no conflicts exist.

Implementation of BRMIMP measures will be reported in the Monthly Compliance Reports by the Designated Biologist (i.e., survey results, construction activities that were monitored, species observed). Within thirty (30) days after completion of project construction, the project owner shall provide to the CPM, for review and approval a written construction completion report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases, and which mitigation and monitoring items are still outstanding. Additional copies shall be provided to the East Contra Costa County Habitat Conservancy, CDFG, and USFWS.

General Impact Avoidance and Minimization Measures

BIO-7 The project owner shall implement the following measures during construction and operation to manage their project site and related facilities in a manner to avoid or minimize impacts to the local biological resources:

1. Limit Disturbance Area. Clearly demarcate construction exclusion zones around biologically sensitive areas, including but not limited to, East Antioch Creek and other aquatic resources (Wetland E, Wetland D, and Wetland F), the row of *Eucalyptus* trees (excluding the 25 feet of trees to be removed) and the group of trees growing in the ruderal grassland near the laydown area, and any other sensitive biological resources identified during pre-construction surveys. Vehicles and personnel shall be prohibited from entering sensitive habitats.

2. Minimize Impacts of Transmission Lines. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the *Avian Power Line Interaction Committee (APLIC), Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) to reduce the likelihood of electrocutions of large birds. Bird flight diverters shall also be installed to reduce the likelihood of avian collisions with the transmission line. Bird flight diverters such as the Swan-Flight Diverter (Tyco Electronics) shall be installed.

3. Avoid Use of Toxic Substances. Road surfacing and sealants as well as soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

4. Minimize Lighting Impacts. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards the project boundaries. Lighting shall be shielded, directional, and at the lowest intensity required for safety.

5. Avoid Wildlife Pitfalls. At the end of each work day, the Designated Biologist shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access. Should wildlife become trapped, the Designated Biologist or Biological Monitor shall remove and relocate the individual to a safe location. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

6. Avoid Entrapment of Wildlife. Any construction pipe, culvert, or similar structure with a diameter greater than 3 inches, stored less than 8 inches above ground for one or more days/nights, shall be inspected for wildlife before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored, or placed on pipe racks.

7. Report Wildlife Injury and Mortality. Report all inadvertent deaths of special-status species to the appropriate project representative, including road kill. Species name, physical characteristics of the animal (sex, age class, length, weight), and other pertinent information shall be noted and reported in the Monthly Compliance Reports. Injured animals shall be reported to CDFG or USFWS and the CPM and the project owner shall follow instructions that are provided by CDFG or USFWS.

8. Avoid Use of Exotic Pest Plants. Eliminate from landscaping plans any 'List A' California exotic pest plants of concern as defined by the California Exotic Pest Plant Council.

9. Worker Guidelines. During construction all trash and food-related waste shall be placed in self-closing containers and removed daily from the site. Workers shall not feed wildlife or bring pets to the project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist. Photographic verification of all bird flight diverters installed will be provided upon installation and provided in the Monthly Compliance Report. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed. Additional copies shall be provided to the East Contra Costa County Habitat Conservancy, CDFG, and USFWS.

Protected Trees Mitigation Fees

BIO-8 To comply with various protected tree ordinances, the project owner shall pay mitigation fees for loss of protected trees based on the results of the applicant's arborist report. Fees will be assessed by the City of Oakley and City of Antioch based on review of the arborist report.

Verification: A copy of the receipt of payment to the City of Oakley and the City of Antioch, verifying that the protected tree mitigation fees have been paid, according to the conditions specified above, shall be provided to the CPM prior to tree removal.

Pre-Construction Nest Surveys and Impact Avoidance and Minimization Measures for Breeding Birds

BIO-9 Pre-construction nest surveys shall be conducted if construction activities will occur from March 1 through September 15. At all times of the year, noise generating activities (above 60 dBA) shall be avoided during dawn and dusk to avoid impacts to birds protected under the Migratory Bird Treaty Act. These measures are subject to modification during ongoing coordination with the East Contra Costa County Habitat Conservancy (Conservancy). The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting habitat in the project site and within 150 feet of the boundaries of the plant site as well as the sanitary sewer force main route and transmission line right-of-way. Surveys specifically for nesting Swainson's hawk shall be conducted within 1,000 feet of designated disturbance areas that contain appropriate nesting habitat. Surveys specifically for nesting golden eagle shall be conducted within 1/2 mile of designated disturbance areas that contain appropriate nesting habitat. If a potential Swainson's hawk nests is located within 1,000 feet of the project site, occupancy may be determined by observation from public roads or by observations of Swainson's hawk activity (e.g. foraging) near the project site.

2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. Pre-construction surveys shall be conducted no more than 30 days prior to initiation of construction activity. One survey needs to be conducted within the 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation.

3. If active nests are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with the CPM, CDFG, and USFWS) and monitoring plan shall be developed; Consultation with the CPM and CDFG shall be required for any construction that occurs within 1,000 feet of a Swainson's hawk nest or 1/2 mile of an active golden eagle nest to ensure that no take of

Swainson's hawk or golden eagle occurs during project construction. Nest locations shall be mapped using GPS technology and submitted, along with a weekly report stating the survey results, to the CPM.

4. If Swainson's hawk young fledge prior to September 15, construction activities can proceed normally. If the active nest site is shielded from view and noise from the project site by other development, topography, or other features, the project applicant can apply to the Conservancy for a waiver of the no-disturbance buffer zone requirements. The waiver must also be approved by the CDFG and USFWS and the CPM must be notified of any request for a waiver.

5. The Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed. Activities that might, in the opinion of the Designated Biologist, disturb nesting activities (e.g., excessive noise above 60 dBA, especially during steam blowing), shall be

Verification: At least 10 days prior to the start of any ground disturbing activities or construction equipment staging, the project owner shall provide the CPM and the East Contra Costa County Habitat Conservancy (Conservancy) a letter-report describing the findings of the pre-construction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed.

If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no-disturbance buffer zone around the nest, and a monitoring plan shall be submitted to the Conservancy for review and comment and the CPM for approval. Additional copies shall be provided to the CDFG and USFWS. Approval of the plan is required before construction may commence. All impact avoidance and minimization measures related to nesting birds shall be included in the BRMIMP and implemented.

Impact Avoidance and Minimization Measures for Bats

BIO-10 The project owner shall conduct a survey for roosting bats within 200 feet of project activities within 15 days prior to any construction activities. All trees and snags proposed for removal, topping, or pruning shall be marked in the field. A qualified bat biologist shall conduct a roost assessment of all the marked trees. The biologist shall be approved by the CPM. If no suitable roosting habitat is present, no further action is required.

If suitable roosting habitat is present, the project owner shall also conduct surveys for roosting bats during the maternity season (March 1 to August 31) within 200 feet of project activities. Trees and other appropriate structures shall be surveyed by a qualified bat biologist. Surveys shall include a minimum of one day and one evening survey. The biologist shall be approved by the CPM. If active maternity roosts or hibernacula are found, the trees occupied by the roost shall be avoided (i.e., not removed) by the project, if feasible. If avoidance of the maternity roost is not feasible, the bat biologist shall survey (through the use of radio telemetry or other CPM-approved methods, developed in consultation with CDFG) for nearby alternative

maternity colony sites. If the bat biologist determines, in consultation with CDFG and with the approval of the CPM, that there are alternative roost sites used by the maternity colony and young are not present, then no further action is required and tree removal may occur.

However, if there are no alternative roosts sites used by the maternity colony, provision of substitute roosting bat habitat would be required. This measure would not apply to western red bat as they are solitary and primarily use trees as roosts. If western red bats are present during the breeding season, tree removal would not occur during the breeding season and Item 3 below would be implemented. If active maternity roosts are absent, but a hibernaculum (i.e., a non-maternity roost) is present, then exclusion of bats prior to tree removal is required.

1. Provision of substitute roosting bat habitat~~.—~~. If a maternity roost will be impacted by the project, and no alternative maternity roosts are in use near the site, substitute roosting habitat for the maternity colony shall be provided on, or in close proximity to, the project site no less than three months prior to the eviction of the colony. Alternative roost sites will be designed and constructed in accordance with the specific bats' requirements and in coordination with CDFG and the CPM. Alternative roost sites must be of comparable size and proximal in location to the impacted colony. The CDFG shall also be notified of any hibernacula or active nurseries within the construction zone.

2. Exclude bats prior to removal of trees with roosts~~.—~~. If non-breeding bat hibernacula are found in the trees to be removed within the construction footprint, the individuals shall be safely evicted, under the direction of the qualified bat biologist, by partial dismantling of roost sites (e.g. removal of tree limbs) to induce abandonment by bats, or other appropriate measures. Additionally, on the day of tree removal the tree cutters will inspect the trees prior to them felling the trees for bats in areas that the Designated Biologist is not able to observe from the ground.

   If an active maternity roost is located in an area to be impacted by the project, and alternative roosting habitat is available, the demolition of the roost site must commence before maternity colonies form (i.e., prior to March 1) or after young are flying (i.e., after August 31) using the exclusion techniques described above.

3. Western red bat specific measures~~.—~~. If an active western bat maternity roost is found in the trees to be removed, tree removal will not occur during the breeding season to avoid disturbing females with non-volant (incapable of flying) young (March 1 through August 31). The leaf litter associated with the tree(s) will be removed during the warm season to prevent western red bats from roosting under the leaf litter during the winter when tree removal will occur. Prior to tree removal, outside of the breeding period, on the day immediately preceding tree removal, any tree to be removed will first be disturbed at the end of the day (after 5:00 pm) by removing the lowest branches that do not have dense clusters of

leaves. Trees should be removed the day after the initial disturbance as bats disturbed under these circumstances are not likely to return to the same tree for day roosting the next day. Additionally, on the day of tree removal the tree cutters will inspect the trees prior to them felling the trees for bats in areas that the Designated Biologist is not able to observe from the ground.

4. Bat maternity roosts in trees to remain on site. The Designated Biologist shall monitor the maternity roost until it is determined that young are volant (are capable of flying); activities that might, in the opinion of the Designated Biologist, disturb roosting activities (e.g., excessive noise above 60 dBA, especially during steam blowing), shall be prohibited within the buffer zone until such a determination is made.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. The resume of the proposed bat biologist will be submitted to the CPM for approval at least 30 days prior to the start of any bat surveys. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist. If active roost trees are to be removed, a written report summarizing the results of the pre-construction survey shall be sent to the CPM and CDFG no less than 15 days prior to the start of ground disturbance which will include documentation of any active roost trees to be removed. The report shall describe survey methods, including the time, date, and duration of the survey, identity and qualifications of the surveyor(s), and a list of species observed, a figure showing roost locations observed, and proposed mitigation and exclusion measures. Mitigation and exclusion measures must be developed in coordination with CDFG, and approved by the CPM prior to initiation of the measures or construction activities that would disturb the roost site. Within 10 days of removal of trees with roost sites, the project owner shall submit a report describing the results of the exclusion, mitigation measures, and tree removal.

Swainson's Hawk Nest Tree Mitigation and Monitoring

BIO-11 If pre-construction surveys locate active Swainson's hawk nests in trees which are to be removed, the project owner shall implement the following measures to minimize impacts to breeding Swainson's hawk. These measures are subject to modification during ongoing coordination with the East Contra Costa County Habitat Conservancy (Conservancy).

1. All active Swainson's hawk nest trees will be preserved on site, if feasible. Nest trees, including non-native trees, lost to project activities will be mitigated by the project owner according to the requirements of the ECCC HCP/NCCP including the following:

   a. Loss of nest non-riparian nest trees will be mitigated by the project owner by, if feasible on-site, planting of 15 saplings for every tree lost with the objective of having at least 5 mature trees established for every tree lost according to the requirements listed below AND

b. Either pay the Conservancy an additional fee to purchase, plant, maintain, and monitor 15 saplings on the HCP/NCCP Preserve System for every tree lost according to the requirements listed below, OR

c. The project owner will plant, maintain, and monitor 15 saplings for every tree lost at a site to be approved by the Conservancy (e.g., within an HCP/NCCP Preserve or existing open space linked to HCP/NCCP preserves).

2. The project owner shall meet all ECCC HCP/NCCP requirements for all planting options which include the following:

   a. Tree survival shall be monitored at least annually for 5 years, then every other year until year 12. All trees lost during the first 5 years will be replaced. Success will be reached at the end of 12 years if at least 5 trees per tree lost survive without supplemental irrigation or protection from herbivory. Trees must also survive for at least three years without irrigation.

   b. Native trees suitable for this site should be planted. When site conditions permit, a variety of native trees will be planted for each tree lost to provide trees with different growth rates, maturation, and life span, and to provide a variety of tree canopy structures for Swainson's hawk.

   c. Whenever feasible and when site conditions permit, trees should be planted in clumps together or with existing trees to provide larger areas of suitable nesting habitat and to create a natural buffer between nest trees and adjacent development (if plantings occur on the development site).

   d. Trees planted in the HCP/NCCP preserves or other approved offsite location will occur within the known range of Swainson's hawk in the inventory area and as close as possible to high quality foraging habitat.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures will be reported in the Monthly Compliance Reports by the Designated Biologist. If active nest trees are to be removed, a written report summarizing the results of the pre-construction survey shall be sent to the CPM, the East Contra Costa County Habitat Conservancy (Conservancy), CDFG, and USFWS no less than 15 days prior to the start of ground disturbance which will include documentation of any active nest trees to be removed. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed. Additional copies shall be provided to the Conservancy, CDFG, and USFWS. The report will include written verification that any compensation fees for of loss of nest trees have been paid to the Conservancy. Annual Reports will be submitted to the CPM and the Conservancy that document compliance with the ECCC HCP/NCCP requirements for planting and the success of any plantings. Additional copies shall be provided to CDFG and USFWS.

Burrowing Owl Impact Avoidance and Minimization Measures

BIO-12 The project owner shall implement the following measures to manage their construction site, and related facilities, in a manner to avoid or minimize impacts to breeding and foraging burrowing owls. These measures are subject to modification during ongoing coordination with the East Contra Costa County Habitat Conservancy (Conservancy).

1. The Designated Biologist or Biological Monitors or other agent approved by the CPM, in consultation with the East Contra Costa County Habitat Conservancy (Conservancy), CDFG, and USFWS, shall perform a pre-construction survey of suitable habitat at the project site and a 150-meter (approximately 500-foot) buffer from the perimeter of the proposed footprint (where possible and appropriate based on habitat) within 30 days prior to construction to identify burrowing owls and burrows. Surveys should take place near sunrise or sunset in accordance with CDFG survey guidelines (CBOC 1993). Breeding season surveys (February 1 to August 31) will document whether burrowing owls are nesting in or directly adjacent to disturbance areas. Non-breeding surveys (September 1 to January 31) will document whether burrowing owls are using habitat in or directly adjacent to any disturbance area. All potential burrows or burrowing owls will be mapped. If ground-disturbing activities are delayed or suspended for more than 30 days after the pre-construction survey, the site will be resurveyed. Survey results will only be valid for the season (breeding or non-breeding) during which the survey is conducted.

If burrowing owls are found onsite, the following shall be implemented:

1. During the breeding season (February 1 through August 31), all nest sites that could be disturbed by project construction shall be avoided during the remainder of the breeding season or while the nest is occupied by adults or young as determined by the Designated Biologist.

2. During the breeding season (February 1 through August 31), occupied burrows in designated construction areas or within 160 feet of designated construction areas shall not be disturbed unless a qualified biologist verifies through non-invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.

3. During the non-breeding season (September 1 to January 31), occupied burrows in designated construction areas or within 160 feet of designated construction areas shall not be disturbed, if possible.

4. If occupied burrows for burrowing owls are not avoided during the non-breeding season, owls should be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors should be in place for 48 hours prior to excavation. The project area should be monitored daily for 1 week to confirm that the owl has abandoned the burrow. Whenever possible,

burrows should be excavated using hand tools and refilled to prevent reoccupation (CDFG 1995). Plastic tubing or a similar structure should be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow.

Verification: All avoidance and minimization measures related to burrowing owl shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. The project owner shall submit a report to the CPM, the East Contra Costa County Habitat Conservancy (Conservancy), CDFG, and USFWS at least 10 days prior to ground disturbing activities or construction equipment staging that describes when surveys were completed, observations, and mitigation measures to be implemented. Within 30 days after completion of owl passive relocation and monitoring, and the start of ground disturbance, the project owner shall provide written verification to the CPM, the Conservancy, USFWS, and CDFG that burrowing owl mitigation measures have been completed.

American Badger Impact Avoidance and Minimization Measures

BIO-13 To avoid direct impacts to American badgers, pre-construction surveys shall be conducted concurrent with the San Joaquin kit fox and burrowing owl pre-construction surveys. Surveys shall be conducted as described below:

The Designated Biologist or Biological Monitors shall perform pre-construction surveys for badger dens in the project area, including areas within 250 feet of all project facilities, utility corridors, and access roads. If dens are detected each den shall be classified as inactive, potentially active, or definitely active. Den avoidance, monitoring, and destruction methods shall adhere to those impact avoidance and minimization measures prescribed for San Joaquin kit fox (see Condition of Certification **BIO-14**).

Verification: All avoidance and minimization measures related to American badger shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. The project owner shall submit a report to the CPM and CDFG at least 10 days prior to the start of any ground disturbing activities or construction equipment staging that describes when badger surveys were completed, observations, and mitigation measures to be implemented. Within 30 days after completion of construction the project owner shall provide to the CPM a written construction termination report identifying how impact minimization measures have been completed. Additional copies shall be provided to the Conservancy, CDFG, and USFWS.

San Joaquin Kit Fox Impact Avoidance and Minimization Measures

BIO-14 The following measures, developed in cooperation with East Contra Costa County Habitat Conservancy (Conservancy), shall be implemented to avoid and minimize impacts to San Joaquin kit fox. These measures are subject to modification during ongoing coordination with the Conservancy.

1. The Designated Biologist or Biological Monitors or other agent approved by the CPM, in consultation with CDFG and USFWS, shall perform pre-construction surveys in the project area, in all areas identified in the

Conservancy's Planning Survey Report as having suitable breeding or denning habitat, including areas within 250- foot-radius of all project facilities, utility corridors, and access roads within 30 days prior to construction to identify San Joaquin kit fox dens. Adjacent parcels under different land ownership shall not be surveyed. Surveys will be conducted in accordance with USFWS survey guidelines (USFWS 1999).

If San Joaquin kit fox and/or suitable dens are found onsite, the following shall be implemented:

Exclusion Zones

If dens are identified in the survey area outside of the proposed disturbance footprint exclusion zones around each den entrance or cluster of entrances will be demarcated. The configuration of exclusion zones around the kit fox dens should have a radius measured outward from the entrance or cluster of entrances. The following radii are minimums, and if they cannot be followed, the CPM, the Conservancy, USFWS, and CDFG must be contacted:

- Potential den: 50 feet
- Known den: 100 feet
- Natal/pupping den (occupied and unoccupied): the CPM, the Conservancy, USFWS, and CDFG must be contacted

Known den: To ensure protection, the exclusion zone should be demarcated by fencing or stakes and flagging that encircles each den at least 100 feet from den entrance and does not prevent access to the den by kit foxes. Exclusion zones shall be demarcated with stakes and flagging and should be maintained until all construction related or operational disturbances have been terminated. At that time, all fencing or stakes and flagging shall be removed to avoid attracting subsequent attention to the dens.

Potential den: Placement of 4-5 flagged stakes at least 50 feet from the den entrance(s).

Construction and other project activities should be prohibited within these exclusion zones.

Destruction of Dens

Disturbance to all San Joaquin kit fox dens should be avoided to the maximum extent possible. Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed.

Potential, Known, and/or Occupied kit fox dens shall not be destroyed unless the applicant has take authorization from the USFWS which would be provided through participation in the ECCC HCP/NCCP.

Potential, Known, and/or Occupied Dens: Known dens occurring within the footprint of the activity must be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If a natal or pupping den is detected in the survey area, the CPM, USFWS, and CDFG shall be notified immediately. The den shall not be excavated until the pups and adults have vacated and then only after further consultation with USFWS and CDFG.

If kit fox activity is observed at the den during this initial monitoring period, the den should be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity.

For dens other than natal or pupping dens, use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal 's normal foraging activities. . Energy Commission staff, USFWS, and CDFG encourage hand excavation, but realize that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.

Destruction of the den should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above should be resumed. Destruction of the den may be completed when in the judgment of the biologist the animal has escaped from the partially destroyed den.

If any den was considered unoccupied, but upon commencement of den destruction determined to be occupied, then destruction shall cease and the CPM, USFWS, and CDFG shall be notified immediately.

Verification: All avoidance and minimization measures related to San Joaquin kit fox shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. The pre-construction survey shall be conducted no more than 30 days prior to the initiation of construction on the OGS project site or sanitary sewer line and transmission line corridors. A written report summarizing the results of the pre-construction survey shall be sent to the CPM, the East Contra Costa County Habitat Conservancy (Conservancy), CDFG, and USFWS within 5 working days of survey completion and prior to the start of ground disturbance. Within 30 days after completion of construction the project owner shall provide to the CPM a written construction termination report

identifying how impact minimization measures have been completed. Additional copies shall be provided to the Conservancy, CDFG, and USFWS.

Western Pond Turtle Impact Avoidance and Minimization Measures

BIO-15 The following measures shall be implemented to avoid and minimize impacts to western pond turtle. These measures are subject to modification during ongoing coordination with the East Contra Costa County Habitat Conservancy (Conservancy).

1. Pre-construction surveys shall be conducted concurrent with the giant garter snake pre-construction surveys. Surveys shall be conducted as described below in condition of certification **BIO-16**

2. ESA fencing will be installed to protect the riparian habitat along East Antioch Creek in the vicinity of the intersection of the transmission line right-of-way as described under giant garter snake avoidance and minimization measures (see **BIO-16**).

Verification: All avoidance and minimization measures related to western pond turtle shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. The project owner shall submit a report to the CPM and CDFG at least 10 days prior to the start of any ground disturbing activities or construction equipment staging that describes when western pond turtle surveys were completed, observations, and mitigation measures to be implemented. Within 30 days after completion of construction the project owner shall provide to the CPM a written construction termination report identifying how impact minimization measures have been completed. Additional copies shall be provided to the East Contra Costa County Habitat Conservancy and CDFG.

Giant Garter Snake Impact Avoidance and Minimization Measures

BIO-16 The following measures, developed in cooperation with East Contra Costa County Habitat Conservancy (Conservancy) shall be implemented to avoid and minimize impacts to giant garter snake (GGS). These measures are subject to modification during ongoing coordination with the Conservancy.

1. The Designated Biologist or a representative approved by USFWS and the CPM shall perform pre-construction surveys in areas identified in the Conservancy's Planning Survey Report as having suitable GGS habitat and 200 feet of adjacent upland as measured from the outer edge of each bank. Surveys will document the extent of suitable habitat in the project area, including all project facilities, utility corridors, and access roads, and document any sighting of GGS.

2. Construction within 200 feet of aquatic features (East Antioch Creek) or within suitable GGS habitat must follow USFWS construction guidelines. The project applicant shall minimize all construction within 200 feet of aquatic features with suitable GGS habitat to the greatest extent possible. All construction that must occur within 200 feet of aquatic features with

potential GGS habitat shall occur within the GGS active period (May 1-October 1).

3. Wildlife exclusion fencing will be installed to protect the riparian habitat along East Antioch Creek in the vicinity of the intersection of the transmission line right-of-way.

4. USFWS shall approve in writing any construction work within GGS habitat that must be conducted outside of this time window (October 1 and April 30).

Verification: All GGS impact avoidance and minimization measures shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. The Designated Biologist or a representative approved by the CPM, in consultation with the East Contra Costa County Habitat Conservancy (Conservancy), CDFG, and USFWS, must survey the construction area within potential GGS habitat no more than 24 hours prior to the initiation of construction. Another pre-construction survey must be conducted if construction activity ceases for a period of more than 2 weeks. The project owner shall submit a report to the Conservancy, USFWS, CDFG, and the CPM documenting results of pre-construction surveys within 24 hours of commencement of construction activities. The project owner shall submit a report to the Conservancy, USFWS, CDFG, and the CPM if any GGS are found within work areas no more than 24 hours after the sighting is made. Within 30 days after completion of construction the project owner shall provide to the CPM a written construction termination report identifying how impact minimization measures have been completed. Additional copies shall be provided to the Conservancy, CDFG, and USFWS.

California Red-legged Frog Impact Avoidance and Minimization Measures

BIO-17 The following measures, developed in cooperation with East Contra Costa County Habitat Conservancy (Conservancy) shall be implemented to avoid and minimize impacts to California red-legged frog. These measures are subject to modification during ongoing coordination with the Conservancy.

1. Wildlife exclusion fencing will be installed to protect the riparian habitat along East Antioch Creek in the vicinity of the intersection of the transmission line right-of-way as described under giant garter snake avoidance and minimization measures.

2. A written notification of construction activities in the vicinity of East Antioch Creek shall be submitted to the CPM, CDFG, USFWS, and the Conservancy prior to the start of any ground disturbing activities or construction equipment staging.

Verification: All avoidance and minimization measures related to western pond turtle shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist. The project owner shall submit a written notification to the CPM, the East Contra Costa County Habitat Conservancy (Conservancy), CDFG, and USFWS no less

than 10 days prior to the start of any ground disturbing activities or construction equipment staging, that notifies the agencies of the initiation of construction and that wildlife exclusion fencing was installed to protect appropriate habitat. Within 30 days after completion of construction the project owner shall provide to the CPM a written construction termination report identifying how impact minimization measures have been completed. Additional copies shall be provided to the Conservancy, CDFG, and USFWS.

Wetland E Post-construction Management Plan

BIO-18 The project owner shall develop and implement a Wetland E Post-construction Management Plan (Plan). The plan must include monitoring methods, planting design, responsible parties, long-term management and maintenance requirements, contingency plan, and details on the funding source. The plan must be developed by the project owner in coordination with the CPM and CDFG. The Plan will include all proposed habitat improvements and enhancement goals, objectives and performance standards developed by the applicant in coordination with CDFG (CH2MHILL 2010k). Detailed baseline maps which show the current species composition or cover of wetland vegetation as well as current extent of noxious weed cover as determined by standard vegetation sampling methods will be included in the Plan. Sampling methods would also be fully described in the Plan.

For the CPM and CDFG to deem the enhancements successful:

1. The site will have 75 percent survivorship of planted coast live oak by year 5.
2. Surviving trees shall show leader growth for 2 out of the last 3 years of monitoring.
3. The site will have 75 percent survivorship of planted upland dune shrubs by year 5.
4. The native upland herbaceous species shall be established without reseeding for 2 out of the last 3 years of monitoring.
5. The site will not require watering or maintenance other than weed control after year 3.
6. The site shall not contain more than 5 percent invasive exotics (Cal-IPC rating High) after 5 years.

The project owner shall maintain wildlife habitat value and wildlife use of Wetland E.

For the CPM and CDFG to deem this successful:

1. There shall be no significant change in the duration or extent of wetland ponding compared to pre-project conditions.

2. There shall be no significant change in species composition or cover of wetland vegetation compared to pre-project conditions based upon standard vegetation sampling techniques.

3. Annual monitoring reports will be submitted to the CPM and CDFG for review and approvals for years 1, 2, 3, 4, and 5, with the first year beginning one year after the habitat improvements are implemented. Habitat improvements are to be implemented concurrently with initiation of the OGS project.

Verification: At least 60 days prior to the start of any construction-related ground disturbance the project owner shall submit to the CPM and CDFG a draft Wetland E Post-construction Management Plan. At least 30 days prior to the start of any construction-related ground disturbance, the project owner shall provide the CPM with the final version of the Wetland E Post-construction Management Plan that has been reviewed and approved by the CPM, in consultation with CDFG. All modifications to the Wetland E Post-construction Management Plan shall be made only after approval from the CPM.

Antioch Dunes National Wildlife Refuge Funding

BIO-19 The project owner shall provide an annual payment to Friends of San Pablo Bay to assist in noxious weed management of the Antioch Dunes National Wildlife Refuge. The first annual payment shall be no less than $5,000.78.

Each subsequent annual payment shall be adjusted for inflation in accordance with the Employment Cost Index – West or its successor, as reported by the U.S. Department of Labor's Bureau of Labor Statistics. Payment shall be made annually for the duration of project operation.

Verification: No later than 30 days following the start of project operation, the project owner shall provide written verification to the CPM, USFWS, and CDFG that the first-annual payment was made to the Friends of San Pablo Bay in accordance with this condition of certification. The project owner shall provide evidence that it has specified that its annual payment to Friends of San Pablo Bay can be used only to assist in noxious weed management at the Antioch Dunes National Wildlife Refuge.

Thereafter, within 30 days after each anniversary date of the commencement of project operation, the project owner shall provide written verification to the CPM, USFWS, and CDFG that payment has been made to the Friends of San Pablo Bay in accordance with this condition of certification. This verification shall be provided annually for the operating life of the project. The project owner also shall request an annual report from the Friends of San Pablo Bay documenting how each annual payment required hereunder was used and applied to assist in noxious weed management at the Antioch Dunes National Wildlife Refuge. The project owner shall provide copies of such reports to the CPM within thirty (30) days after receipt.

East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan Mitigation Fees

BIO-20 The project owner shall pay mitigation fees for temporary and permanent impacts based on the acres of impact (staff assumes a 1:1 mitigation ratio for temporary and permanent impacts) as a one-time development fee of $230,081.33 or updated fee as adjusted by the East Contra Costa County Habitat Conservancy (Conservancy), pending the approval date and the Annual Adjustment of mitigation fees.

Verification: A copy of the receipt of payment issued to East Contra Costa County Habitat Conservancy (Conservancy), verifying the funds have been paid, shall be provided to the CPM within 30 days prior to site or related facilities mobilization.

East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan Certificate of Inclusion

BIO-21 The project owner shall provide a copy of the final East Contra Costa County Habitat Conservation Plan /Natural Communities Conservation Plan (ECCC HCP/NCCP) Certificate of Inclusion (permit). The terms and conditions contained in the incidental take permit shall be incorporated into the project's BRMIMP and implemented.

Verification: Within 5 business days of its receipt, the project owner shall submit to the CPM a copy of the East Contra Costa County Habitat Conservancy's Certificate of Inclusion (permit) and verify that the permit terms and conditions are incorporated into the BRMIMP and will be implemented.

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LAND USE

Negar Vahidi and Susanne Huerta

SUMMARY OF CONCLUSIONS

Energy Commission staff concludes that the proposed Oakley Generating Station (OGS would be consistent with the applicable laws, ordinances, regulations, and standards (LORS) pertaining to State and local land use planning with implementation of Conditions of Certification **LAND-1** and **LAND-2**. In addition, the OGS would be compatible with existing on-site or nearby uses, as it is consistent with the general industrial character of these existing permitted uses, and the pattern of development in the project area. The cumulative implementation of the planned developments would result in the conversion of hundreds of acres of lands that are currently in agricultural production to urban land uses. However, project-related cumulative land use impacts would be less than significant.

INTRODUCTION

The land use analysis of the Oakley Generating Station Application for Certification (AFC) focuses on the project's consistency with land use plans, ordinances, regulations, and policies, and the project's compatibility with existing and planned land uses. In general, a power plant and its related facilities could be incompatible with surrounding land uses if they cause unmitigated impacts in the areas of noise, dust, public health, traffic, and visual resources. These individual resource areas are discussed in detail in separate sections of this document. A power plant also may create a significant land use impact if it converts prime or unique farmland or farmland of statewide importance to non-agricultural uses.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LAND USE Table 1 provides a general description of land use LORS applicable to the proposed project. The project's consistency with these LORS is discussed in **LAND USE Table 2**. The proposed project site, the construction laydown site, the three dirt stockpile areas, the sanitary sewer force main, and approximately one mile of the transmission line are located within the city of Oakley. The remaining 1.4 miles of the proposed transmission line is located within the city of Antioch.

The city of Oakley initially adopted Contra Costa County's general plan and zoning districts at the time of incorporation in 1999. In December 2002, the city adopted its own general plan and followed with the Oakley Municipal Code. The city's General Plan designates the entire DuPont property a redevelopment zone, but the site has not been formally rezoned from the previous Contra Costa County Heavy Industrial (HI) zoning designation. Oakley did update the zoning districts; however, the project site was not rezoned and retains the county's zoning district (referred to as a "carry-over" zone district). Therefore, applicable land use LORS for Contra Costa County, the city of Oakley, and the city of Antioch are presented in **LAND USE Table 1**.

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

Applicable LORS	Description
Federal	None
State	
Subdivision Map Act (Public Resources Code Section 66410-66499.58)	This section of the California Public Resources Code provides procedures and requirements regulating land division (subdivisions) and parcel legality. Regulation and control of the design and improvement of subdivisions have been vested in the legislative bodies of local agencies.
Local	
Contra Costa County Zoning Ordinance (Contra Costa Co. 2008)	The Contra Costa County zoning ordinance (Title 8 of the Contra Costa County Code) establishes zoning districts and contains regulations governing the use of land and improvement of real property within zoning districts. The Contra Costa Zoning Ordinance supports the implementation of the General Plan, and specifies what uses are permitted, conditionally permitted, or prohibited within each zone. In 1999, the city of Oakley became incorporated and retained the county's general plan and zoning designations. A general plan was then adopted in 2002, followed by a municipal code in 2006. However, some properties, including the proposed project site, retained the county's zoning designations. Therefore, this analysis includes proposed project's consistency with the county's applicable zoning ordinances.
City of Oakley 2020 General Plan (COO 2010a)	The City of Oakley's General Plan was originally adopted in 2002. The Contra Costa County General Plan assumed a planning horizon of 1995 – 2010 and addressed growth, development, housing, and recreational use within the Oakley community, as well as the lands that were unincorporated County lands at the time the County general plan was adopted. The primary function of the General Plan is to prescribe growth within the region in an orderly fashion and to allocate specific areas for development that will cause the least impact to the environment. On January 26, 2010, the city adopted an amended version of the plan.
City of Oakley Municipal Code; Title 9, Chapter 1 Zoning (COO 2010b)	The Zoning Ordinance is adopted to protect and promote public health, safety, peace, comfort, convenience, prosperity, and general welfare. In particular, the Zoning Ordinance provides a guide for the physical development of Oakley's General Plan Land Use Diagram, and fosters implementation of the goals and policies of the Oakley General Plan dealing with land use, urban design, environmental protection, and public health and safety.
City of Antioch General Plan (COA 2003)	The City of Antioch's General Plan contains policies pertaining to growth management, land use, community image and design, economic development, circulation, public services and facilities, housing, resource management and environmental hazards. Many of the policies are aimed at balancing housing and employment growth and enhancing the visual character and image of the community, anticipating significant future growth.

Applicable LORS	Description
City of Antioch Zoning Ordinance (COA 2009)	The city's zoning ordinance is part of the municipal code and implements the policies of the general plan. Title 9 of the city's municipal code is related to planning and zoning.

SETTING

PROPOSED PROJECT

For a detailed description of the proposed project components and associated facilities, see the **Project Description** section. The environmental setting for the proposed project as it relates to land use is described below.

Power Plant Site

The proposed project site is located in the city of Oakley, in eastern Contra Costa County, at 6000 Bridgehead Road, northeast of the junction of State Route 4 and State Route 160. The project would be located on a 21.95-acre site that is part of a larger 210-acre property owned by E.I. du Pont de Nemours and Company (Dupont). The applicant intends to record a lot line adjustment to create the separate 21.95-acre proposed project site should the Energy Commission approve the Application for Certification. The existing land use for the majority of the 21.95-acre project site is a vineyard, while a portion of the northwest end of the site is a wetland and a portion of the northeast end of the site was formerly used for industrial purposes, as it was formerly a part of the developed portion of the DuPont property.

The project is bounded to west by the PG&E Antioch Terminal, which is a large natural gas transmission hub, to the north by the industrial and/or vacant industrial portions of the DuPont property, to the east by DuPont's titanium dioxide landfill area, and to the south by the Atchison, Topeka and Santa Fe railroad right-of-way (also known as the Burlington Northern Santa Fe [BNSF]). South of the railroad is a 76.4-acre active vineyard, which is also in the process of redevelopment under the River Oaks Specific Plan (refer to the "Cumulative Impacts and Mitigation" subsection for details) (COO 2007).

The proposed project would include a new entrance lane from Bridgehead Road, just south of the intersection of Bridgehead Road and Wilbur Avenue. This would be the primary access point to the OGS.

Construction laydown and parking areas would be located on a 20-acre parcel east of the proposed project site boundary, but within the DuPont property. Primary access to the project site during construction would also be from Bridgehead Road.

Other Project-Related Features and Facilities

The OGS-related linear facilities would include connections to a transmission line,

potable water line, a sanitary sewer pipeline, and a natural gas supply. These linear facilities and other features/facilities that would be developed as part of the proposed project are listed below.

- A 230-kilovolt (kV) onsite switchyard;
- A 2.4-mile single-circuit, 230-kV transmission line that would connect the OGS with the PG&E Contra Costa Substation;
- A pull-and-tensioning site for the proposed transmission line located just west of Highway 160 in a vineyard (CH2M Hill 2010a);
- Direct connection to the PG&E natural gas terminal adjacent to the project site;
- Connection to an existing onsite potable water line;
- A 0.44 mile sanitary sewer force main that would connect to an existing sewer line located in Main Street (CH2M Hill 2010b);
- Three offsite dirt stockpile areas north of the project site; and
- A 20-acre construction laydown and parking area east of the project site.

Agricultural Land

The Farm Land Mapping and Monitoring Program (FMMP) of the California Department of Conservation (DOC) provides statistics on the conversion of farmland to non-agricultural uses for Contra Costa County. According to the FMMP "Important Farmlands" maps dated 2008, the majority of the proposed project site is located on land designated as "Farmland of Statewide Importance,"[1] with areas of "Urban and Built-Up Land."[2] (DOC 2008). Portions of the proposed 230-kV transmission line would traverse land designated as "Urban and Built-Up Land," "Other Land,"[3] and "Farmland of Statewide Importance." However, this transmission line would be constructed within an existing 80-foot-wide 60-kV transmission line right-of-way (ROW) owned by PG&E (CCGS 2009). In addition, a pull-and-tensioning site would be located just west of Highway 160 in a vineyard within the city of Antioch.

The proposed project and related facilities are not subject to an Agricultural Land Conservation (Williamson Act) contract or within agricultural zoning designations.

SURROUNDING AREA

The OGS site is surrounded by industrial and commercial uses to the north, west and east and agricultural uses to the south. Contra Costa Substation (CCS) is located approximately two miles west of the OGS project site. Land in the general vicinity of the

[1] Farmland of Statewide Importance is similar to prime farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

[2] Urban and Built-Up Land is occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. Common examples include residential, industrial, commercial, institutional facilities, and

[3] Other Land is not included in any other mapping category. Common examples include low density rural developments, riparian areas not suitable for livestock grazing, and vacant and nonagricultural land surrounded on all sides by urban development.

project site contains a mix of industrial and commercial uses, undeveloped land, open space, agriculture, recreation facilities and residential development. The nearest residences are approximately 900 feet southeast of the site boundary.

The BNSF railroad runs in an east-west direction and is adjacent to the southern boundary of the OGS site. State Route (SR) 160 is adjacent to the west boundary of the project site.

In addition to the land uses described above, several recreational, religious, educational, and natural resource protection areas are within one mile of the OGS site as follows:

- Almondridge City Park;
- Meadow Brook City Park;
- Unity In Antioch;
- Live Oaks Community Christian;
- Cornerstone Pentecostal Church;
- Bouton-Shaw Academy (Private 1-12);
- Heather Park;
- Orchard Park Elementary School;
- Bridgeway Preschool; and
- Calvary Chapel Antioch

GENERAL PLAN LAND USE AND ZONING DESIGNATIONS

The general plan land use and zoning designations for the proposed power plant site and project-related features are illustrated in AFC Figures 5.6-3 (General Plan Designations) and 5.6-4 (Zoning Designations), respectively. In addition, these figures illustrate the land use and zoning designations of lands within a one-mile buffer of the proposed power plant site and lands within a ¼ mile buffer of the proposed transmission line. The land use and zoning designations of the areas surrounding the proposed project do not directly apply to the proposed project, but are presented to help illustrate the affected local agencies' existing and planned pattern of land use development in the project area.

The OGS project site is currently in the city of Oakley and designated by the Oakley General Plan as Utility Energy (UE), and under the city's Zoning Ordinance, the UE district allows for power plant uses involved in the clean production of electricity utilizing the best available combustion turbine technology (COO 2010a, COO 2010b). In addition, the project site is within the Northwest Oakley Planning Area, which is intended for industrial and commercial development by the General Plan.

The city of Oakley's General Plan designates the entire DuPont property a redevelopment zone, but has not formally rezoned the DuPont property from the previous Contra Costa County Heavy Industrial (HI) zoning designation. The city of Oakley initially adopted the zoning districts of Contra Costa County at the time of

incorporation in 1999. In December 2002, the city adopted its own general plan and followed with the Oakley Municipal Code. Oakley did update the zoning districts; however, certain properties were not rezoned at that time. The DuPont property, which includes the project site, was one of the sites that was not rezoned and retains the zoning district from Contra Costa County (referred to as a "carry-over" zone district).

In addition, because the project site is within a city of Oakley redevelopment area, there is a pending specific plan with the proposed zoning for the entire DuPont property. According to the AFC (on page 5.6-16), "…the DuPont Specific Plan…, including the project site, is under preliminary review by the City of Oakley." In addition, AFC Section 5.6.1.5.1, states,

> *The plan calls for more than 200 acres of open space that includes wetlands along the San Joaquin River and trails to allow public access. To support new development, the plan also requires a complete upgrade of all site infrastructure including all utilities and roads. DuPont intends to select a master developer to build out a phased master plan for the property. The Western Development Area [where the proposed OGS is located] is Phase 1 of the master plan.*

According to the AFC, the city's zoning is (P-1 RA) "Redevelopment Agency Planned Development," which is based on the city's 2008 zoning map (AFC page 5.6-15). However, according to the city's updated 2009 zoning map, the current applicable zoning district for the project site is Specific Plan-3 (along with the three offsite dirt stockpile areas and construction laydown site) (COO 2009). The SP-3 zoning designation is still pending, and therefore, does not include a description of the zoning requirements. Future development on the project site would require a specific plan once the zoning is modified (AFC page 5.6-21). In addition, AFC page 5.6-23 states,

> *The city would require a rezone to a compatible Oakley zone district if an application for development was submitted prior to the citywide rezone. Based on a review of the Oakley zoning ordinance, the most compatible zone district for a power plant would be a UE district. The purpose and intent of the UE district is to allow clean production of electricity using combustion turbine technology, compatible with adjacent uses. A Conditional Use Permit is required for a power plant within this zone district. This district is, of course, consistent within the UE General Plan land use designation that currently applies to the project.*

According to the city of Oakley Municipal Code 9.1.604, Utility Energy District, all uses in the UE zoning district are conditioned uses, including "Gas-electric Power Plant" (full scale) (COO 2010b, COO 2010c).

Other Project-Related Features and Facilities

The proposed 230-kV transmission line is 2.4-miles long and would connect to the CCS located in the city of Antioch. Upon exiting the west side of the project site, one mile of the transmission line would alternate between land adjacent to State Route 160 (considered county land and within the Public/Semi-Public general plan designation) and land within the city of Oakley's Commercial general plan designation. Based on AFC Figure 5.6-4 (Zoning Designations), SR 160 is not within a county zoning

designation, and the city's zoning designations for the remaining portions of the transmission line are Light Industrial (L-I) and Retail Business (R-B).

Within the city of Antioch, 1.4 miles of the transmission line would traverse the following general plan designations: Medium Density Residential, Medium Low Density Residential, Open Space, and the SR-4/160 Frontage Focus Area. Zoning designations include the Service/Regional Commercial District (C-3), the Planned Development District (P-D), and the Light Industrial District (M-1).

As noted above, the construction laydown site and off-site dirt stockpile areas are within the P-1A zoning designation along with the proposed project site. However, the general plan designations for these facilities are as follows: the west side of the construction laydown site is within the city of Oakley's Utility Energy general plan designation and the east side is within the Light Industrial designation; and the dirt stockpile areas are predominantly within the city of Oakley's Business Park general plan designation with small areas on the west side of the sites within the county's Public/Semi-Public general plan designation.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Energy Commission staff has analyzed the information provided in the AFC and has acquired information from other sources, including local jurisdiction planning documents, to determine consistency of the proposed project with applicable land use LORS and the proposed project's potential to have significant adverse land use-related impacts.

METHOD AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Significance criteria used in this document are based on the CEQA Guidelines (CCR 2006) and performance standards or thresholds identified by Energy Commission staff, based on applicable LORS and utilized by other governmental regulatory agencies. An impact may be considered significant if the proposed project results in:

- Conversion of Farmland
  - Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.
  - Conflict with existing zoning for agricultural use or a Williamson Act contract.
  - Other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural uses.
- Physical disruption or division of an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction, or that would normally have jurisdiction, over the project. This includes, but is not limited to, a General Plan, redevelopment plan, or zoning ordinance.
- Individual environmental effects, which, when considered with other impacts from the same project or in conjunction with impacts from other closely related past,

present, and reasonably foreseeable future projects, are considerable, compound, or increase other environmental impacts.

In general, a power plant and its related facilities may also be incompatible with existing or planned land uses, resulting in potentially significant impacts, if: they create unmitigated noise, dust, or a public health or safety hazard or nuisance; result in adverse traffic or visual impacts; or preclude, interfere with, or unduly restrict existing or future uses. Please see other sections of this document, as noted, for a detailed discussion of any additional potential project impacts and recommended mitigation and conditions of certification.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Conversion of Farmland

According to the FMMP, the proposed project, including its associated linear facilities, are all located on lands designated as “Farmland of Statewide Importance,” “Urban and Built-Up Land,” and “Other Land.”

As described in detail in the “**Agricultural Land**” subsection above, under the standard FMMP mapping criteria, the project site is designated as Farmland of Statewide Importance (DOC 2008).

Under certain circumstances, the conversion of 21.95 acres of Farmland of Statewide Importance would result in a significant impact. However, Cline Cellars, Inc. (Cline), has managed approximately 13 acres of vineyards on the proposed project site for twenty-five years (Cline 2010); and in a letter to the Energy Commission, Cline states that, “…[t]hese grapes have a very low yield and… due to its size, the low yields and proximity to industrial development, we do not consider this property to have great agricultural potential and it should not be treated as prime farmland” (Cline 2010).

In addition, although the project site is designated as Farmland of Statewide Importance, the site is small and predominantly surrounded by non-agricultural land uses, including the DuPont site with existing industrial development and vacant land to the north and east, the PG&E Antioch Terminal (a natural gas transmission hub) to the west, and the BNSF railroad along the southern boundary of the project site. Therefore, the conversion of the project site would not result in a significant loss of agricultural land.

The project site is not located in an area that is under a Williamson Act contract. Therefore, the proposed project would not result in the conversion of Farmland to non-agricultural use, or conflict with existing agricultural zoning or Williamson Act contracts.

Construction of the proposed transmission line would require a pull-and-tensioning site, which would be located in a vineyard just west of Highway 160 (CH2M Hill 2010a). Based on the description of the location and AFC Figure 5.6-2 (Important Farmland Within Project Area), it appears the pull-and-tensioning site would be located within land designated as Farmland of Statewide Importance. Since this would be a construction site, impacts to agricultural land would be temporary and would not result in any

permanent conversion of existing Farmland. Therefore, this impact would be less than significant.

Physical Disruption or Division of an Existing Community

The proposed project would be located entirely on private property and completely surrounded by industrial development. Land in the general vicinity of the project site contains a mix of industrial and commercial uses, undeveloped land, open space, agriculture, recreation facilities and residential development. The nearest residences are approximately 900 feet southeast of the site boundary. Access to the proposed project (including the construction laydown/worker parking area) would be through existing road ROW, including Bridgehead Road and Wilbur Avenue.

The offsite portions of the proposed transmission line would be constructed within an existing transmission line ROW; and the sanitary sewer force main would extend 0.33 south from the project site within the public ROW of Bridgehead Road to Main Street, it would then turn eastward for 0.11 mile and connect to an existing sewer line. After construction of the sewer line, the pavement in Bridgehead Road and Main Street would be restored (CH2M Hill 2010b). Therefore, no existing roadways or pathways would be completely blocked or removed from service due to the proposed OGS. For a discussion of impacts to traffic access, please refer to the **Traffic and Transportation** section.

The proposed project would not disrupt or divide an established community[4], nor would it conflict with the established industrial and power generation-related uses located immediately adjacent to the project site. Therefore, no significant impacts associated with disruption or division of an established community would occur as a result of the proposed project.

Conflict with Any Applicable Land Use Plan, Policy, or Regulation

As required by California Code of Regulations, Title 20, Section 1744, Energy Commission staff evaluates the information provided by the project owner in the AFC (and any amendments), project design and operational components, and siting to determine if elements of the proposed project would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, or that would normally have jurisdiction over the project except for the Energy Commission's exclusive authority (PRC 2005). This includes all applicable federal, state, and local laws, ordinances, regulations, and standards. From a CEQA perspective, the analysis places particular emphasis on any environmental effect that may be avoided or mitigated by conformity with the applicable LORS.

As part of the licensing process, the Energy Commission must determine whether a proposed facility complies with all applicable state, regional, and local LORS (Public Resources Code section 25523[d][1]). The Energy Commission must either find that a project conforms to all applicable LORS or make specific findings that a project's approval is justified even where the project is not in conformity with all applicable LORS (Public Resources Code section 25525).

[4] An established community usually refers to a residential community.

When determining LORS compliance, staff is permitted to rely on a local agency's assessment of whether a proposed project is consistent with that agency's zoning and general plan. On past projects, staff has requested that the affected local agency provide a discussion of the findings and conditions that the agency would make when determining whether a proposed project would comply with that agency's LORS, were they the permitting authority. Any conditions recommended by an agency are considered by Energy Commission staff for inclusion in the proposed conditions of certification for the project.

As part of staff's analysis of local LORS compliance, and specifically to determine the views of the city of Oakley on the project's consistency with their General Plan and zoning codes, staff sent a letter to the city of Oakley in November 2009. The letter was sent to the city's community development department, and requested the city to provide the conditional use permit (CUP) findings it would make for the OGS, and the conditions that they would attach to the proposed project, were they the permitting agency if not for the exclusive siting authority of the Energy Commission. On April 5, 2010, the city of Oakley responded to this request (COO 2010c) with a list of the city's CUP findings for the OGS as follows:

1. That the site for the proposed use is adequate in size and shape to accommodate the use and all yards, spaces, walls and fences, parking, loading, landscaping and other features required by law to adapt the use with land and uses in the neighborhood;

2. That the site for the proposed use relates to streets and highways adequate in width and pavement type to carry the quantity and kind of traffic generated by the proposed use;

3. The proposed use will be arranged, designed, constructed, operated and maintained so as to be compatible with the intended character of the area and shall not change the essential character of the area from that intended by the general plan and the applicable zoning ordinances;

4. That the proposed use provides for the continued growth and orderly development of the community and is consistent with the various elements and objectives of the general plan; and

5. That the proposed use, including any conditions attached thereto, will be established in compliance with the applicable provisions of the California Environmental Quality Act.

The city of Oakley's April 5 2010 letter provides the city's response to the California Energy Commission's Request for Agency Participation in the Review of the Contra Costa Generating Station Project (09-AFC-04). Attachment 1 of this letter provides the city of Oakley Comments and Recommendations on the Oakley Generating Station Project.

Attachment 1 requests that the applicant pay a General Plan Fee as adopted by Resolution No. 53-03, which is intended to ensure that "…developers and property owners should pay for all costs incurred by the city related to development or exercise of entitlements…" (COO 2003).

After review of these documents, staff has determined that the General Plan Fee (adopted by city of Oakley Resolution No. 53-03) is not a LORS that is applicable to the proposed project because of the Energy Commission's exclusive authority to license power plants over 50 megawatts. Specifically, Warren-Alquist Act § 25500 states:

> *In accordance with the provisions of this division, the [energy] commission shall have the exclusive power to certify all sites and related facilities in the state, whether a new site and related facility or a change or addition to an existing facility. The issuance of a certificate by the commission shall be in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law, for such use of the site and related facilities, and shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law.*

According to the city of Oakley, the city's General Plan designates the project site for a land use of Utility Energy, which "[a]llows for power plant uses involved in the clean production of electricity utilizing the best available combustion turbine technology"(COO 2010c). The project parcel is currently zoned SP-3 (future Specific Plan). However, the city has not yet approved a specific plan for the parcel, therefore, the underlying applicable zoning designation would be Heavy Industry (H-I). This zoning is compatible with power plant development. A rezone and a revision to the DuPont Specific Plan would not be required with Energy Commission certification (COO 2010c).

The development of the OGS project is consistent with the overall goals and policies of the city's General Plan. The project would site new industrial growth within an existing industrial area that is planned for future industrial growth as discussed in the Northwest Oakley Planning Area. The city's General Plan goals and policies are also consistent with the city of Antioch's goals and policies which support and encourage industrial development in this area, including the Eastern Waterfront Employment Focus Area and the SR4 Industrial Frontage Focus Area.

AFC Figure 5.6-4 shows the existing zoning as "Redevelopment Agency Planned Development" (P-1 RA) within the city of Oakley (CCGS 2009). However, as noted above and based on the updated 2009 Zoning Map, the current pending zoning is SP-3 (future Specific Plan) (COO 2010b, COO 2009). Nonetheless, the city's zoning designation for the project site is pending; therefore, the county's Heavy Industrial (H-I) zoning is still applicable, which is a "carry-over" zone from the Contra Costa County zoning ordinance. Therefore, this LORS analysis has also considered the county and the city's zoning designations.

The county's H-I District permits heavy industrial manufacturing uses of all kinds (Contra Costa Co. 2008). The OGS is a natural gas-fired power plant proposed to be sited on a site that is currently in use for agriculture, but is a part of an existing industrial development. Therefore, the processing of gas would be consistent with the heavy

industrial land use types allowed in the county H-I (Heavy Industrial) District, such as the existing Contra Costa Power Plant which is also within the county's H-I District.

Staff recommends implementation of Condition of Certification **LAND-2** to ensure that the proposed project is consistent with the city's conditional use permit (CUP) requirements, as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code, and city's Findings regarding the OGS. However, the city's recommendations pertain to numerous issue areas. Therefore, please refer to other sections of this Preliminary Staff Assessment for the project's compliance with the city's conditions applicable to resource areas other than land use.

The proposed transmission line would traverse approximately 1.4 miles of land in the city of Antioch within an existing transmission line ROW. The surrounding area consists of open space, commercial, and residential development. The transmission line would be consistent with the city of Antioch's General Plan since it would be sited within an existing transmission line ROW and any associated impacts would be temporary. Therefore, upon completion of construction, the transmission line would not result in any LORS inconsistencies.

LAND USE Table 2 provides the consistency of the proposed OGS with the specific applicable land use LORS adopted by State and local agencies, as identified in **LAND USE Table 1**. Staff has determined that the proposed project would comply with applicable land use LORS with implementation of Conditions of Certification **LAND-1** and **LAND-2**.

LAND USE Table 2
Project Compliance with Applicable Federal, State, and Local Land Use LORS

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
Federal	None		
State			
Subdivision Map Act (Pub. Resources Code Section 66410-66499.58)	The Subdivision Map Act provides procedures and requirements regulating land divisions and the determination of parcel legality. Regulation and control of the design and improvement of subdivisions by the Map Act have been vested in the legislative bodies of local government. Section 66412.1 of the Subdivision Map Act exempts a project from state subdivision requirements provided that the project demonstrates compliance with local ordinances regulating design and improvements.	YES with implementation of Condition of Certification **LAND-1**	According to the applicant, the OGS project site, excluding linear facilities and construction laydown areas, is proposed to be located on a portion of what would be a single legal parcel in the city of Oakley. The owner, DuPont, intends to record a lot line adjustment to create the project site and two neighboring parcels. The lot line adjustment would ensure that the OGS would be sited on a single legal parcel, should the Energy Commission approve the Application for Certification (AFC). As discussed in Appendix 1A of the AFC, and as of the writing of this Preliminary Staff Assessment, the lot line adjustment to create the 21.95-acre proposed project site has not been recorded yet. The current parcel configuration is a 210-acre parcel. The proposed 210-acre parcel is proposed for adjustment to create the 21.95-acre OGS project site (parcel "A"), a separate 8.06-acre lot (Parcel "B"), a 16.35-acre lot (Parcel "C"), and a 163-93-acre remainder lot (CCGS 2009). Because the lot line adjustment for the proposed project site has not yet been recorded, staff has incorporated Condition of Certification **LAND-1** to ensure that the proposed project would be sited on one legal parcel prior to the start of construction.
Local			
Contra Costa Code, Title 8 (Zoning) - Chapter 84-62: H-I, Heavy Industrial District (Contra Costa Co. 2008)	Article 84-62.4. Uses: *84-62.402 Uses--Permitted.* Heavy industrial manufacturing uses of all kinds, including, but not limited to, the manufacturing or processing of petroleum, lumber, steel, chemicals, explosives, fertilizers, gas, rubber, paper, cement, sugar, and all other industrial or manufacturing products	YES	AFC Figure 5.6-4 shows the existing zoning as Redevelopment Agency Planned Development (P-1 RA) within the city of Oakley (CCGS 2009). However, based on a letter from the city and the updated 2009 Zoning Map, the current zoning is SP-3 (future Specific Plan) (COO 2010b, COO 2009). Nonetheless, the city's zoning designation for the project site is pending; therefore, the county's Heavy Industrial zoning is still applicable, which is a "carry-over" zone from the Contra Costa County Zoning Ordinance. Therefore, this LORS analysis has also considered the

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	shall be permitted in the H-I district. (Ord. 1459: prior code § 8164(b): Ord. 1046: Ord. 382). *84-62.404 Uses--Requiring land use permit.* Uses requiring land use permit in the H-I district shall be the same as the uses designated in Section 84-58.404 for the L-I district.[5] (Ord. 67-39 § 5, 1967: Ord. 1459: prior code § 8164(a): Ords. 1046, 382). *Article 84-62.6. Lot, Height, Yard 84-62.602 Lot, height, yard--Regulations.* There are no lot area, height, or side yard regulations or limitations in the H-I district. (Ord. 1459: prior code § 8164(c): Ord. 1046: Ord. 382).		county and the city's zoning designations. The OGS is a natural gas-fired power plant proposed to be developed on a site that is currently in used for agriculture, but is a part of an existing industrial development. Therefore, the processing of gas would be consistent with the heavy industrial land use types allowed in the county H-I (Heavy Industrial) District[6].
City of Oakley 2020 General Plan: Chapter 2 - Land Use Element (Oakley 2010a)	General Land Use Policy 2.1.4 Promote the placement of the most intensive non-residential development (Commercial, Business Park and Light Industrial) in the Northwest Oakley Planning Area as defined in Figure 2-3.	YES	The proposed industrial project would be located in the Northwest Oakley Planning Area and is consistent with this policy.
	Policy 2.1.8 Discourage development that results in land use incompatibility. Specifically, require buffers between uses where appropriate and discourage locating sensitive uses (residential) adjacent to existing potentially objectionable uses or locating potentially objectionable uses adjacent to sensitive uses.	YES	The proposed project site is surrounded by industrial development. Other nearby land uses include commercial and agricultural development. There are no residential developments adjacent to the project site, and the closest residence is 900 feet southeast of project site boundary. Therefore, the proposed project is consistent with this policy.
	INDUSTRIAL Goal 2.4 Promote economic growth within the City of Oakley to ensure	YES	The OGS would expand the existing industrial development in the Northwest Oakley Planning Area, therefore providing additional employment. The proposed project is consistent

[5] *84-58.404 Uses--Requiring land use permit […in Light Industrial District].* All of the uses in the following districts are permitted after the granting of land use permits: Single family residential districts, multiple family residential districts, retail business districts, neighborhood business districts, general commercial districts, agricultural districts and forestry recreation districts. (Ord. 67-39 § 4, 1967: prior code § 8163(a): Ord. 1046: Ord. 1006: Ord. 382).

[6] For example, the Contra Costa Power Plant is located in unincorporated Contra Costa County and is within the HI zoning district.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	employment opportunities and goods and services are available within the community.		with this goal.
	Policy 2.4.1 The City of Oakley does not support or accommodate general Heavy Industrial uses. The City does allow and encourage Light Industrial and Utility Energy uses in appropriate locations.	YES	The proposed project is a utility energy development, and the project site is within the Northwest Oakley Planning which is intended for industrial development by the city's General Plan. There are no residential developments adjacent to the project site, and the closest residence is 900 feet southeast of project site boundary. In addition, the southern boundary of the site would be adjacent to a railroad ROW, which would create a buffer between the proposed project and the agricultural activities south of the site. Therefore, the proposed project would be compatible with existing land uses and is consistent with these policies.
	Policy 2.4.2 Avoid development which results in land use incompatibility. Specifically, avoid locating objectionable land uses within residential neighborhoods and protect areas designated for existing and future industrial uses from encroachment by sensitive (residential) uses.		
	Policy 2.4.3 Ensure there is adequate land available to accommodate industrial development.		
	Policy 2.4.4 Incorporate design buffers between potentially incompatible land uses and avoid, to the extent feasible, new land uses that compromise existing businesses and operations.		
	(UE) Utility Energy The Utility Energy designation allows for power plant uses involved in the clean production of electricity utilizing the best available combustion turbine technology. The structures associated with this land use designation shall be aesthetically designed, including landscape buffers, and produce no significant adverse affects, including excess noise, dust, and glare on surrounding land uses.	YES with implementation of Condition of Certification **LAND-2**	According to the city of Oakley, Municipal Code 9.1.604, Utility Energy District, states all uses in the UE zoning district are conditioned uses, including "Gas-electric Power Plant." As such, staff has recommended implementation of Condition of Certification **LAND-2** to ensure that the proposed project is consistent with the city's CUP requirements to the extent possible, as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
	Northwest Oakley Planning Area (summarized) The Northwest Oakley Special Planning Area encompasses approximately 972	YES	The proposed project site is within the Northwest Oakley Planning which is intended for industrial and commercial development by the city's General Plan. As a utility energy development, the proposed project would be consistent with

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	acres of land located generally north of existing Oakley Road and generally bounded by Big Break Road to the east, Highway 160 to the west and the Delta along the north. This Area has historically been dominated by the former DuPont facility to the north and other uses of industrial character along Highway 4/Main Street. The BNSF Railroad bisects this Area… *Development Vision* The City envisions this Area as the primary employment center within Oakley. The existing uses along Highway 4/Main Street are designated for commercial uses. Land north of the BNSF Railroad is designated as Business Park, Utility Energy and Light Industrial. Development within the Business Park designation is anticipated to be of a campus character, providing attractive architecture within a landscaped setting… Light Industrial uses will be required to maintain development standards that will contribute to the success of the areas designated as Business Park.		the purpose and intent of this planning area.
City of Oakley Zoning Ordinance	**Specific Plan-3 (SP-3)** SP-3 (future Specific Plan) is pending; therefore, the county's Heavy Industrial (H-I) zoning is still applicable, which is a "carry-over" zone from the Contra Costa County zoning ordinance (COO 2010c). The city's General Plan designation is Utility Energy which states all uses in the UE district are conditioned uses. Therefore, Staff recommends implementation of Condition of Certification **LAND-1** to ensure that the proposed project is consistent with the	YES with implementation of Condition of Certification **LAND-2**	According to the AFC, the city's zoning is (P-1 RA) Redevelopment Agency Planned Development, which is based on the city's 2008 zoning map (AFC page 5.6-15). However, according to the city's updated 2009 zoning map, the current applicable zoning district for the project site, the dirt stockpile areas and the construction laydown site is Specific Plan-3 (COO 2009). The SP-3 zone is pending, and therefore, does not include a description of the zoning requirements. As such, based on a the city's correspondence regarding the proposed project, staff has used the requirements set forth by the Utility Energy general plan designation which states all uses in the UE zoning district are conditioned uses. Therefore, staff recommends implementation of Condition of Certification

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	city's conditional use permit (CUP) requirements, as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.		**LAND-2** to ensure that the proposed project is consistent with the city's CUP requirements, as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
	Article 16 Administration **9.1.1602 Variance and Conditional Use Permit** f. Conditional Use Permit Standards. An application for a conditional use permit is an application to establish a land use within a land use district that does not allow establishment by right, but does allow the granting of a land use permit after a public hearing. The commission, in approval or conditionally approving a conditional use permit, shall find as follows: 1. That the site for the proposed use is adequate in size and shape to accommodate the use and all yards, spaces, walls and fences, parking, loading, landscaping and other features required by this title to adapt the use with land and uses in the neighborhood; 2. That the site for the proposed use relates to streets and highways adequate in width and pavement type to carry the quantity and kind of traffic generated by the proposed use; 3. The proposed use will be arranged, designed, constructed, operated and maintained so as to be compatible with the intended character of the area and shall not change the essential character of the area from that intended by the general plan and the applicable zoning ordinances; 4. That the proposed use provides for	YES with implementation of Condition of Certification **LAND-2**	According to a letter from the city, the proposed project would comply with the CUP Standards under Article 16. However, the city also provided Recommended Conditions of Approval that would be imposed if the project was being permitted by the city, but for the Energy Commission's exclusive authority to license power plants over 50 megawatts. The recommended conditions are related to site layout, design and landscaping, transportation and circulations improvements, conditions related to construction, operation and maintenance of the project, and conditions intended to mitigate the project's potential environmental impacts (COO 2010b). Given the exclusive authority of the Energy Commission to license the project, staff has recommended implementation of Condition of Certification **LAND-2** to ensure that the development of the proposed project is done in close coordination with the city of Oakley and consistent with the city's CUP requirements (to the extent possible) as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code. .

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	the continued growth and orderly development of the community and is consistent with the various elements and objectives of the general plan; 5. That the proposed use, including any conditions attached thereto, will be established in compliance with the applicable provisions of the California Environmental Quality Act.		
City of Antioch General Plan (COA 2003):	4.4.1 Land Use Designations **Medium Low Density.** These areas are generally characterized by single-family homes in typical subdivision development, as well as other detached housing such as zero lot line units and patio homes. Duplex development would generally fall into this development density. Areas designated Medium Low Density are typically located on level terrain with no or relatively few geological or environmental constraints. Older subdivisions within the northern portion of Antioch reflect this residential density. **Medium Density Residential.** A wide range of living accommodations, including conventional single-family dwellings, small lot single-family detached dwellings, mobile homes, townhouses, and garden apartments, characterizes the Medium Density land use designation. Development in these areas can be expected to be a maximum of two (2) stories, and include generous amounts of public or open space for active and passive recreational uses. Lands adjacent to parks, commercial uses, transit routes and rail stations, and arterial roadways would be appropriate for the upper end	YES	The proposed transmission line would traverse approximately 1.4 miles of land in the city of Antioch within an existing transmission line ROW. The surrounding area consists of open space, commercial, and residential development. Staff concludes that the transmission line would be consistent with the city of Antioch's General Plan since it would be sited within an existing transmission line ROW and any associated construction-related impacts would be temporary. Therefore, upon completion of construction, the transmission line would not result in any LORS inconsistencies.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	of the allowable development intensity for this category. Other lands would serve as a buffer or transition between lower density residential areas and higher density residential and commercial areas, as well as areas exhibiting greater traffic and noise levels. **Open Space.** These land uses are of a basically open space nature, and include parks, as well as other open space areas. Certain open space areas, such as those that exist to protect sensitive environmental resources, might not be open to public use, while other lands may be owned and managed by private entities, and therefore not open to the general public. The most prevalent public open space uses are City and regional parks, as well as private open space areas within residential developments. It is intended that this designation be applied only to lands owned by public agencies or which are already programmed for acquisition.		
	4.3.2 Community Structure Policies. *Policy b:* Give priority to new development utilizing existing and financially committed infrastructure systems over development needing financing and construction of new infrastructure systems. *Policy d:* Concentrate large-scale industrial uses along the waterfront east of Rodgers Point and within areas designated for industrial use along existing rail lines. Limit employment-generating uses adjacent to residential areas and within mixed-use planned	YES	Consistent with Policy b, the OGS project (associated features) would redevelop a portion of an existing industrial site within an industrial area. This redevelopment takes advantage of existing and nearby infrastructure (i.e., water and electric and gas transmission lines, major transportation corridors, rail facilities). In addition, consistent with Policy d, the OGS project would expand the existing industrial development along Wilbur Road, providing additional employment. Therefore, the proposed project is consistent with the city's applicable Community Structure Policies.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	communities to business parks and office uses.		
	4.4.4.2 Employment-Generating Land Use Policies. *Policy d:* Ensure appropriate separation and buffering of manufacturing and industrial uses from residential land uses.	YES	The proposed transmission line would traverse approximately 1.4 miles of land in the city of Antioch within an existing transmission line ROW. The surrounding area consists of open space, commercial, and residential development. Staff concludes that the transmission line would be consistent with the city of Antioch's General Plan since it would be sited within an existing transmission line ROW and any associated construction-related impacts would be temporary. Therefore, upon completion of construction, the transmission line would not result in any LORS inconsistencies.
	4.4.6.4 SR-4/160 Frontage. This Focus Area encompasses 428.45 acres along SR-4 and 160 freeways. The area is primarily undeveloped, with a large PG&E substation, a small commercial area, and a park and ride lot located along Hillcrest Avenue at the western portion of the Focus Area. **b. Policy Direction.** The design and function of the SR-4/160 Frontage Focus Area will be based on transit-oriented development principles. A mix of office, business park, light industrial uses, none of which rely on intensive use of heavy trucks, will be located within waling distance of high density housing, retail commercial, and the rail transit station and parking areas serving the station.		
City of Antioch Municipal Code, Title 9: Planning and Zoning (COA 2009) Chapter 5 – Zoning: Article 38, Land Use Regulations	Article 3 § 9-5.30 **(l) C-3 Regional Commercial District.** This district provides for retail and service commercial uses of a regional nature, including those in and adjacent to large centers with one or more full-time department stores with a typical minimum of 75,000 square feet of floor area. Regional commercial uses typically serve a population residing within an eight to 20-mile radius and occupy 30 to 50 acres or more. This district also provides for highway or	YES	The proposed transmission line would traverse approximately 1.4 miles of land in the city of Antioch within an existing transmission line ROW. The surrounding area consists of open space, commercial, and residential development. Staff concludes that the transmission line would be consistent with these zoning districts since it would be sited within an existing transmission line ROW and any associated construction-related impacts would be temporary. Therefore, upon completion of construction, the transmission line would not result in any LORS inconsistencies.

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	travel-oriented functions along freeways, major thoroughfares, and major roadways. This district is consistent with the Regional Commercial, and Transit-Oriented Development General Plan Designations, as well as with Somersville Road Corridor Focused Planning Area and other Focused Planning Areas permitting the types of commercial uses intended for this district.		
	(J) M-1 Light Industrial District. This district allows light industrial uses and excludes those heavy industrial uses with potentially hazardous or negative effects. This district is consistent with the Business Park, Light Industrial, and Rail-Served Industrial General Plan Designations, as well as with the Eastern Waterfront, SR-4/SR-160 Business Park, and East Lone Tree Focused Planning Areas. Uses include the fabrication, assembly, processing, treatment, or packaging of finished parts or products from previously prepared materials typically within an enclosed building.		
	<u>Article 23: Planned Development District</u> Planned Development Districts are intended to accommodate a wide range of residential, commercial and industrial land uses which are mutually supportive and compatible with existing and proposed development on surrounding properties. § 9-5.2304 USES PERMITTED. Any and all uses otherwise permitted in the city may be included in a P-D		

Applicable LORS	Description of Applicable LORS	Consistent?	Basis for Consistency
	District, provided such uses are shown on the approved final development plan for that district and are in accordance with the General Plan and any applicable Specific Plan.		

Land Use Compatibility

Land use compatibility refers to the physical compatibility of planned and existing land uses. Administrative or conditional use permitting requirements (see discussion in **LAND USE Table 2**) and project reviews under CEQA are in place to evaluate the compatibility of projects that are not a permitted use or that have elements that may adversely impact public safety, the environment, or that could interfere with or unduly restrict existing and/or future permitted uses. As noted in the discussions above under the section entitled **Physical Disruption or Division of an Established Community** and in **LAND USE Table 2**, development of the proposed project and its associated features/facilities are compatible with existing surrounding land uses, because the proposed project site, the dirt stockpile areas, and the construction laydown area are located entirely within the DuPont site, which was a major chemical manufacturing facility and was remediated in compliance with Department of Toxic Substances Control requirements. The site is currently occupied by industrial development and vacant land. In addition, the proposed 21.95-acre OGS site is adjacent to major transportation corridors (i.e., SR 4, SR 160, and the BNSF railroad). The proposed OGS is consistent with applicable LORS, such as existing and expected (i.e., city of Oakley) General Plan Land Use and Zoning designations for the proposed project site and the immediately surrounding existing land uses. Therefore, the proposed project would not result in any physical land use incompatibilities with existing surrounding land uses.

Sensitive Receptors

A proposed siting location may be considered inappropriate if a new source of pollution or hazard is located within close proximity to a sensitive receptor. From a land use perspective, sensitive receptor sites are those locations where people who would be more adversely affected by pollutants, toxins, noise, dust, or other project-related consequence or activity are likely to live or gather. Children, those who are ill or immune-compromised, and the elderly are generally considered more at risk from environmental pollutants. Therefore, schools, along with day-care facilities, hospitals, nursing homes, and residential areas, are considered to be sensitive receptor sites for the purposes of determining a potentially significant environmental impact. Depending on the applicable code, close proximity is defined as “within 1000 feet” of a school (California Health & Safety Code §§42301.6–9) or within 0.25 mile of a sensitive receptor, under CEQA (CCR 2006; CCR 2008). Proximity is not necessarily the deciding factor for a potentially significant impact, but is the threshold generally used to require further evaluation.

The area immediately surrounding the proposed project includes uses primarily associated with industrial uses and public utilities. There are sensitive receptors (such as recreational facilities, schools, churches, etc) within a one-mile buffer of the proposed OGS. However, none of these sensitive receptors are in close proximity of the proposed project site. The nearest residence is 900 feet southeast of the project site and the nearest residential neighborhood is approximately 4,000 feet east of the site boundary.

Given the existing permitted uses surrounding the proposed project, and the fact that the proposed project and its associated features/facilities are consistent with local LORS (which are developed by local jurisdictions to mitigate impacts of planned

development), the proposed project is not considered an incompatible land use with the surrounding and nearby uses, including sensitive receptors.

The **Air Quality**, **Hazardous Materials Management**, **Noise**, **Public Health**, **Traffic and Transportation**, and **Visual Resources** sections provide detailed analyses of the project-related nuisance impacts such as any adverse construction-generated noise, dust, and traffic; and operation-related public health, visual, and traffic impacts. These other sections of the preliminary staff assessment have analyzed the project for potential adverse impacts to sensitive receptors and have concluded there are no significant adverse impacts to sensitive receptors in their respective areas. Cumulative impacts and mitigation

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (CCR 2006, §15065[A][3]).

The area in the immediate vicinity of the proposed OGS site consists of similar industrial and utility development, as well as areas of commercial and agricultural development. Areas south of the OGS site have new and growing residential developments and, the following projects are pending: the River Oaks Crossing Specific Plan, the DuPont Specific Plan, the Eastern Waterfront Employment Focus Area, the SR4 Industrial Frontage. According to the AFC (pg. 5.6-27), these projects would contribute to the loss of land currently used as vineyards (CCGS 2009). Implementation of the Rivers Oaks Crossing Specific Plan would result in the conversion of 76.4 acres of land currently used for vineyards, and implementation of the redevelopment plans within the Eastern Waterfront Focus Area would result in the conversion of approximately 136 acres of land currently in use for agriculture (COO 2007). Although these proposed plans would result in the conversion of land currently in use for agriculture, the impact would not be cumulatively considerable since the acreage of the conversions are small, the areas have low agricultural yields (refer to the “Conversion of Farmland” subsection), and the prevalence of industrial and commercial development.

In addition, the Marsh Landing Generating Station and the Willow Pass Generating Station are proposed power plants that would be located west of the proposed project site at the existing Contra Costa (in unincorporated Contra Costa County) and Pittsburg Power Plants (in city of Pittsburg), respectively. Both of these projects are consistent with the general industrial character of the existing on-site permitted uses and the pattern of development of the surrounding area.

Therefore, project-related cumulative land use impacts would be less than significant.

CONCLUSIONS AND RECOMMENDATIONS

- The proposed project would result in the conversion of Farmland of Statewide Importance (as classified by the FMMP) to a non-agricultural use; however, due to low agricultural yields, the size of the conversion (21.95 acres), and the surrounding industrial development, this conversion would be less-than-significant.

- The proposed project would not conflict with existing agricultural zoning or Williamson Act contracts
- The proposed project would not disrupt or divide the physical arrangement of an established community.
- The proposed project is consistent with the applicable existing land use LORS with implementation of Conditions of Certification **LAND-1** and **LAND-2**. Please see **LAND USE Table 2**.
- The proposed project would not be physically incompatible with existing on-site or nearby uses, as it is consistent with the general character of these permitted uses and the pattern of development in the area.
- The cumulative implementation of the planned developments would result in the conversion of hundreds of acres of lands that are currently in agricultural production to urban land uses; however, project-related cumulative land use impacts would be less than significant

PROPOSED CONDITION OF CERTIFICATION

LAND-1 The project owner shall comply with the Subdivision Map Act (Pub. Resources Code Section 66410-66499.58) by adhering to the provisions of the Contra Costa County Code, Title 9 (Subdivisions), Chapter 92-2, Sections 92-2.002-.006 to ensure legality of parcels and site control.

Verification: At least 30 days prior to construction of the Oakley Generating Station Project, the project owner shall submit evidence to the CPM, of the approval and recordation of the project site lot line adjustment by Contra Costa County. The submittal to the CPM shall include evidence of compliance with all conditions and requirements associated with the approval, such as the Notice of Lot Line Adjustment by the county.

LAND-2 The project owner shall ensure that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's Conditional Use Permit requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.

Verification: At least 90 calendar days prior to the start of construction, including any demolition, grading, or site remediation on the project site, the project owner shall submit the proposed development plan to the city of Oakley for review and comment and to the Compliance Project Manager (CPM) for review and approval. The development plan shall incorporate the elements normally required by city for review and permitting of a similar project and as detailed in Attachment 1 (City of Oakley, Recommended Conditions of Approval, Oakley Generating Station) of the city of Oakley letter to the California Energy Commission (COO 2010c), including site layout, design and landscaping, transportation and circulation improvements, and the required permits. The project owner shall also provide the CPM with a copy of the transmittal letter to the city.

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

REFERENCES

CCGS 2009. Contra Costa Generating Stating/B. Bertacchi (tn: 52219). Application for Certification for Contra Costa Generating Station, dated July 30, 2009. Submitted to CEC/Docket Unit on July 30, 2009.

CCR 2006. California Code of Regulations, Title 14, Chapter 3 (CEQA Guidelines), §§15000-15387, as amended July 11, 2006.

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CH2M Hill 2010a. CH2M Hill/D. Davy (tn: 58676). ROC Regarding Clarification of Transmission Line Crossing. Submitted to CEC/P. Martinez on September 29, 2010. Dated September 29, 2010.

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CO0 2010a. City of Oakley, 2020 General Plan. Amended January 26, 2010. Site accessed at: http://www.ci.oakley.ca.us/subPage.cfm?page=572363. Date accessed: September 27, 2010.

COO 2010b. City of Oakley. Municipal Code, Title 9: Planning and Zoning. Current through Ord. 10-10, passed July 13, 2010. Site accessed at: http://www.codepublishing.com/CA/Oakley/. Date accessed: September 27, 2010.

COO 2010c. City of Oakley/R. Willis (tn: 56232). City of Oakley Comments. Submitted to CEC/Docket Unit April 5, 2010. Dated April 5, 2010.

COO 2010d. City of Oakley. Oakley Generating Station Cooperation and Community Benefits Agreement. March 31, 2010.

CO0 2009. City of Oakley, Updated Zoning Map. Site accessed at: http://www.ci.oakley.ca.us/UserFiles/File/planning/Zoning%20Map%20October%202009.pdf. Date accessed: September 28, 2010.

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COO 2003. City of Oakley, Resolution No. 53-03. A Resolution of the City of the City Council of the City of Oakley Adopting A Revised General Plan Fee to Recover City Costs incurred in Preparing the General Plan. Adopted August 11, 2003.

Contra Costa Co. 2008. Contra Costa County Code, Title 8 (Zoning). Current through Ordinance 2008-29, passed November 4, 2008.DOC 2008. California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program – Contra Costa County Important Farmland 2008. Site accessed at: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2008/con08.pdf. Date accessed: September 27, 2010.

PRC 2005. Public Resources Code §25000 et seq (Division 15 - Warren-Alquist State Energy Resources Conservation and Development Act), Chapter 6 - Power Facility and Site Certification, §§25500-25543; September 2005.

SOCIOECONOMICS

Kristin Ford

SUMMARY OF CONCLUSIONS

Staff concludes that construction and operation of the Oakley Generating Station (OGS) would not cause significant direct, indirect, or cumulative adverse socioeconomic impacts on the study area's housing, schools, law enforcement, and parks. Staff also concludes that the project would not induce substantial growth or concentration of population, substantial increases in demand for housing or public services, or displace a large number of people. Staff is proposing Conditions of Certification **SOCIO-1** and **SOCIO-2** to ensure that the project complies with the city of Oakley development fees and school impact fees.

INTRODUCTION

Staff's socioeconomics impact analysis evaluates the project's induced changes on existing population and employment patterns, and community services. Staff discusses the estimated impacts of the construction and operation of the OGS Application for Certification (AFC) on local communities, community resources, and public services, and provides a discussion of the estimated beneficial economic impacts of the construction and operation of the proposed project.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Socioeconomics Table 1 contains socioeconomics laws, ordinances, regulations, and standards (LORS) applicable to the proposed project.

Socioeconomics Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

State	
California Education Code, Section 17620	The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.
California Government Code, Sections 65996-65997	Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.
Local	
City of Oakley Park Land Dedication In-Lieu Fee (Ordinance No. 03-03)	The Park Land Dedication was enacted pursuant to authority granted by Section 66477 of the Government Code of the State of California ("Quimby Act").
City of Oakley Park Impact Fee (Authorized by Ordinance No. 05-00, adopted by Resolution No. 19-03)	The Oakley City Council has determined that a park impact fee is needed to finance public facilities and to pay for each development's fair share of the construction and acquisition costs of improvements.
City of Oakley Public Facilities Fee (Authorized by Ordinance No. 05-00, adopted by Resolution No. 18-03)	The Oakley City Council has determined that a public facilities impact fee is needed to finance public facilities and to pay for each development's fair share of the construction and acquisition costs of improvements.
Fire Facilities Impact Fee (Ordinance No. 09-01)	The Oakley City Council has determined that a fire impact fee is needed to finance those fire-fighting facilities and to pay for each development's fair share of the construction and acquisition costs of those improvements.

SETTING

The project would be located on the former DuPont manufacturing facility, on land owned by DuPont within the city of Oakley, Contra Costa County, California. The three most populated cities in Contra Costa County are Concord, Richmond, and Antioch; Oakley is the tenth largest city in the county.

Contra Costa County is one of the nine Bay Area Counties; San Joaquin, Alameda, Solano, Marin, Napa, San Francisco, Santa Clara, and Sonoma counties comprise the other eight (OG 2009a, 5.10-1). The proposed project would be located in a densely populated region with a large skilled workforce within commuting distance of the project. Sacramento and San Joaquin counties border Contra Costa County on the northeast and also have a large skilled workforce within commuting distance of the project (OG 2009a, 5.10-12).

Demographic Screening

Staff's demographic screening is designed to determine the existence of a minority or below-poverty-level population or both within a six-mile area of the proposed project site. The demographic screening process is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* (Council on Environmental Quality, 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses National* (Council on Environmental Quality, 1998). The screening process relies on Year 2000 U.S. Census data to determine levels of minority and below-poverty-level populations.

Minority Populations

According to *Environmental Justice: Guidance Under the National Environmental Policy Act*, minority individuals are defined as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. A minority population is identified when the minority population of the potentially affected area is greater than 50 percent or when one or more U.S. Census blocks in the potentially affected area have a minority population greater than 50 percent.

For the OGS project, the total population within the six-mile radius of the proposed site is 138,443 persons and the total minority population is 57,477 persons, or about 42 percent of the total population. (See **Socioeconomics Figure 1**). Staff in several technical areas which are identified in the Executive Summary, of this document, have considered environmental justice in their environmental impact analyses.

Below-Poverty-Level Populations

Staff has also identified the below-poverty-level population based on Year 2000 U.S. Census block group data within a six-mile radius of the project site. Poverty status excludes institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old. The below-poverty-level population within a six-mile radius of the OGS project is 10,145 people, or about 7.85 percent of the population in that area.

ASSESSMENT OF IMPACTS

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The socioeconomic resource areas evaluated by staff are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines and shown in **Socioeconomics Table 2**. Staff's assessment of impacts on population, housing, emergency medical services, police protection, schools, and parks and recreation, are based on professional judgments, input from local and state agencies, and the industry-accepted two-hour commute range for construction workers. Typically, substantial long-term relocation due to employment of people from regions outside the study area would have the potential to result in significant adverse socioeconomic impacts. Criteria for subject areas such as utilities, fire protection, water supply, and wastewater disposal are analyzed in the **Reliability, Worker Safety and Fire Protection**, and **Soil and Water Resources** sections of this document.

Socioeconomics Table 2
CEQA Environmental Checklist Form

	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
POPULATION AND HOUSING —Would the project:				
A. Induce substantial population growth in a new area, either directly or indirectly.				X
B. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
C. Displace substantial numbers of people, necessitating construction of replacement housing elsewhere?				X
PUBLIC SERVICES —Would the project:				
Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new of physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Emergency medical services				X
Police protection				X
Schools				X
Parks				X
Other public facilities				X
RECREATION—Would the project:				
Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

DIRECT/INDIRECT IMPACTS AND MITIGATION

Induce Substantial Population Growth

For the purpose of this analysis, staff defines “induce substantial population growth” as workers permanently moving into the project area because of project construction and operation, thereby encouraging construction of new homes or extension of roads or other infrastructure. To determine whether the project would induce population growth, staff analyzes the availability of the local workforce and the population within the region. Staff defines “local workforce” as the Oakland-Fremont-Hayward Metropolitan Division (MD) (Alameda and Contra Costa Counties.). A metropolitan division is a subset of an MSA having a single core with a population of 2.5 million or more. A MSA is a relatively freestanding metropolitan area (MA) typically surrounded by non-metropolitan counties.

Socioeconomics Table 3 shows the historical and projected populations of the study area.

Socioeconomics Table 3
Historical and Estimated Populations

Area	2000 Population	2009 Population	2020 Population
Oakley	25,619	34,468	NA
Contra Costa County	948,817	1,060,435	1,237,544
Source: DOF 2009			

As reported by the Department of Finance (DOF), E5 City/County Housing and Population Estimates; the three most populated cities within Contra Costa County are Concord, Richmond, and Antioch; which are all within 45 minutes commuting time of the project. **Socioeconomics Table 4 and 5** show that total labor by skill in the Oakland-Fremont-Hayward MD is more than adequate to provide construction labor for the OGS project.

Socioeconomics Table 4
Total Labor by Skill in the Oakland-Fremont-Hayward MD Annual Average for 2014

Trade	Oakland-Fremont-Hayward MD	Total # of Workers for Project Construction by Craft
Boilermakers	280	124
Carpenters	17,230	27
Electricians	4,640	114
Sheet Metal Workers	940	5
Laborers	14,390	32
Pipefitter	4,210	216
Painters	6,610	9
Bricklayers/Masons	270	6
Millwrights	500	24
Scaffolders	NA	27
Pile Drivers	430	5
Operating Engineers	4,130	32
Insulators	270	25
Source: EDD Labor Market Information; Occupational Employment Projections 2006-20016.		

The applicant estimates that construction would last from the first quarter of 2011 to the fourth quarter of 2013 (about 33 months). As shown in Table 5.10-8 in the AFC, the number of construction workers would range from 24 workers in the first month to a maximum of 729 in the 23rd month. The average number of workers onsite for the 33-month period would be 303 (OG 2009a, 5.10-12). In addition, construction of a sanitary sewer force main would involve up to ten additional construction workers during months one through six of the construction period, for approximately one month. Construction of the sanitary sewer force main would include local purchases of fuel and supplies.

The project operation would have 22 full-time employees and the applicant expects to hire all 22 employees locally (OG 2009a, 5.10-18). Given the large labor force within two hours commuting distance of the project, staff expects the operations workforce to already reside within the project area. Staff does not expect construction or operations workers to relocate to the immediate project area.

Staff concludes that the construction and operation workforces would not induce substantial growth or concentration of population and the OGS would not encourage people to permanently move into the area. The OGS would have no direct or indirect impact on substantial population growth in a new area.

Housing Supply

There are about 67 hotels/motels with 6,363 rooms in Contra Costa County to accommodate workers who may choose to commute to the project site on a workweek basis. The average daily room rate is $98. In addition to the available hotel/motel accommodation, there are numerous recreational vehicle parks in Oakley and neighboring cities close to the project site (OG 2009a, 5.10-16).

The applicant estimates the OGS would employ up to 22 full-time employees who would commute from within Contra Costa County and the region. Because of the large labor force within commuting distance of the project, staff expects that the majority of construction workers would commute to the project daily from their existing residences. No new housing construction would be required.

Staff concludes that the construction and operation workforces would not have a significant adverse impact on housing within the county-wide and regional areas of Contra Costa counties, and would not displace existing housing or necessitate construction of replacement housing elsewhere.

Displace Existing Housing and Substantial Numbers of People

The approximately 21.95-acre proposed OGS project site would be located within an existing 210.29-acre DuPont property. Upon project approval, a lot line adjustment to create “Parcel A”, which includes the 21.95-acre project site, two separate “B” and “C” parcels, and a 163.93-acre remainder parcel would be recorded. The proposed project site is primarily occupied by a vineyard (OG 2009a, 5.6-9). The project site is bounded to the west by the PG&E Antioch Terminal, a large natural gas transmission hub, to the north by DuPont property that is either industrial or vacant industrial, to the east by

DuPont's titanium dioxide landfill area, and to the south by the Atchison, Topeka and Santa Fe railroad. Immediately south of the railroad is a large parcel currently in agriculture (OG 2009a, 2-2).

Land within a one mile radius of the proposed project is located within the northern portion of the cities of Oakley and Antioch in northeastern Contra Costa County. The proposed site is located in Oakley, California. The proposed project site land uses immediately east and south of the project site is farmed as a vineyard. South of the proposed project site consists of industrial and vineyards which transitions into residential. The DuPont property and Sacramento-San Joaquin River Delta is located north of the project site (OG 2009a, 5.6-1). The land uses transition from agricultural to high-density residential approximately 0.75 miles east from the project site.

The project site is designated by the Oakley General Plan as Utility Energy (UE) (OG 2009a, 5.6-1). The transmission line alignment is comprised of several different land use designations including; commercial in Oakley and residential, open space, and focus area (undeveloped) in Antioch (OG 2009a, Figure 5.6-3). The proposed project is located within the jurisdiction of the Contra Costa County zoning ordinance. The project property is zoned Heavy Industrial (H-I) (OG 2009a, 5.6-15). The transmission line alignment is comprised of several different zoning designation including; Planned Business Center, Light Industrial, Service-Regional Commercial District, Planned Development District and Light Industrial District (OG 2009a, Figure 5.6-4).

The project site is proposed to be built within a primarily existing occupied vineyard and would therefore not displace existing housing or necessitate construction of replacement housing elsewhere.

Result in Substantial Physical Impacts to Government Facilities

As discussed under the subject headings below, the OGS would not cause significant impacts to service ratios, response times, or other performance objectives relating to emergency medical services, law enforcement, or schools. Fire protection, including the applicant's proposed onsite Fire Protection and Prevention Plan, is analyzed in the Worker and Fire Protection section of this document.

Emergency Medical Services

As stated in the AFC, the Hazmat Team of the East Contra Costa Fire Protection District (ECCFPD) is first responder to incidents involving hazardous materials. The Hazmat Team has 21 specialists and is stationed at 4333 Pacheco Boulevard, Martinez, California 94553. The response time is half an hour during the day and 1 hour if the incident occurs during off hours. There are Mutual Aid agreements with Hazmat Teams at Richmond and San Ramon Fire Departments (OG 2009a, 5.10-10).

All trauma injuries from the project location would be transported by helicopter to John Muir Medical Center in Walnut Creek. The Walnut Creek Campus is located 26 miles from the proposed project. John Muir Medical Center is designated as a Level II Trauma Center for Contra Costa County. Sutter Delta Medical Center is located 5.5 miles from the proposed project. The Emergency Department provides only Level II emergency. The Kaiser Permanente Walnut Creek Medical Center is located 27 miles from the

proposed project The Emergency Department has 52 private treatment rooms and is equipped to handle mass decontamination for chemical incidents (OG 2009a, 5.10-10).

As discussed in AFC Sections 2.0, **Project Description**, 5.16, **Worker Health and Safety and Fire Protection**, and 5.5, **Hazardous Materials Handling**, the OGS would be designed to meet all applicable standards to reduce the risk of an accidental hazardous materials release and operate in a manner that complies with safety standards and practices to provide a safe workplace for plant personnel.

The applicant's proposed safety procedures and employee training would minimize potential unsafe work conditions and the need for outside emergency medical response. Staff concludes that the emergency medical services provided by Hazmat Team of the East Contra Costa Fire Protection District and the three local hospitals mentioned above would be adequate during construction and operation. Thus, the project would not require construction of new or physically altered emergency medical facilities.

City of Oakley Fire Facilities Impact Fee (Ordinance No. 09-01) and Public Facilities Fee (Authorized by Ordinance No. 05-00, adopted by Resolution No. 18-03)

Staff received the "Response of City of Oakley to Request for Agency Participation and Request for Comments and Recommendations" letter on April 5, 2010 (COO 2010a). The letter represents the City of Oakley's response to the Energy Commission's Request for Agency Participation in the Review of the Contra Costa Generation Station Project. Attachment 1 of this letter provides the city of Oakley Comments and Recommendations on the Oakley Generating Station Project, specific to the City of Oakley Fire Facilities Impact Fee and Public Facilities Fee. In addition, staff discussed the Fire Facilities Impact Fee and Public Facilities Fee amounts with the City of Oakley, Community Development Director, Rebecca Willis, who indicated that the fee amount is based on the square footage of "building structures" such as offices, control rooms, bathrooms, meeting rooms, etc. The city indicated that the Public Facilities Fee would be $338 per 1,000 square feet and the Fire Facilities Fee would be $160 per 1,000 square feet.

Staff's analysis shows that construction and operation of the OGS would not have substantial adverse physical impacts to government facilities. However, for the project to comply with the above cited city of Oakley LORS, staff is proposing Condition of Certification **SOCIO-1**. Also, Title 20, California Code of Regulations, Chapter 5, § 1715 (a) (1) (A) would allow reimbursement to local agencies for certain fees, including fire and public facilities fees.

Law Enforcement

The OGS proposed project site is within the jurisdiction of the Oakley Police Department (OPD) (http://www.ci.oakley.ca.us). The OPD has one station that serves as headquarters, located approximately 1.8 miles from the proposed project site. The OPD has 25 full-time officers. The response time to an emergency from the project location is between 2 and 6 minutes (OG 2009a, 5.10-10).

The California Highway Patrol (CHP) is the primary law enforcement agency for state highways and roads. Services include law enforcement, traffic control, accident investigation and the management of hazardous material spill incidents. The nearest CHP office is located approximately 20 miles (http://www.chp.ca.gov) from the project site in Martinez, California.

In comparison to residential or commercial developments, power plants do not attract large numbers of people and thus require little in the way of law enforcement. Because of this factor and the proposed onsite safety and security measures, staff concludes that the existing law enforcement resources would be adequate to provide services to the OGS during construction and operation. Thus, the project would not require new or physically altered law enforcement facilities.

Education

The OGS site is in the Antioch Unified School District (AUSD). As stated in the California Department of Education, Educational Demographics Unit website, for the 2008-2009 school year, the number of schools in the AUSD is 28 with an aggregate enrollment of 166,958 students.

During construction, staff expects the labor force would commute daily from the region. Due to the commuting habits of construction workers and the costs of housing relocation, staff does not expect construction workers to relocate their families to the area. Staff does not expect a significant adverse impact to the schools from construction of the proposed project.

A total of 22 workers are needed to operate the OGS. As previously stated, the applicant expects to hire the operation workforce from within the county or the larger regional area, which includes the Bay Area, Sacramento, and San Joaquin counties. Assuming a worst-case scenario where all 22 operation workers relocate to Oakley, and using an average family size of 2.72 persons per household for Contra Costa County (U.S. Census Bureau, Household and Families, 2000 for Contra Costa County), the project would add approximately 16 school children (assuming a two-parent household) to the schools within the AUSD. Given the number of schools within these school districts, staff does not expect a significant adverse impact from the possible addition of 16 school children.

As previously noted in **Socioeconomics Table 1**, other than the requirement authorized under Section 17620 of the Education Code, the Energy Commission cannot impose developer fees to mitigate the cost of school facilities. Any industrial development within the AUSD is currently charged a one-time assessment fee of $0.36 per square foot for industrial development. Based on 18,600 square feet of occupied structures, OGS would pay $6,696 to the AUSD (OG 2009a, 5.10-20).

Given the small number of students who potentially could relocate to schools within the AUSD, staff does not expect the construction or operation of the project to have a significant adverse impact on schools.

Increase the Use of Existing Recreation Facilities

The Contra County Department Parks and Recreation maintains a variety of recreation buildings, community centers, trails and a historic park. The community parks amenities include playgrounds, picnic tables/barbeques, tennis courts, volleyball courts, sports court and basketball courts (http://www.co.contra-costa.ca.us).

Given the labor force and two hour commuting time within Contra Costa and surrounding counties, staff does not expect employees to relocate to the immediate project area. Staff concludes that there is a variety of parks within the regional project area and the project would not require construction of new parks nor substantially increase the use of existing parks. Therefore, the construction and operation workforce would not have a significant adverse impact on parks and recreation.

City of Oakley Park and Land Dedication In-Lieu Fee (Ordinance No. 03-03) and Park Impact Fee (Ordinance No. 05-00, adopted by Resolution No. 19-03)

Staff received the "Response of City of Oakley to Request for Agency Participation and Request for Comments and Recommendations" letter on April 5, 2010 (COO 2010a). The letter represents the City of Oakley's response to the Energy Commission's Request for Agency Participation in the Review of the Contra Costa Generation Station Project. Attachment 1 of this letter provides the city of Oakley Comments and Recommendations on the Oakley Generating Station Project, specific to the City of Oakley Park and Land Dedication In-Lieu Fee and Park Impact Fee. Staff discussed the Land Dedication In-Lieu Fee and Park Impact Fee amounts with the City of Oakley, Community Development Director, Rebecca Willis, who indicated that the fee amount is based on the square footage of "building structures" such as offices, control rooms, bathrooms, meeting rooms, etc. The city indicated that the Park Land Dedication Fee would be $538 per 1,000 square feet and the Park Improvement Fee would be $625 per 1,000 square feet.

Staff's analysis shows that construction and operation of the OGS would not have substantial adverse physical impacts to government facilities. However, for the project to comply with the above cited city of Oakley LORS, staff is proposing Condition of Certification **SOCIO-1**. Also, Title 20, California Code of Regulations, Chapter 5, § 1715 (a) (1) (A) would allow reimbursement to local agencies for certain fees, including land dedication and park fees.

As discussed above, staff determined that construction and operation of the OGS would not have substantial adverse physical impacts to recreation facilities. However, in accordance with Title 20, California Code of Regulations, Chapter 5, § 1715 and the local laws, ordinances, regulations and standards, staff determined that the applicant would be required to comply with the City of Oakley Land Dedication In-Lieu Fee and Park Impact Fee to offset future development impacts to in the city. Implementation of Condition of Certification Socio-1 would ensure the payment of these fees.

CUMULATIVE IMPACTS

A project may result in significant adverse cumulative impacts when its effects are cumulatively considerable; that is, when the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects [*Public Resources Code* Section 21083; *California Code of Regulations*, Title 14, Sections 15064(h); 15065 (c); 15130; and 15355]. Mitigation requires taking feasible measures to avoid or substantially reduce the impacts.

In a socioeconomic analysis, cumulative impacts could occur when more than one project in the same area has an overlapping construction schedule, thus creating a demand for workers that cannot be met locally. That increased demand for labor could result in an influx of non-local workers and their dependents, resulting in a strain on housing, schools, parks and recreation, law enforcement, and medical services.

As shown in **Socioeconomics Table 6,** the total construction labor force for the project and nearby MSA/MD would be more than sufficient to accommodate the labor needs for construction of power generation facilities and other large industrial projects. Based on the robust construction labor force, staff does not expect an influx of non-local workers and their dependents to the project area. Staff does not expect any significant and adverse impacts on housing, schools, parks and recreation, law enforcement, and emergency services. Staff does not expect construction or operation of the OGS to contribute to any significant adverse cumulative socioeconomic impacts.

Socioeconomics Table 6
Occupational Employment Projections by MSA/MD

Construction and Extraction Occupations for Selected MSA/MD	Average Annual Employment for 2006	Average Annual Employment for 2016
Vallejo-Fairfield MSA	14,070	11,200
Sacramento-Arden Arcade-Roseville MSA	74,290	81,940
Oakland-Fremont-Hayward MSA	80,120	84,380
Stockton MSA	15,870	16,550
TOTALS	**184,350**	**194,070**
Source: EDD 2009 Projections of Employment by Industry and Occupation		

NOTEWORTHY PUBLIC BENEFITS

Noteworthy public benefits include the direct, indirect, and induced impacts of a proposed power plant. For example, the dollars spent on or resulting from the construction and operation of the OGS would have a ripple effect on the local economy. This ripple effect is measured by an input-output economic model. The model relies on a series of multipliers to provide estimates of the number of times each dollar of input or direct spending cycles through the economy in terms of indirect and induced output, or additional spending, personal income, and employment. The typical input-output model used by economists and the one used for this analysis by the applicant is the IMPLAN model. IMPLAN multipliers indicate the ratio of direct impacts to indirect and induced

impacts. Staff reviewed the results of the IMPLAN model and found them to be reasonable considering data provided by the applicant as well as data obtained by staff from governmental agencies, trade associations, and public interest research groups.

OGS owners would employ workers and purchase supplies and services for the life of the project. Employees would use salaries and wages to purchase goods and services from other businesses. Those businesses make their own purchases and hire employees, who also spend their salaries and wages throughout the local and regional economy. This effect of indirect (jobs, sales, and income generated) and induced (employees' spending for local goods and services) spending continues with subsequent rounds of additional spending, which is gradually diminished through savings, taxes, and expenditures made outside the area.

For purposes of this analysis, direct impacts were said to exist if the project resulted in permanent jobs and wages; indirect impacts, if jobs, wages, and sales resulted from project construction; induced impacts, from the spending of wages and salaries on food, housing, and other consumer goods, which in turn creates jobs. Indirect and induced economic impacts from construction would take place over 33 months, from the first quarter of 2011 to the fourth quarter of 2013 (OG 2009a, 5.10-12). Indirect and induced economic impacts from operation would begin in the fourth quarter of 2013. All indirect and induced operation impacts would result from annual operations and maintenance expenditures. All construction and operation impacts would take place within Contra Costa County. The economic benefits of the proposed project as required by the Energy Commission regulations and resulting from the IMPLAN model are shown below in **Socioeconomics Table 7**.

Socioeconomics Table 7, OGS Economic Benefits (2009 dollars)	
Fiscal Benefits	
Estimated annual property taxes	$5.9 to $6.6 million annually
State and local sales taxes: Construction	$342,250 to $379,250
State and local sales taxes: Operation	$4,465 annually in Contra Costa County
Non-Fiscal Benefits	
Total capital costs	$450 to $500 million
Construction payroll	$111 to $124 million
Operations payroll	$3.5 million annually
Construction materials and supplies	$371.25 to $412.5 million of which $3.7 to $4.1 million would be spent in Contra Costa County
Operations and maintenance supplies	Annual estimate of $1.5 million of which $50,000 would be spent in Contra Costa County
Direct, Indirect, and Induced Benefits	
Estimated Direct Employment	
Construction	729 (peak employment)
Operation	22
Estimated Indirect Employment	
Jobs	21
Income	$763,960
Estimated Induced Income	
Jobs	138
Income	$5,773,980
Source: OGS, AFC, Socioeconomics 5.10	

PROPERTY TAX

The Board of Equalization (BOE) has jurisdiction over the valuation of a power-generating facility for tax purposes, if the power plant produces 50 megawatts (MW) or more. For a power-generating facility producing less than 50 MW, the county has jurisdiction over the valuation. The OGS would be a 624 MW power generating facility, therefore, BOE is responsible for assessing property value. The property tax rate is set by the Contra Costa County Assessor's office. The current property tax rate would be 1.3105 percent for fiscal year (FY 2007-2008). Assuming a capital cost of $450 to 500 million, the OGS would generate between $5.9 and 6.6 million in property taxes annually. The increase in property taxes resulting from the OGS project would be 0.1 percent of the city of Oakley's total FY 2008 property tax revenue. No significant adverse fiscal impacts are expected to result from project operations (OG 2009a, 5.10-20).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has received comments from the City of Oakley and has incorporated its responses in this document.

CONCLUSIONS

Estimated gross public benefits from the OGS include employment and income for the project area and region. Staff concludes that construction and operation of the OGS would not cause significant direct, indirect or cumulative adverse socioeconomic impacts on the study area's housing, schools, law enforcement, emergency services and parks.

Staff concludes that the project would not cause significant direct or cumulative adverse impacts to emergency services. Staff also concludes that the OGS would not induce substantial growth or concentration of population; induce substantial increases in demand for housing or public services; or displace a large number of people.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the Park Land Dedication Fee, Park Improvement Fee, Public Facilities Fee and the Fire Facilities Fee.

Verification: At least 30 days prior to the start of project construction, the project owner shall provide to the Compliance Project Manager (CPM) proof of payment of the Park Land Dedication Fee, Park Improvement Fee, Public Facilities Fee and the Fire Facilities Fee.

SOCIO-2 The project owner shall pay the one-time statutory school facility development fee to the Antioch Unified School District as required by Education Code Section 17620.

Verification: At least 30 days prior to the start of project construction, the project owner shall provide to the Compliance Project Manager (CPM) proof of payment of the statutory development fee.

REFERENCES

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California Highway Patrol, http://www.chp.ca.gov

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Contra County Department Parks and Recreation, http://www.co.contra-costa.ca.us

Oakley Police Department, http://www.ci.oakley.ca.us

OG 2009a – Oakley Generating Station (tn 52219). Application for Certification for the Contra Costa Generating Station, Volumes 1 and 2, dated June 30, 2009. Submitted to the CEC/Docket Unit on June 30, 2009.

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State of California, Employment Development Department (EDD) 2009. Labor Market Information, Occupational Employment Projections 2006-2016 Vallejo-Fairfield, Sacramento-Arden Arcade-Roseville, Oakland-Fremont-Hayward, and Stockton Metropolitan Statistical Areas, http://www.labormarketinfo.edd.ca.gov/?pageid=145

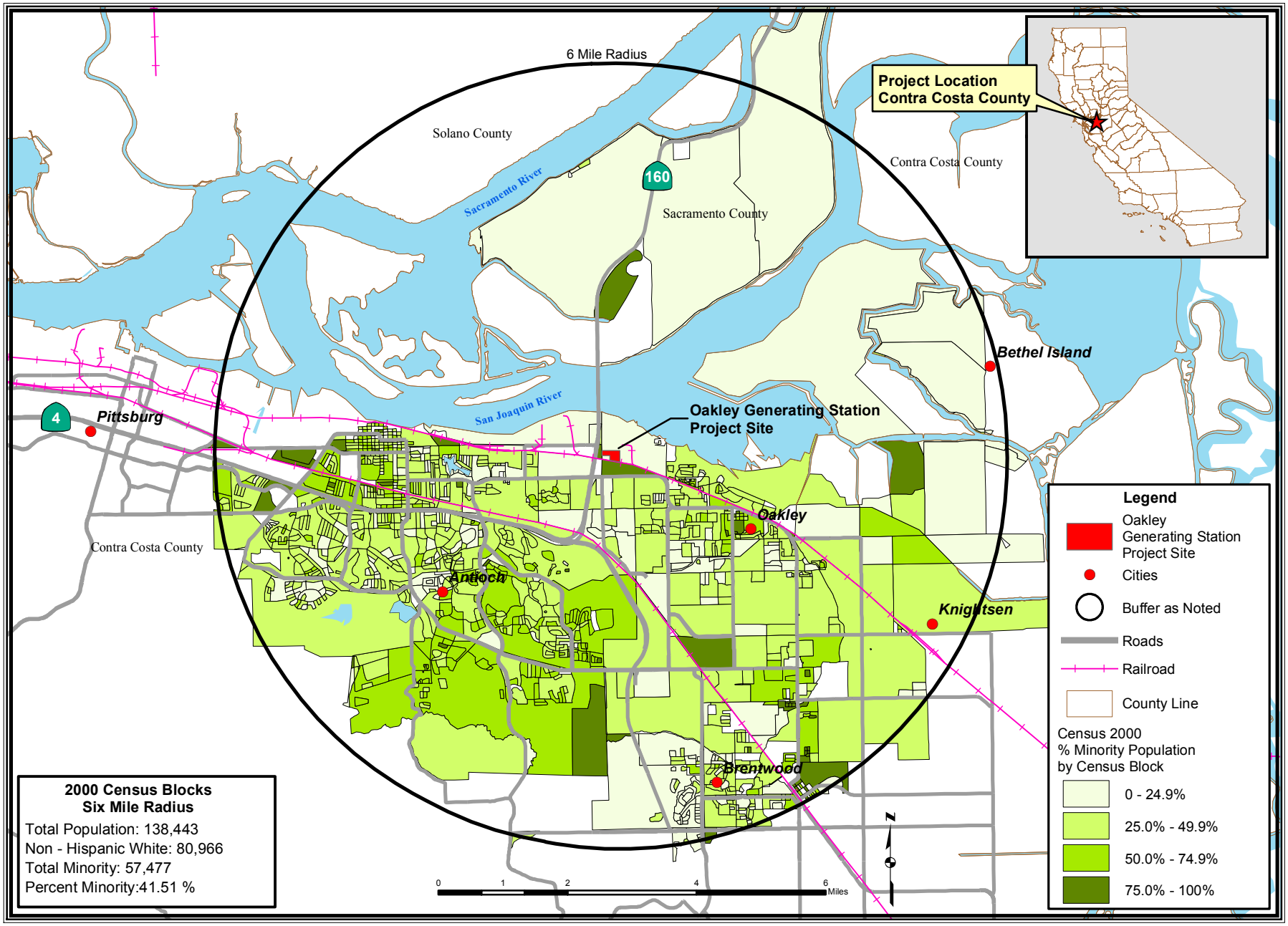
State of California, Department of Finance, Demographic Research Unit 2008. Table 2:E5 City/County Housing and population estimates 1/01/2008, http://www.dof.ca.gov/research/demographic/reports

U.S. Census Bureau, Household and Families, 2000 for Contra Costa County, http://quickfacts.census.gov/qfd/states/06/06013.html

U. S. Environmental Protection Agency (EPA), Office of Federal Activities. 1998. Final Guidelines for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance.

SOCIOECONOMICS - FIGURE 1

Oakley Generating Station - Census Minority Population by Census Block - Six Mile Radius



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ESRI and Tele Atlas Data - California Energy Commission Statewide Power Plant Maps 2010 - Census 2000 PL 94-171 Data

SOIL AND WATER RESOURCES

Mark Lindley, P.E.

SUMMARY OF CONCLUSIONS

Energy Commission staff has not identified any immitigable potentially significant impacts to Soil and Water Resources for Oakley Generating Station (OGS) and believes that OGS would comply with all applicable Laws, Ordinances, Regulations and Standards (LORS) provided the proposed conditions of certification are implemented.

Energy Commission staff concludes the following:

- Implementation of Best Management Practices (BMPs) during OGS construction and operation in accordance with effective Storm Water Pollution Prevention Plans (SWPPP) and a Drainage Erosion and Sediment Control Plan (DESCP), would avoid significant adverse effects that could otherwise result in significant transport of sediments or contaminants to Mitigation Wetland E by wind or water erosion.
- Staff has recommended additional measures and minor adjustments to the applicant's proposed erosion control and stormwater quality Best Management Practices to help ensure that potential impacts to existing weltands adjacent to the project site are reduced to less than significant levels.
- The project's use of recycled water within three years of commencing operations would limit freshwater use and provide consistency with the Energy Commission and State Water Resources Control Board policies on the use of fresh inland water for industrial uses and power plant cooling.
- The project would not be located within the 100-year flood plain, and would not increase flood conditions downstream of the project.
- The discharge of wastewater under the conditions stipulated in the Ironhouse Sanitary District's Wastewater Discharge Permit would meet the Central Valley Regional Water Quality Control Board's standards.

Where the potential for impacts has been identified, staff is proposing mitigation measures to reduce the impact to less than significant. The mitigation measures, as well as specifications for LORS conformance, are included as conditions of certification.

INTRODUCTION

This section analyzes potential impacts to soil and water resources from the construction and/or operation of the OGS proposed by Radback Energy, Inc.. The analysis specifically focuses on the potential for the project to cause impacts in the following areas:

- Whether the project's use of water would deplete existing supplies and impact current users or the environment.
- Whether project construction or operation would lead to degradation of surface or groundwater quality.

- Whether construction or operation would lead to accelerated wind or water erosion and sedimentation.
- Whether the project would exacerbate flood conditions in the project vicinity.
- Whether the project would impact the hydrology of the existing mitigation wetland in the northwest corner of the project site.
- Whether the project will comply with all applicable LORS.

Where the potential for impacts are identified, Energy Commission staff has proposed mitigation measures to reduce the significance of the impact, and as appropriate, has recommended conditions of certification to ensure that any impacts are less than significant and the project complies with all applicable LORS.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Federal, State, and Local LORS that apply to the OGS related to soil and water resources are summarized below in **Soil & Water Table 1**. Energy Commission staff has reviewed the project as proposed to determine if the proposed project will meet the requirements set forth in the Federal, State, and Local LORS.

Soil & Water Table 1
Laws, Ordinances, Regulations, and Standards

Federal LORS	
Clean Water Act (33 U.S.C. Section 1251 et seq.)	The Clean Water Act (33 USC § 1257 et seq.) requires states to set standards to protect water quality, which includes regulation of stormwater and wastewater discharges during construction and operation of a facility. California established its regulations to comply with the Clean Water Act under the Porter-Cologne Water Quality Control Act of 1967. These are normally addressed through a general National Pollutant Discharge Elimination System (NPDES) permit. For OGS, regulation of water quality is administered by the Central Valley Regional Water Quality Control Board (CVRWQCB).
Resource Conservation and Recovery Act	The Resource Conservation Recovery Act (RCRA) of 1976 (42 USC§ 6901 et seq., implemented at 40 CFR Part 260 et seq.) seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
40 Code of Federal Regulations, Part 423	The provisions of this part of the CFR are applicable to discharges resulting from the operation of a generating unit by an establishment primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium.
National Resources Conservation Service (NRCS), National Engineering Handbook, Sections 2 and 3 (1983)	Sections 2 and 3 of the USDA-NRCS National Engineering Handbook (1983) provide standards for soil conservation and erosion prevention during construction activity.
State LORS	
California Constitution, Article X, Section 2	This section requires that the water resources of the State be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited.
California Environmental Quality Act, Public Resources Code Section 21000 et seq.	Defines CEQA Guidelines which contain the definitions of projects that can be considered to cause significant impacts to soil and water resources if not mitigated. The Energy Commission is the authority responsible for administration.
California Public Resources Code Section 25523(a); CCR Sections 1752, 1752.5, 2300-2309 and Chapter 2.5. Article 1	Sections 1752, 1752.5, 2300-2309 and Chapter 2, Subchapter 5, Article 1, Appendix B, Part (i) provide for the protection of environmental quality. They further require submission of information related to possible environmental effects to the Energy Commission. The Energy Commission must include environmental protection in their decision on the AFC.
The California Safe Drinking Water and Toxic Enforcement Act	This Act (California Health & Safety Code Section 25249.5 et seq.) prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The Regional Water Quality Control Board (RWQCB) administers the requirements of the Act.
The Porter-Cologne Water Quality Control Act of 1967, Water	Requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. Those regulations require that the RWQCBs issue Waste Discharge Requirements

Code Sec 13000 et seq.	specifying conditions for protection of water quality as applicable.
California Water Code Section 13260	Requires filing with the appropriate RWQCB a report of waste discharge that could affect the water quality of the state, unless the requirement is waived pursuant to Water Code section 13269.
California Water Code Section 13550	Identifies the use of potable domestic water for industrial uses as a waste or unreasonable use of water if a suitable supply of reclaimed water is available. The availability of reclaimed water is determined provided that the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and the use will not impact downstream users or biological resources.
California Water Code Section 13552.6	Specifically identifies the use of potable domestic water for cooling towers, if suitable reclaimed water is available, as a waste or unreasonable use of water. The availability of reclaimed water is determined based on criteria listed in Section 13550 by the SWRCB.
California Code of Regulations, Title 17	Title 17, Division 1, Chapter 5, addresses the requirements for backflow prevention and cross connections of potable and non-potable water lines for projects that utilize reclaimed water.
California Code of Regulations, Title 22	Title 22, Division 4, Chapter 15, requires the California Department of Public Health (DPH) to review and approve the wastewater treatment systems to ensure they meet tertiary treatment standards allowing use of recycled water for industrial processes such as steam production and cooling water. DPH also specifies Secondary Drinking Water Standards in terms of Consumer Acceptance Contaminant Levels, including TDS ranging from a recommended level of 500 mg/l, an upper level of 1,000 mg/l and a short term level of 1,500 mg/l.
California Code of Regulations, Title 23	Title 23, Division 3, Chapter 15, requires the RWQCB to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
Delta Protection Act of 1992	Created mandates for the formation of primary and secondary Zones within the Sacramento-San Joaquin Delta and created the Delta Protection Commission to provide jurisdiction over all development activities within the primary zone. OGS is located in the secondary zone.
Local LORS	
Contra Costa County Zoning Ordinance Title 10, Chapter 1014	Requires compliance with the Contra County Clean Water Program and the development of a Stormwater Management Plan.
Contra Costa County Clean Water Program	Requires significant new or redevelopment projects in Contra Costa County to design and implement storm water treatment measures to reduce the discharge of storm water pollutants to the maximum extent practicable.
City of Oakley Municipal Code	Provides standards of design for construction of drainage and erosion control elements. Requires permits for construction activities occurring within the limits of the City's jurisdiction. Permits are required for: grading, erosion control, encroachment, and onsite paving.
State Policies and Guidance	
SWRCB Resolution 77-1	State Water Resources Control Board Resolution 77-1 encourages and promotes recycled water use for non-potable purposes.
SWRCB Resolutions 75-58 and 88-63	The principal policy of the SWRCB that addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on

	June 19, 1976, by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. Resolution 75-58 defines brackish waters as "all waters with a salinity range of 1,000 to 30,000 mg/l" and fresh inland waters as those "which are suitable for use as a source of domestic, municipal, or agricultural water supply and which provide habitat for fish and wildlife". In a May 23, 2002 letter from the Chairman of the SWRCB to Energy Commission Commissioners, the principal of the policy was confirmed 'that the lowest quality cooling water reasonably available from both a technical and economic standpoint should be utilized as the source water for any evaporative cooling process utilized at these facilities'. Resolution 88-63 defines suitability of sources of drinking water. The total dissolved solids must exceed 3,000 mg/L for it not to be considered suitable, or potentially suitable, for municipal or domestic water supply.
SWRCB Res. 2009-0011 (Recycled Water Policy)	This policy supports and promotes the use of recycled water as a means to achieve sustainable local water supplies and reduction of greenhouse gases. This policy encourages the beneficial use of recycled water over disposal of recycled water. This policy states the following recycled water use goals: "Increase the use of recycled water over 2002 levels by at least one million acre-feet per year (AF/y) by 2020 and by at least two million AF/y by 2030; Increase the use of stormwater over use in 2007 by at least 500,000 AF/y by 2020 and by at least one million AF/y by 2030; Increase the amount of water conserved in urban and industrial uses by comparison to 2007 by at least 20 percent by 2020; and Included in these goals is the substitution of as much recycled water for potable water as possible by 2030."
Integrated Energy Policy Report (Public Resources Code, Div. 15, Section 25300 et seq)	In the 2003 IEPR, consistent with SWRCB Policy 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy stating they will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound." Additionally, the Energy Commission will require zero liquid discharge technologies unless such technologies are shown to be "environmentally undesirable" or "economically unsound".
California Water Code Section 461	Encourages the conservation of water resources and the maximum reuse of wastewater, particularly in areas with limited water supply.

REGIONAL SETTING

The OGS project site is located in the City of Oakley, in eastern Contra Costa County. The project site is generally located at the southern edge of the Sacramento-San Joaquin Delta (Delta) at an elevation of approximately 32 feet above mean sea level (MSL). The land uses of the areas surrounding the site are a mix of industrial, vacant industrial, commercial, and agricultural.

Climate

The project area has a moderate climate that is influenced by coastal fog and the San Francisco Bay. The average annual precipitation, recorded at the Antioch meteorological station is 13.2 inches, with the majority of rainfall occurring between October and April (OG 2009a). The average daily temperature ranges from 48 to 73 degrees Fahrenheit (California Climate Data Archive, website accessed 4-21-2010).

The average annual reference evapotranspiration as measured at Brentwood is approximately 53.5 inches (CIMIS 2010). The mean freeze-free period is approximately 250 to 275 days (OG 2009a).

Surface Water

The San Joaquin River is located immediately north of the OGS site and flows northward towards the Sacramento-San Joaquin Delta, which subsequently discharges into the San Francisco Bay. The San Joaquin River has a drainage basin of approximately 15,880 square miles and contributes approximately 13 percent of the flow in the Delta. The Delta is a freshwater tidal estuary covering approximately 1,150 square miles. The Delta has been highly modified by channelization and diversions for municipal, industrial and agricultural uses. As a result of these modifications, the Delta is considered an impaired water body. Wetlands adjacent to the San Joaquin River are present approximately 0.5 mile north and 0.4 mile northeast of the project site. The project site is located in Zone X as defined by the Federal Emergency Management Agency (FEMA). Zone X is outside of the 100-year and 500-year floodplains (OG 2009a).

Groundwater

The OGS is located in the San Joaquin Valley Basin, Tracy subbasin. The Tracy subbasin is “defined by the areal extent of unconsolidated to semi-consolidated sedimentary deposits that are bounded by the Diablo Range on the west; the Mokelumne and San Joaquin Rivers on the north; the San Joaquin River to the east; and the San Joaquin-Stanislaus County line on the south” (DWR, 2006). The total surface area of the Tracy subbasin is approximately 539 square miles, with an estimated storage capacity of 1.3 million acre-feet (DWR, 2006).

The water-bearing deposits include the Tulare formation, older and younger alluvium and flood basin deposits. Groundwater levels have remained relatively stable over the past 10 years, with seasonal fluctuations due to pumping and recharge. The basin is used for municipal and industrial supply with average well yields of 500 to 3,000 gallons per minute and average well depths of 188 feet for domestic wells and 352 feet for irrigation and municipal wells.

The quality of the groundwater varies throughout the basin with the areas of high chloride occurring near the San Joaquin River and areas of high nitrate in the northwestern portion of the basin. Elevated total dissolved solids (TDS) levels are also found in this subbasin with an average concentration of approximately 1,190 mg/L (DWR, 2006).

Water Supply & Treatment

Municipal water in the project vicinity is provided by the Diablo Water District (DWD). The primary source of water for DWD is from the Delta, purchased from the Contra Costa Water District. Water supplied to the City of Oakley is a blended mix of pumped groundwater and Delta water (CCWD, 2008).

The Ironhouse Sanitation District (ISD) receives and treats wastewater in the area. ISD is currently constructing a tertiary treatment plant to provide recycled water to the

region. Upon completion, the ISD plant will be capable of producing up to 3.5 million gallons per day of recycled water for industrial uses.

PROJECT, SITE AND VICINITY DESCRIPTION

The proposed OGS project would construct a natural gas-fired, combined-cycle electrical generating facility with a nominal generating capacity of 624 megawatts. The facility would consist of two 213 MW combustion turbine-generators (CTG) with evaporative inlet cooling, one steam turbine generator (STG), heat recovery system generators (HRSGs), an air cooled condenser for process cooling, and an evaporative fluid cooler to supplement the air-cooled heat exchanger during hot weather (OG 2009a).

The OGS site is located to the northeast of the junction of Highway 160 and Highway 4 in the City of Oakley. The site is bounded to the west by PG&E's Antioch Terminal, a large natural gas transmission hub, the vacant and industrial DuPont property to the north, DuPont's titanium oxide disposal area to the east and the Burlington Northern Santa Fe railroad to the south (OG 2009a). The OGS site is located within the "Western Development Area" (WDA) of a 210-acre parcel owned by DuPont. The WDA is a green field site within a brown field site (OG 2009a). The project area is currently zoned Heavy Industrial with a land use designation of Utility Energy in the Oakley General Plan.

The 21.95-acre project site is currently used as a vineyard and was never developed for industrial uses as part of the DuPont property. The site is relatively flat and generally slopes to the west. A 1.6-acre conservation area, which includes a 0.62-acre mitigation wetland (Wetland E), is adjacent to the western property line (OG 2009a).

The construction laydown and parking area would be located east and immediately adjacent to the project site. This area is outside of the WDA in an area that was used by DuPont for titanium oxide disposal during manufacturing activities. The titanium oxide landfill is still present and is approximately 3 feet thick. Approximately 6 acres of the 20-acre laydown area are currently paved, with the remaining 14 acres supporting non-native grassland (CH2MHILL 2010c).

Natural gas would be supplied to the OGS by a 140 foot pipeline connection to the Antioch Terminal, just south of the project site. The OGS will connect to an existing 24-inch potable water supply line located within the DuPont property that is served by DWD. The project would construct a new 6-inch diameter, 0.44-mile long force main to connect to an existing ISD sewer line with sufficient capacity located south of the project site on Main Street (CH2MHILL 2010c).

Electricity generated by OGS would be transported from a 230-kilovolt (kV) onsite switchyard and delivered to the grid via a 2.4-mile long 230 kV transmission line. The transmission line would be constructed within Pacific Gas and Electric's (PG&E) 80 feet wide right-of-way that runs from the project site to the south and west to the Contra Costa Substation.

Soils

The soils at the proposed OGS site generally consist of sands. The entire site, construction laydown area, and the majority of the transmission corridor are located within a single Natural Resources Conservation Service (NRCS) soil map unit – Delhi sand. These soils are somewhat excessively drained with a low shrink-swell potential. The soils at the site are in Hydrologic Soil Group A. Two additional soil map units, Sycamore silty clay loam and Zamora silty clay loam, are present in a portion of the transmission corridor. These soils have a moderate to moderately slow permeability with a moderate shrink-swell potential. The primary soil types located at the proposed project site, laydown area and transmission corridor are described below in **Soil & Water Table 2.** Additional soil characteristic data can be found in Table 5.11-1 of the Application for Certification (AFC) (OG 2009a).

Soil & Water Table 2
Primary Soil Types Potentially Affected & Characteristics

Primary Soil Name	Slope Class	Water Erosion Potential	Wind Erosion Potential	Permeability	Land Capability Class
Delhi Sand	2 to 9%	Low	High	Rapid	6e (non-irrigated)
Sycamore Silty clay loam	0 to 2%	Moderate	Moderate	Moderate – Moderately slow	4c (non-irrigated)
Zamora Silty clay loam	0 to 2%	Moderate	Moderate	Moderately slow	4c (non-irrigated)

OGS, 2009a, Table 5.11-1

A preliminary geotechnical investigation was conducted to evaluate engineering characteristics of the soils. The Preliminary Geotechnical Report, dated June 2009, indicates that a potentially liquefiable layer exists at the OGS site. A final geotechnical investigation will be conducted during development of the final design to confirm the presence or absence of this soil and recommend mitigation measures (OG 2009a).

Phase I and II Environmental Site Assessments (ESA) were conducted for the 44.4 WDA area of the DuPont facility in 2004. The Phase I ESA indicates that no manufacturing processes were ever conducted within the WDA, which includes the OGS site but not the laydown area (OG 2009a). The report found no indications of contaminants released to soils within the WDA parcel and found low potential for soils to be contaminated by offsite sources. However, due to the planned future development of the site and its proximity to the DuPont manufacturing facility a Phase II ESA was recommended.

As part of the Phase II investigation, 39 soil samples were collected from 21 locations at between zero and 6 feet below the ground surface. The samples were analyzed for volatile organic compounds (VOCs) and inorganic compounds, polychlorinated biphenyls (PCBs), petroleum compounds, dioxins, and furans. No compounds were found to be present above screening levels or risk-based screening concentrations (RBSCs). One exception was arsenic which is naturally occurring at the site and was

not found above background levels for this site. The Phase II ESA found that the WDA parcel does not require any further investigation prior to redevelopment (OG 2009a).

The construction laydown area was previously used by DuPont as a disposal area for titanium oxide (TiO_2) which is still present in a layer approximately 3 feet thick (OG 2009a). The location of this layer relative to existing grade and proposed grades is not clear at this time. However, excavation below ground surface is not proposed for the laydown area, so the likelihood of encountering the titanium dioxide landfill during construction activities is low.

During construction, OGS proposes to lower the site grades by up to 7 feet to generate fill for future development on the DuPont property. Approximately 94,000 cubic yards (CY) of material would be removed from the project site and stockpiled in three areas on the DuPont property north of the project site. The stockpiles would be up to 20 feet high with slopes of 4:1 (horizontal to vertical).

Groundwater

The OGS site is located approximately 0.6 mile from the San Joaquin River and has a relatively shallow groundwater table. There are three hydrostratigraphic layers of groundwater at the project site identified as the surficial, upper and lower aquifers (OG 2009a). This water bearing unit consists of a 120 foot thick layer of unconsolidated alluvial deposits underlain by the relatively impermeable Montezuma Formation. Groundwater flow at the site is generally north toward the San Joaquin River. The groundwater levels vary seasonally with high levels following the spring runoff period and low levels at the end of the dry season. The depth to groundwater ranges from approximately 5 to 15 feet below ground surface (CH2MHILL 2010c). There are no groundwater wells located at the OGS site.

The Phase I and II ESA for the WDA area includes an evaluation of groundwater contamination adjacent to the WDA. This investigation found a groundwater plume present at the eastern boundary of the WDA with source areas that are cross-gradient to the WDA. Groundwater samples were collected and analyzed. Concentrations of chlorofluorocarbons (CFCs), carbon disulfide and 1,1-dichloroethane were detected in the upper and lower aquifers. In 2004, two additional groundwater monitoring wells were installed to confirm that concentrations were below site-specific water quality objectives. One well was installed in the surficial aquifer and one in the upper aquifers. Groundwater sampling was conducted and analysis results indicated that only CFC-113 was detected in either well. The concentration found was below the water quality objective and the California Maximum Contaminant Limit (MCL). It was determined that there is a low likelihood of contamination from the area east of the WDA to migrate cross-gradient into the WDA (and OGS) site. As of 2004 additional wells were to be installed to continue monitoring of the groundwater plume. No additional information is known of the installation and monitoring of these wells.

It is likely that groundwater will be encountered during construction and may fluctuate seasonally. The OGS would not make use of groundwater for construction activities or during operation.

Stormwater

The entire OGS site is currently a vineyard that is tilled biannually with a row of eucalyptus trees at the northeastern edge. Surface runoff from rainfall events currently infiltrates or flows toward the northwest corner of the proposed OGS site. All of the surface runoff from the site is discharged to an existing mitigation wetland (Wetland E) located at the northwest corner of the project site. Wetland E receives runoff from a 25-acre area which includes the 22-acre OGS site and approximately 3 acres at the adjacent Antioch natural gas terminal site located to the east and south of the OGS site.

Wetland E has an area of approximately 0.62 acres and was found to be an isolated non-jurisdictional wetland by the USACE (CH2MHILL 2010c). The wetland was constructed as mitigation for a nearby project and is located in a 1.6-acre conservation easement. The California Department of Fish and Game (CDFG) is the grantee for the easement and maintains the right to restrict or prevent activities that would be deleterious to the intended function of the wetland (OG 2009a). The wetland does not currently have an outlet and in the event of an extreme runoff event, any discharge would flow over the low point in the existing road at the northern boundary of the easement (CH2MHILL 2010c). A culvert currently connects the wetland to a stormwater sump at a nearby DuPont parking lot. The culvert functions as an emergency spillway for the sump and has not been operated in the past five years. This connection would be removed as part of the proposed project to eliminate potential input of untreated stormwater from the nearby parking lot (CH2MHILL 2010c). Two additional non-jurisdictional wetlands are located near the proposed stockpile areas. Wetland D and F are 0.38 acres and 0.37 acres, respectively.

Stormwater runoff from the bare soil and vegetated portion of the construction laydown area either infiltrates or sheet flows toward an existing stand of eucalyptus trees. Runoff from the paved portion of the laydown area sheet flows to the north and out of the laydown area.

The project stormwater system is intended to maintain the hydraulic connection to Wetland E while providing additional treatment for the runoff discharged to the wetland. The applicant has committed to maintaining the hydrologic function of Wetland E in the Wetland E Management Plan prepared for the California Department of Fish and Game (CH2MHILL 2010k). OGS proposes to use three vegetated bioswales and a detention pond to provide water quality treatment for runoff from the project site prior to discharge to Wetland E. The proposed detention pond also provides additional detention storage to limit the potential for flood related impacts downstream of the project site. OGS proposes to use a single vegetated bioswale in the central portion of the laydown area to capture and infiltrate runoff generated within the laydown area.

Project Water Supply

The OGS project will require water for construction and operational uses. During construction, water will be required for dust control, moisture conditioning (for compaction), and other uses. The source of water for construction will be the existing potable water main at the site (OG 2009a).

During operations, the OGS will require water for process and potable uses. Process water uses will include CTG inlet evaporative cooling, Reverse Osmosis (RO) permeate makeup, and blowdown makeup. Plant makeup water would be fed directly from the DWD connection, or an Ironhouse recycled water connection, to a 400,000 gallon service water/fire water storage tank. The storage tank will provide approximately eight hours of operational storage and two hours of fire protection storage. This water would be used directly for plant service water, irrigation, fire protection, and makeup to the RO system and CTG inlet air evaporative coolers. The RO system would be used to demineralize makeup water for the steam cycle and combustion turbine wash water (OG 2009a). The OGS would include a 130,000-gallon demineralized water storage tank to provide 48 hours of storage to meet peak demands.

During periods of high ambient temperatures, the air cooled heat exchanger would not be able to sufficiently cool the closed loop cooling water. To supplement the cooling system during these periods the OGS would use evaporative fluid coolers. This results in higher water use during peak demand periods, which typically coincide with high temperatures.

Initially, project water supply would be potable water provided by DWD from an existing 24-inch water main that runs north-south through the project site. The water usage rates are summarized below in **Soil & Water Table 3.** Operational fresh water use is estimated to be about 240 acre-feet per year (AFY) with about 124 afy dedicated to evaporative cooling and inlet air cooling.

Soil & Water Table 3
OGS Water Usage Rates

OGS Water Use	Average Daily Use Rate (gpm)	Maximum Daily Use Rate (gpm)	Average Annual Use* (acre-feet)
Construction - DWD Potable Water Supply	150	400	96
Operations - DWD Potable Water Supply	95	369	240
HRSG	41	41	64
Evaporative Fluid Cooler	0	147	41
Inlet Air Cooling	31	158	83
Equipment Washdown / Irrigation	4.7	4.7	7.3
Potable Supply	0.5	0.5	0.8
Wastewater Discharge	68	159	132

* Assumes 8,449 hours of operation with 1,500 hours at peak use rates.

The applicant received a will-serve letter from DWD stating that sufficient potable water is available for the OGS project. DWD will provide up to 250 acre-feet per year to the OGS with peak flow rates of approximately 370 gallons per minute (OG 2009a). The OGS has no planned source for backup water supply for the project.

The applicant has indicated their commitment to the use of recycled water for process needs when it becomes available. The OGS facility would be constructed with additional space to accommodate installation of a microfiltration system to treat recycled water.

The ISD is currently constructing a new wastewater treatment plant to provide tertiary treated recycled water.

The new ISD wastewater treatment plant is located about 2.5 miles east of the OGS site and is scheduled to be completed in October 2011. Preliminary plans developed by ISD call for 3.6 mile long, 14-inch dia. recycled water pipeline running along Main Street and Bridgehead Road to Wilber Avenue, passing by the OGS project site. A 150-hp pump station at the ISD wastewater treatment plant would be required to deliver up to 3.5 million gallons per day (MGD) to the Wilber Avenue industrial users. The majority of the pipeline would be installed in open trenches with at least one railroad crossing, which would likely require jack and bore techniques (CH2MHILL 2010c).

When OGS converts to a recycled water supply, water use at the plant would increase by about 11 percent due to the additional micro- and ultra-filtration required to treat the recycled water prior to use in the plant. Peak water demand at OGS would increase to about 409 gpm or about 2.64 MGD, which is about 22 percent of ISD's current dry weather flow (CH2MHILL 2010c). Average recycled water demand would be about 105 gpm or about 247 AFY.

Process and Sanitary Wastewater

The OGS would generate wastewater streams during construction and facility operation. Potential construction wastewater streams include sanitary wastewater, equipment washing, line testing, and excavation dewatering. It is anticipated that water applied for dust suppression and compaction will be controlled such that there will be no discharge. Sanitary waste would be collected in portable toilets and hauled offsite for disposal at a receiving facility. Wastewater from equipment washing activities would be collected and disposed of offsite. In total, approximately 510,000 gallons of wastewater would be generated by construction activities (OG 2009a).

Wastewater streams from plant operations include reject from the RO system, blowdown condensate, wash water and stormwater from equipment containment areas. This wastewater will be directed to the plant process drain system. Wastewater from process areas that could include oil or lubricants will be directed to an oil-water separator for treatment. The effluent from the oil-water separator would be combined with the other plant wastewater streams and sanitary wastes before being directed to the wastewater lift station. The wastewater would be pumped from the OGS and discharged into ISD's existing sanitary sewer system.

The industrial wastewater generated by OGS would be approximately 68 gpm on average and 159 gpm as a maximum when using fresh water supplied by DWD. The total annual average wastewater volume from OGS would be approximately 43 million gallons or 132 acre-feet (OG 2009a) when using the fresh water supply.

When OGS converts to a recycled water supply, wastewater discharge would be expected to increase by 15-19 percent due to the additional filtration required and backwash returned to the wastewater treatment facility. Peak wastewater discharge would increase to about 200 gpm, and average discharge would be about 78 gpm. On an annual basis, about 51 million gallons or 157 acre-feet of wastewater would be discharged when using the recycled water supply (CH2MHILL 2009c). In addition, the

quality of the wastewater discharge would decrease and salinity levels and concentrations of aluminum and other constituents would be outside of the ISD wastewater discharge requirements. Additional wastewater treatment may also be required at OGS if the facility converted to a recycled water supply.

The applicant has received a will serve letter from ISD indicating that they will have capacity to accept and treat a wastewater flow up to 200 gallons per minute from the OGS. Wastewater discharged from the OGS will need to meet all requirements set forth by ISD. Wastewater would be discharged to a new 6-inch force main and pumped 0.44 miles to ISD's 18-inch gravity sewer line near the intersection of Bridgehead Road and Main Street (CH2MHILL 2010c).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section provides an evaluation of the expected direct, indirect and cumulative impacts to soil and water resources caused by construction, operation and maintenance of the proposed OGS project. Energy Commission staff's analysis of potential impacts consists of a brief description of the potential effect, an analysis of the relevant facts, and application of the threshold criteria for significance to the facts. If mitigation is warranted, Energy Commission staff provides a summary of the proposed mitigation and a discussion of the adequacy of the proposed mitigation. If necessary, Energy Commission staff presents additional or alternative mitigation measures and refers to specific conditions of certification related to a potential impact and the required mitigation measures. Mitigation is designed to reduce potentially significant project impacts to a level that is less than significant.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The proposed OGS project was evaluated to determine whether its construction or operation would result in erosion of soils, the deposition of sediments into surface waters or the contamination of either groundwater or surface water. Staff also evaluated the potential of the project's proposed water use to cause a significant depletion or degradation of local and regional water resources.

There are extensive regulatory programs in effect designed to prevent or minimize these types of impacts. Compliance with these programs, absent unusual circumstances, will ensure that significant impacts do not occur. The regulatory procedures typically offer a suite of options for addressing the potential impacts and include performance standards so that impact avoidance or minimization is ensured.

To evaluate potential significant impacts to soil or water resources, staff assessed:

- If construction or operation would lead to accelerated wind or water erosion and sedimentation.
- If the project would exacerbate flood conditions in the vicinity of the project.
- If the project would significantly impact the hydrologic function or water quality in mitigation Wetland E and other wetlands in the vicinity of the project.

- If the project's water use would cause a substantial, or potentially substantial, adverse change in the quantity or quality of water supplies including those derived from groundwater or surface water.
- If project construction or operation would lead to degradation of surface or groundwater quality.
- If the project would comply with all applicable LORS.

These criteria are based on the California Environmental Quality Act (CEQA) Guidelines and performance standards. The threshold of significance for project impacts is based on the ability of the project to be built and operated without violating applicable erosion, sedimentation, flood, surface or groundwater quality, water supply, or wastewater discharge standards.

The federal, state, and local LORS and policies presented in **Soil & Water Table 1** represent the applicable standards used for the OGS analysis. These LORS support a comprehensive regulatory system, with adopted standards and established practices designed to prevent or minimize adverse impacts to soil and water resources. For those project impacts that exceed standards or result in a significant adverse impact, conditions of certification may be necessary to ensure compliance with standards or require mitigation measures to reduce the impacts to a less than significant level.

DIRECT/INDIRECT IMPACTS AND MITIGATION

A discussion of direct and indirect impacts associated with the construction and operation of the proposed OGS is presented below. Potential impacts to soil, storm water, water quality, and water supply including the applicant's proposed mitigation measures and staff's determination of the adequacy, are discussed below. If necessary, staff will propose additional mitigation measures and refer to specific conditions of certification.

Construction Impacts and Mitigation

Construction of the proposed OGS project will include vegetation removal; soil excavation and stockpiling; grading; building and pipeline construction; and the installation of utility connections. Water will be used primarily for dust suppression, moisture conditioning, and pipeline testing during construction. Potential impacts to soils related to increased erosion or the release or migration of hazardous materials are possible during construction activities. Water quality could be impacted by the discharge of eroded sediments from the site or hazardous materials released during construction. Flood hazards could increase as a result of construction of impervious surfaces at the project site.

Water and Wind Erosion

The OGS site is currently a vineyard that would be covered by pavement, gravel, and structures during construction. The paved portions of the construction laydown area would remain unchanged during and following construction. The unpaved portions of the laydown area would be graded and covered with gravel during construction and hydroseeded following construction.

The OGS project site would be subject to water and wind erosion during construction, which is expected to occur over a 33-month period. The project site is relatively flat and the sandy soils at the OGS site have relatively low water erosion potential and relatively high wind erosion potential. Construction of OGS would permanently disturb the entire 22-acre OGS site and temporarily disturb 14 acres of the 20-acre construction laydown area. Active grading would occur over a two month period. The disturbed soil would remain exposed at the site over a period of approximately 25 months with about 50 percent of the exposed area being bare soil (CH2MHILL 2010c).

Earthwork activities at the site would include removal of topsoil and vegetation; foundation excavation; excavation and compaction for site grades; and trenching for underground systems. The applicant indicates that about 94,000 CY of soil would be excavated to lower the site by 6 to 7 feet. This material would be stockpiled in three areas (approximately 7 acres) at the DuPont facility located just north of the project site. The material placed in the stockpile areas would be up to 20 feet high and sloped at 4H:1V. The stockpiles would be surrounded by soil berms or fiber rolls, covered with geotextiles, and hydroseeded. The applicant plans to stabilize the stockpiles before handing control and responsibility of the stockpiles to DuPont. (OG 2009a).

Site linear construction would include installation of about 2.4 miles of new 230-kV transmission lines. Transmission line work would occur within an existing PG&E right of way requiring the replacement of 17 existing steel lattice towers with steel monopole towers. The towers are located on land with a variety of uses including industrial and commercial property, non-native grasslands, vineyards, and landscaped residential properties. The applicant did not specify erosion control BMPs for transmission line construction.

A 0.44-mile long, 6-inch diameter sanitary sewer force main would be installed within existing streets using standard open trench methods. The force main would be installed within short segments of open trench, limiting the potential for wind and water erosion during construction. The applicant did not specify erosion control BMPs for site linear construction.

The applicant prepared a draft Drainage Erosion and Sediment Control Plan / Stormwater Pollution Prevention Plan (DESCP/SWPPP) that provides conceptual plans for erosion and drainage control measures including BMPs to be implemented during construction of the OGS. This plan was prepared to comply with the new SWPPP Construction General Permit requirements that took effect July 1, 2010 (CH2MHILL 2010c). The following erosion control measures are proposed: scheduling to minimize disturbed areas exposed during the rainy season; preservation of existing vegetation; hydroseeding; placement of geotextiles and mats; soil stabilization; non-vegetative stabilization; application of water or dust palliative to control dust at disturbed areas haul roads and parking areas; and stockpile management. Additionally, sediment control measures are planned to trap detached sediment particles and prevent off-site migration. The following sediment control measures are proposed: silt fence; fiber rolls; gravel bags berms; sand bag barriers; straw bale barriers; street sweeping or vacuuming; stabilize construction and site entrance/exits.

The applicant believes that the relatively flat site and the use of construction BMPs will reduce the potential for soil loss and erosion to a negligible level. The applicant estimated that soil loss at the site due to water erosion would be reduced from approximately 63.4 tons without mitigation to about 1.5 tons with the implementation of erosion and sediment control BMPs during construction. The most likely mechanism for erosion during construction is wind erosion of exposed soils during grading activities. The applicant estimated wind borne soil loss at the site would be reduced from about 12 tons without mitigation measures to about 5.4 tons through the use of dust control BMPs (OG 2009a).

Energy Commission staff agrees that proper application of erosion control and sediment control BMPs can reduce the impact to soil resources from wind and water erosion to a level that is less than significant. During active excavation and along construction roads, watering may need to be applied as often as several times per hour to limit significant wind erosion and fugitive dust emissions, especially during periods of high winds or frequent vehicle traffic.

One area that is of particular concern to Energy Commission staff, are the proposed stockpiles. Given the sandy, non-cohesive nature of the soils at the site, the relatively steep 4H:1V slopes, and proposed stockpile height of 20 feet, the potential for wind and water erosion is relatively high. Adding to the concern is the close proximity of the proposed stockpiles to sensitive wetlands. In addition to the BMPs identified by the applicant in the draft SWPPP, Energy Commission staff recommends a number of additional measures to ensure that these soil stockpiles do not lead to significant erosion related impacts. Staff recommends that fiber rolls should be placed on the stockpile slopes every 15 feet in accordance with California Stormwater Quality Association (CASQA) guidelines (BMP SE-5) (CASQA 2009). The stockpile areas should be watered following hydroseeding as necessary to develop a good stand of grass prior to the onset of the rainy season. Staff is also concerned that the hand off of responsibility for maintenance of the soil stockpiles to DuPont, could occur prior to full stabilization. The applicant should maintain responsibility for the maintenance and management of the stockpiles for at least two full wet seasons to ensure that the stockpiles are fully vegetated and stabilized prior to passing responsibility to DuPont or provide documentation indicating DuPont would maintain the stockpiles and ensure they remain stabilized after they are handed over.

Proper implementation and maintenance of the BMPs outlined in an approved DESCP would limit erosion and migration of soils from the OGS site and into the nearby wetlands and the San Joaquin River. With the additional efforts recommended by Energy Commission staff for the proposed soil stockpiles, Energy Commission staff believes the proposed plans are reasonable at this level of project planning to avoid significant adverse impacts due to wind and water erosion. The applicant should also identify specific erosion control and sediment trapping BMPs for transmission line construction prior to construction. Condition of Certification **SOIL&WATER-1** would require OGS to prepare a final DESCP for both construction and operations, to assure these BMPs are implemented, and to identify post-construction BMPs to stabilize the project site. Similar to the DESCP and in accordance with federal law, the RWQCB specifies that OGS is to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for construction activity required under Condition of Certification

SOIL&WATER-2. The applicant may develop a single DESCP/SWPPP to satisfy Conditions of Certification **SOIL&WATER-1** and **-2**, provided that the report fully addresses the requirements for both documents.

Soil and Groundwater Contamination

The Phase I & II ESAs did not identify contaminants at the project site above screening levels or risk-based screening concentrations (RBSCs). The groundwater plume located east of the boundary of the WDA was determined to be unlikely to migrate to the project site. The applicant has indicated that the TiO_2 landfill at the laydown area is not expected to present a human health or wildlife risk (CH2MHILL 2010c). As part of the final DESCP and SWPPP, the applicant should include information indicating the magnitude and extent of any planned disturbance of this TiO_2 material and provide mitigation measures to limit migration of TiO_2 material if necessary.

During construction, there is also the potential for hazardous chemicals to be released from construction equipment or materials storage areas. The applicant identified a number of BMPs related to construction equipment and materials storage in the draft SWPPP including: good housekeeping practices for storage of construction materials and chemicals, the use of a designated washing and fueling areas for construction equipment, and concrete waste management practices.

Energy Commission staff believes that these measures will be effective to limit the potential for migration soil impacted by TiO_2 material and existing groundwater contamination or a release of hazardous materials to cause adverse impacts to soil and groundwater during construction of the proposed OGS project. Condition of Certification **SOIL&WATER-2** requires the applicant to prepare and implement a final SWPPP for construction activity as specified by the RWQCB. The construction SWPPP would provide details on BMPs for construction equipment maintenance and fueling, hazardous materials storage, and other waste management practices.

Groundwater – Dewatering

The groundwater table at the OGS site fluctuates seasonally and ranges from approximately 5 to 15 feet below ground surface. Perennial ponding in Mitigation Wetland E is reflective of the high water tables at the project site. It is likely that groundwater would be encountered during excavation and construction of the OGS facilities and transmission line. The applicant indicates that dewatering may be required for construction of the replacement transmission towers (CH2MHILL 2010c). At this time, the applicant has not provided a specific dewatering plan or an estimated volume of discharge from construction dewatering activities. An additional geotechnical investigation is planned for the project site to support detailed design activities. The applicant would need to provide a plan for management and discharge of water from construction dewatering activities. The applicant should include groundwater sampling in its dewatering plan to ensure that the cross-gradient contaminant plume identified in the Phase II ESA has not migrated to the project site as a result of construction activities. The applicant would need to address any potential groundwater dewatering in the final SWPPP in order to meet the Conditions of Certification **SOIL&WATER-2.** This should include a detailed dewatering plan for construction including information on anticipated volumes and discharge methods.

Staff proposes that the applicant comply with Condition of Certification **SOIL&WATER-3**, which requires the project owner to submit a complete Notice of Intent (NOI) for compliance with Central Valley RWQCB Order No. R5-2008-0081 for Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters. Through submittal of the NOI for coverage under Order No. R5-2008-0081 and implementation of the dewatering BMPs in the final SWPPP, the Central Valley RWQCB will determine the adequacy of the planned BMPs to protect water quality and will impose more stringent discharge requirements if necessary. Compliance with Conditions of Certification **SOIL&WATER-2** and **-3** would prevent significant impacts to both groundwater and surface water resources from construction dewatering activities (CVRWQCB 2008).

Stormwater

OGS's proposed stormwater management BMPs would be installed early in construction and prior to the onset of the wet season. OGS proposes to utilize bioswales and a detention basin to capture and treat stormwater runoff prior to discharge to existing Mitigation Wetland E.

Three bioswales are proposed for the project site (Bioswales 1-2, 4, and 5). In the most recent stormwater management plans, Bioswale 1-2 that was originally proposed as two separate bioswales was combined into one long swale in the most recent stormwater management plans and Bioswale 3 was deleted to expand the proposed detention basin.

Each bioswale would incorporate a perforated riser to control outflows from the swale. The risers are intended to pass lower flow rates generated during small frequent storm events through the swales and onto either Mitigation Wetland E or the proposed detention basin while detaining runoff from larger runoff events. The risers would allow the water quality flowrate (discharge generated by a rainfall intensity of 0.2 inches/hour) to flow through the swale at about 1 foot of depth. The Bioswales are each designed to detain runoff up to 3 feet deep before overtopping and passing additional runoff directly to Mitigation Wetland E or the proposed detention basin (CH2MHILL 2010u).

Bioswale 1-2 would be approximately 1,320 feet long with a base width of 2 feet. This bioswale would capture and treat runoff from the northern and eastern portions of the project site and discharge directly to Mitigation Wetland E. Bioswale 4 would be about 320 feet in length with a 2 foot base width. Bioswale 4 captures runoff from the southwestern portions of the project site and discharges directly into Bioswale 5. Bioswale 5 would be about 150 feet long and captures runoff from the existing Antioch natural gas terminal. Bioswale 5 discharges into the proposed detention basin (CH2MHILL 2010u).

The proposed detention basin would be located on the western end of the project site adjacent to Mitigation Wetland E. The basin would provide water quality treatment for runoff from the southern and eastern portions of the project site and stormwater storage to augment the flood control storage provided in Mitigation Wetland E. The basin would have about 2 acre-feet of storage capacity within a 0.6-acre area. The basin would

utilize a perforated riser to control lower flow rates for small frequent storm events and to pass larger flow rates directly to Mitigation Wetland E. The proposed riser includes perforations beginning 0.25 foot above the basin floor and is intended to drain the pond within 24 hours. The detention basin would be separated from the mitigation wetland by a berm that would be up to 3 feet above existing grade (CH2MHILL 2010u). The berm is intended to be planted with trees to provide visual cover for the OGS plant.

Within the construction laydown area, a 1,350 feet long bioswale is proposed to capture and infiltrate stormwater runoff. The proposed bioswale is centrally located within the laydown area, and the graded portions of the laydown area would be graded to drain towards the proposed bioswale (CH2MHILL 2010c).

The applicant developed a Stormwater Monitoring Plan with the draft SWPPP (CH2MHILL 2010c). Stormwater discharges to existing wetlands including Mitigation Wetland E and the wetlands adjacent to the proposed soil stockpiles would be visually inspected for high turbidity following storm events greater than 0.5 inches because the proposed project is a Risk Level 1 site. If there were issues that could indicate the potential for non visible contamination such as the failure of a BMP or a hazardous materials spill, samples would be collected at the monitoring point where impacted stormwater is suspected and submitted to a certified laboratory for analysis (CH2MHILL 2010c).

Energy Commission staff believes that the proposed stormwater BMPs would generally be adequate to limit potential impacts related to increases in stormwater runoff volumes and flow rates or water quality impacts. To improve sediment trapping during construction, Staff recommends the use of filter fences around the outlet structure risers with the bioswales and detention basin. The filter fences would be removed following completion of construction and revegetation. Trapping suspended sediments and contaminants with filter fences prior to discharge to the wetland would limit potential impacts to the wetland to a less than significant level. Depending upon the level of sedimentation in the bioswales and detention basin, accumulated sediments may need to be removed and the BMPs may need to be reseeded following construction.

Proper implementation and maintenance of the BMPs outlined in an approved DESCP would limit flood and water quality impacts related to increases in stormwater runoff and changes in runoff patterns during construction. With the additional efforts recommended by Energy Commission staff to improve sediment trapping within the bioswales and detention basin, Energy Commission staff believes the proposed plans are reasonable at this level of project planning to avoid significant adverse impacts due to increases in stormwater runoff and changes in drainage patterns. Condition of Certification **SOIL&WATER-1** would require OGS to prepare a final DESCP for both construction and operations, to assure these BMPs are implemented, and to maintain these BMPs following construction. Similar to the DESCP and in accordance with federal law, the RWQCB specifies that OGS is to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for construction activity required under Condition of Certification **SOIL&WATER-2**. The applicant may develop a single DESCP/SWPPP to satisfy Conditions of Certification **SOIL&WATER-1 & -2**, provided that the report addresses the requirements for both documents.

Construction Water Supply

The OGS project would require water for dust suppression, compaction, and miscellaneous activities during construction. It is estimated that the total water use would be approximately 100,000 gallons per day with an average annual use of 31.3 million gallons or 96 afy (CH2MHILL 2010c). The proposed construction water supply would be potable water provided by Diablo Water District (DWD). The primary source of this water is untreated water purchased from the Contra Costa Water District (CCWD) through the United States Bureau of Reclamation (USBR) Central Valley Project (CVP) which relies on the Sacramento-San Joaquin Delta (DWD, 2005). DWD also currently uses local groundwater for a portion (less than 20 percent) of its supply (DWD, 2005).

The CVP has experienced frequent reductions in water allocations to water supply districts due to regulatory restrictions during drought periods. Because of pumping restrictions in the Delta and CVP restrictions on water allocations to municipal, industrial and agricultural users over the past several years and into the future, staff believes that other water users could potentially be impacted by the use of fresh water for OGS construction (See Operational Water Use discussion for more details). Staff recommends Condition of Certification **SOIL&WATER-4** that limits the use of freshwater to the construction period and for a maximum of three years of operations. Within three years of operation, **SOIL&WATER-4** requires OGS to convert to a recycled water supply.

Wastewater

Construction wastewater generated onsite would include equipment washdown water, water from pressure testing the service utilities, and concrete washout wastewater. Wastewater generated from pipe cleaning and flushing (10,000 gallons) would be tested and discharged to the sanitary sewer. Wastewater from the hydrotesting (300,000 gallons) would be tested and discharged to the Mitigation Wetland E if clean. If sampling indicates the presence of hazardous liquids, the wastewater will be disposed of offsite. Additionally, it is estimated that the construction of the OGS project would generate approximately 200,000 gallons of sanitary waste (OG 2009a) to be disposed of offsite.

Improper handling or containment of construction wastewater could cause a broader dispersion of contaminants to soil, groundwater or surface water. Potential contaminants could reach Wetland E via surface transport if not properly contained. The shallow groundwater and water table fluctuation at the site could transport spilled contaminants into the wetland via subsurface flow.

Staff is concerned that wastewater from hydrostatic testing may contain low level contaminants that may or may not be detected prior to discharge to the stormwater system that drains to Mitigation Wetland E. The applicant should provide a more detailed description of the planned disposal location, sampling, and analysis of the hydrotesting water as part of the final DESCP/SWPPP. The planned approach should be developed in accordance with Condition of Certification **SOIL&WATER-3** or described otherwise if not applicable to the requirements of this Condition of Certification.

During construction, wastewater would be managed with BMPs identified and implemented in accordance with the construction SWPPP required by the RWQCB, consistent with Condition of Certification **SOIL&WATER-2**. Energy Commission staff concludes that no significant impacts from construction wastewater will occur provided that all construction wastewater is handled in accordance with BMPs described in the project's construction SWPPP and Notice of Intent.

Operation Impacts and Mitigation

Operation of the OGS could lead to potential impacts to soil, stormwater runoff, and surface and groundwater quality. Soils may be potentially impacted through erosion or the release of hazardous materials used in the operation of OGS. Stormwater runoff from the OGS could result in potential impacts if increased runoff discharged from the site increases downstream flooding. Water quality could be impacted by discharge of eroded sediments or hazardous materials released during operation. Potential impacts to soil, stormwater, water quality, flooding, water supply, and wastewater related to the operation of the OGS including proposed mitigation measures, are discussed below.

Soil

The operation and maintenance of the proposed OGS would not involve soil-disturbing activities. During operation of the OGS, the site would be covered with impervious surfaces, gravel, or landscaping limiting exposed soil. Normal vehicular traffic would be limited to roadways that would be paved or graveled. Hazardous materials used in OGS operations would be stored in areas equipped with curbs or containment dikes to contain spills or leaks. As a result, impacts to soils related to erosion or hazardous materials handling during operations will not be significant.

OGS would develop an Industrial SWPPP that includes BMPs for refueling and maintenance of equipment, protection of hazardous materials from stormwater exposure, and the preparation and implementation of spill contingency plans for hazardous materials storage areas. The applicant expects that with proper implementation of these and other BMPs identified in the Industrial SWPPP, no significant impacts to soil resources or surface water quality would occur during the long-term operation of the OGS (OG 2009a).

The Industrial SWPPP would include BMPs to protect stormwater from impacts related to soil erosion and hazardous materials release including the preparation and implementation of spill contingency plans for hazardous materials storage areas. With implementation and maintenance of the BMPs detailed in the Industrial SWPPP and DESCP, Energy Commission staff believes there would be no significant impacts to soil resources during operation of OGS. Staff recommends Condition of Certification **SOIL&WATER-5** that requires the project owner to comply with the General NPDES Permit for Discharges of storm water associated with industrial activity. In addition, the DESCP required in Condition of Certification **SOIL&WATER-1** also requires implementation and maintenance of erosion control BMPs during operations. These plans may be integrated to meet the Energy Commission requirements for the DESCP and Regional Board requirements for the SWPPP. This combined document shall be approved by the CPM and implemented in accordance with Condition of Certification

SOIL&WATER-1 and **SOIL&WATER-5** to reduce soil related impacts to less than significant during operation of the facility.

Stormwater

During operations, OGS would route stormwater runoff through a series of bioswales and a detention basin prior to discharge to Mitigation Wetland E. Contact runoff from areas with oil or other lubricants would be directed to an oil-water separator and directed to the sanitary sewer system. The proposed stormwater management plans for OGS must meet the requirements of the NPDES Permit, Contra Costa County Clean Water Program, and the City of Oakley.

Staff reviewed the proposed stormwater management plans to determine if the plans would meet the local design requirements and mitigate potentially significant impacts. Staff reviewed the proposed plans and identified two primary areas of concern:

1. Water Quality Treatment – The proposed BMPs for OGS need to meet the minimum water quality treatment standards required by Contra Costa County under the County's NPDES Permit issued by the Regional Water Quality Control Board. Since the proposed project plans to discharge all runoff to Wetland E, adequate water quality treatment is particularly important to limit the discharge and concentration of pollutants in Wetland E.

2. Mitigation Wetland E – To limit impacts to the hydrologic function of Wetland E, the proposed stormwater management plans must limit changes in delivery of runoff to Wetland E. In particular, proposed stormwater BMPs should not impede the delivery of runoff to Wetland E through capture and infiltration during small, frequent rainfall events.

The applicant provided a revised stormwater drainage design that addressed comments provided by Energy Commission staff in a technical memorandum dated August 17, 2010 (PWA 2010a, CH2MHILL 2010u).

During operations at the 22 acre OGS project site, about 25 percent (5.4 acres) would be impervious surfaces (paved, concrete pads, or buildings) and about 37 percent (8.2 acres) would be compacted rock (CH2MHILL 2010u). This increase in impervious surface would result in increases in the volume and peak flow rate of stormwater runoff from the site. The proposed stormwater management system aims to reduce potential impacts due to increases in peak flows and volumes by using stormwater features to capture, detain, and infiltrate these runoff to a level less than or equivalent to existing conditions. Additionally, the OGS project is required to provide water quality treatment for the stormwater runoff generated by the project to protect Wetland E from adverse water quality impacts. The proposed stormwater management system is also intended to maintain the current hydrologic function of Wetland E following construction of the OGS.

The proposed stormwater management plan would direct surface runoff to three bioswales (linear bioretention) facilities for conveyance and water quality treatment and/or to a detention basin (pond) prior to releasing the runoff to Wetland E. The proposed layout of these facilities is presented in Figure 163994-SS-3001, Rev 2,

(CH2MHILL, 2010u). Each of the bioswales and the detention basin would have an outlet structure with a vertical standpipe. The outlet structures would discharge low flows via orifices and high flows via weir flow into the top of the vertical circular standpipe.

The proposed stormwater system is intended to:

- Provide water quality treatment for stormwater runoff
- Maintain the existing function and hydrologic connection to Wetland E
- Capture and detain runoff such that there is no discharge from the wetland (discussed under Flooding Potential, below)

Energy Commission staff reviewed the sizing of the proposed BMPs and confirmed that the BMPs have sufficient area and capture volume to meet Contra Costa Counties water quality requirements. Energy Commission staff also examined the proposed BMP outlet designs to confirm that the proposed BMPs would maintain the existing function and hydraulic connection to Wetland E. Energy Commission staff has identified a number of concerns related to the proposed outlet structure designs (discussed in greater detail below):

1. Bioswale 5 riser/low flow orfice design does not take into account the full contributing watershed to the bioswale resulting in orifices that are too small, which would limit discharge of runoff to Wetland E potentially impacting the hydrologic connection.

2. Detention Pond riser/low flow orifice design includes orifices located 3 inches above pond bottom which would result in the capture and infiltration of a significant portion of runoff from small frequent events, limiting discharge to Wetland E.

3. Detention Pond riser/lowflow orifice design limits flows from larger events from efficiently passing to Wetland E.

4. All risers include a single row of orifices either at the riser base (Bioswales) or 3 inches above the base (Pond) which could be subject to clogging further limiting the hydraulic connection to Wetland E.

<u>Water Quality Treatment/BMP Sizing</u>
The applicant developed the design for the proposed bioswales and pond based on the procedure for Low Impact Development (LID) and Integrated Management Practices (IMP) set forth in the Contra Costa Clean Water Program (CCCWP) *Stormwater C.3 Guidebook* (C.3 Guidebook). Provision C.3 of the RWQCB NPDES permit for new and redevelopment requires minimization of impervious areas; protection from sources of stormwater pollutants; treatment prior to discharge from the site; runoff less than or equal to pre-project peaks and durations; maintenance of treatment and flow-control features (CCCWP, 2008). The CCCWP developed a LID approach to meet these requirements and the C.3 Guidebook provides a methodology to ensure consistent implementation of the C.3 requirements. The C.3 guidebook provides two options for BMP sizing: Option 1 - treatment control which results in smaller BMPs and Option 2 – treatment and flow control which results in lager BMPs with increased treatment and mitigation of flow increases associated with smaller rainfall events. The applicant

selected Option 2: to develop the BMPs to meet treatment and flow control standards. Given that OGS would discharge directly to a mitigation wetland with no outlet, Staff agrees with the applicant's selection of treatment and flow control because this approach results in improved water quality treatment as compared to a treatment only approach.

The C.3 Guidebook provides sizing factors for selected BMPs based on local hydrologic soil groups. The entire project is located in Hydrologic Soil Group A due to the sandy soils at the site. These sizing factors and the planned surface conditions (paved, gravel, lanscape) for each drainage area were used to estimate the minimum surface area and treatment volume required for each IMP. The design criteria were used to size BMPs to meet the treatment requirements by capturing the treatment volume over a required minimum treatment area.

Bioswale #1-2 would treat runoff from about 11.3 acres in northern and eastern portions of the OGS project site. Using the C.3 sizing factors, the required treatment volume would be about 0.25 acre-feet, the minimum treatment area would be about 0.30 acres, resulting in a maximum average depth of 0.83 feet (CH2MHILL, 2010u). Bioswale #1-2 would be about 1,323 feet long with a 2 foot wide base and 3H:1V side slopes. With an average depth of 0.81 feet and maximum depth of 1.35 feet, Bioswale #1-2 would meet the CCCWP requirements for treatment volume and minimum area.

Bioswales 4 and 5 and the proposed pond would provide water quality treatment for runoff generated on about 12.02 acres in the southwest portion of the project site and the adjacent PG&E Antioch terminal. Due to site constraints, Bioswales 4 and 5 would not have sufficient area to meet the CCCWP treatment requirements, and the proposed pond would provide the required treatment capacity for the southwest areas of the project site. While Bioswales 4 and 5 would not fully meet the required treatment capacity, these swales would augment the treatment capacity provided in the pond.

The pond was sized based on a volumetric sizing methodology using the CCCWP's Unit Basin Storage Size for 80% Capture. Based on an estimated directly connected impervious area of about 50 percent and the mean annual precipitation at the project site, the applicant estimated that the required treatment volume was about 0.3 acre-feet. The proposed pond would provide 0.3 acre-feet of storage volume at a depth of about 0.84 feet (CH2MHILL, 2010u).

Staff concurs with the applicant's proposed sizing of the pond and bioswales for water quality treatment, and believes that the facilities have adequate volume and treatment area to meet the guidelines set forth by CCCWP.

<u>Hydrologic Connection to Wetland E/Hydraulic Structure Design</u>
To maintain the hydraulic connection with the Mitigation Wetland, the applicant proposes to incorporate low flow orifices in risers at the outlet structures to each of the bioswales and the pond. The low flow orifices are intended to meter the discharge from each BMP to control flows while allowing smaller frequent flows to pass on to Mitigation Wetland E. With the sandy soils at the project site, this approach is important to limit infiltration losses during extended periods of detention with the bioswales and the pond.

The low flow orifices proposed for each of the bioswales would be located at the base of the swale. Bioswale #4 would discharge into Bioswale #5 which would discharge into the pond. The pond and Bioswales #1-2 would discharge on to a floodplain bench just above the permanent pool within the Wetland E. The low flow orifices for each bioswale were sized to allow the water quality flow rate (flow generated by a 0.2 inch/hour rainfall intensity) with 1 foot of depth (CASQA 2009). This sizing approach allows for smaller frequent stormflows to pass through the bioswales without excessive detention and infiltration.

Staff concurs with the applicant's sizing calculations for Bioswales #1-2 and # 4. However, the sizing on Bioswale #5 did not account for the additional flow from Bioswale #4, and the orifices for Bioswale #5 would be too small to allow for the water quality flow rate to pass on to the pond. Thus, Staff recommends that the applicant revise orifice sizing for Bioswale #5 to account for the entire contributing watershed including the watershed that discharges into Bioswale #4.

The proposed outlet structure for the pond would have orifices located about three inches above the pond bottom. This would result in the capture and infiltration of the first 0.09 acre-feet of runoff that reached the pond including the runoff that is generated at the PG&E Antioch terminal and currently comprises the majority of flows to the Mitigation Wetland. The orifices for the pond were sized to allow the remaining water quality volume (0.30 – 0.09 = 0.21 acre-feet) to drain within 24 hours. The proposed orifice configuration and sizing would be generally acceptable, and would be appropriate for a facility with a deeper treatment depth.

However, staff is concerned that the proposed design for the pond outlet structure could significantly limit the hydraulic connection to Mitigation Wetland E. The applicant's hydrology analysis of the existing site indicates that runoff from the paved and gravel surfaces of PG&E's Antioch Terminal is the primary contributor of surface discharge to Mitigation Wetland E due to the sandy nature of the existing soils. Following construction, runoff from the project site areas and PG&E's Antioch Terminal generated during small typical storms would also be subject to infiltration within the proposed bioswales and pond. Since the proposed stormwater management plan would route all runoff from PG&E's Antioch Terminal through the detention basin, it will be critical that runoff efficiently pass through the basin without significant losses to infiltration to maintain the hydrologic function of Mitigation Wetland E. With a 24-hour draw down time, shallow treatment depth, elevated orifices, and sandy soils, much of the surface runoff delivered to the pond would be infiltrated into the subsurface.

As proposed, the riser significantly limits flows to the mitigation wetland until the riser overtops (during a 100-year event). For instance, in a 10-year event, the applicant's analysis indicates that flows discharged from the detention basin would be reduced to 0.27 cfs. By comparison, the water quality flow rate for the pond's contributing watershed would be about 1.5 cfs for a relatively low rainfall intensity of 0.2 inch/hour. The proposed pond, with a relatively shallow 0.84 feet treatment depth for the water quality volume, could function more like flow based BMP similar to the bioswales. Given the concern regarding the hydraulic connection to the Mitigation Wetland, Staff recommends that the orifices be lowered to the base of the pond and sized to pass the water quality flow rate for the pond contributing watershed (including portions that pass

through Bioswales #4 & #5) with about 1 foot of depth. This approach would allow for water quality treatment by shallow flow through the vegetated pond base, and pass much of the surface runoff on to Mitigation Wetland E.

Staff is also concerned that the proposed orifice configuration with a number of small orifices located in a single row at the base of the bioswales (or pond), could be subject to clogging as a result of sediment deposition. Staff recommends that the orifices on all of the risers (bioswales and pond) be spaced vertically to accommodate sediment deposition. Ideally, the orifice rows would be spaced vertically 2 to 3 inches on center so that as sediment deposits in the base of the bioswales (or pond), the riser maintains the hydraulic performance. To limit the need for frequent maintenance including sediment removal and reseeding, orifice spacing should also extend vertically above the 1 foot flow depth, to maintain hydraulic performance as the bioswales (and pond) trap sediment.

Monitoring and Adaptive Management

The applicant provided a wetland management plan to the California Department of Fish and Game for Mitigation Wetland E (CH2MHILL, 2010k). In the management plan the applicant committed to an adaptive management strategy to protect the hydraulic function of Mitigation Wetland E. The adaptive management plan includes pre- and post-construction monitoring of the hydrologic conditions in the wetland. If hydrologic impacts are observed during post-construction monitoring, the applicant has indicated that a drainage pipe can be added to Bioswale #1-2 (or the pond) to increase delivery of runoff to the wetland.

The Contra Costa Countywide NPDES Stormwater Permit Amendment requires the County and its municipalities prepare and implement Stormwater Control Plans (SWCP) that are consistent with the Contra Costa Clean Water Program (CCCWP) as authorized by Order No. R5-2010-0029 (CVRWQCB 2010). In addition, the City of Oakley also requires compliance with the NPDES permit and the Stormwater C.3 requirement of the CCCWP. Staff recommends Condition of Certification **SOIL&WATER-1** that requires the project owner to prepare and implement a DESCP. The DESCP shall provide sufficient detail to meet the requirements for a Stormwater Control Plan as required by CCCWP and a Hydrology and Hydraulics Report as required by the City of Oakley. Specific details related to the contributing watershed characteristics, stormwater BMP plan, BMP designs, and sizing shall be clearly presented in a well organized report. Back up calculations shall be provided as appendices to the report. Submission of only back up calculations is not acceptable for Energy Commission, County, and City review. In addition, the Industrial SWPPP required in **SOIL&WATER-5** also requires implementation and maintenance of drainage control BMPs during operations. Staff also recommends Condition of Certification **SOIL&WATER-6** that requires the project owner to prepare and implement a Wetland Monitoring and Adaptive Management Plan as detailed in the applicant's wetland management plan approved by DFG.

Proper implementation and maintenance of the BMPs outlined in approved SWCP, DESCP, and Industrial SWPPP would limit water quality impacts related to increased stormwater runoff and changes in runoff patterns during operations. With the additional efforts recommended by Energy Commission staff to improve the hydraulic performance

of the outlet structures proposed for the bioswales and pond, Energy Commission staff believes that the proposed plans are reasonable at this level of project planning to avoid significant adverse impacts due to increases in stormwater runoff and changes in drainage patterns. Post-construction monitoring and adaptive management will ensure that potential impacts to Mitigation Wetland E would be less than significant.

Flooding Potential

During operations, the OGS site would be comprised of buildings, paved surfaces, and gravel surfaces which would increase stormwater runoff volumes and peak flow rates. The proposed project must limit increases in stormwater discharge from the project site to meet flood control standards and to limit flood related impacts to downstream properties associated with development of the project site. OGS proposes to contain all runoff within Wetland E and other onsite detention facilities with no offsite discharge. For retention facilities without offsite discharge the City of Oakley requires storage of runoff from a 100-year event plus a factor of safety. Contra Costa County directed the applicant to size the detention basin to contain the 100-year storm event without discharge. Additionally, they recommended the applicant evaluate the 100-year +10-year event with an empty basin initial condition.

The applicant provided a revised stormwater drainage design in the Response to Energy Commission staff comments provided at in a technical memorandum (PWA 2010a and CH2MHILL 2010u). The stormwater design calculation package included HEC-HMS analyses to estimate the changes in runoff volumes from the project site between the existing conditions as a vineyard and the proposed conditions during operations of the OGS site. Runoff volumes from a 10-year event would increase from 1.17 acre-feet to 1.98 acre-feet following development. Runoff volumes would increase from 2.79 acre-feet to 4.05 acre-feet in a 100-year event. The applicant utilized the HEC-HMS runoff volume results to demonstrate that the proposed detention basin combined with Wetland E would have adequate capacity to contain the 100-year + 10-year runoff volumes (6.03 acre-feet.

Mitigation Wetland E has a storage capacity of 6.13 acre-feet and the proposed detention basin (pond) would have a storage capacity of about 0.57 acre-feet. Under high stage conditions, the water surface elevation in the wetland and pond would eventually equalize across the connecting culvert to provide storage required for large runoff events. The elevation-area-storage of the equalized pond and wetland is presented in Table 4. The volumetric flood control analysis did not include any storage in the bioswales or account for infiltration, thus assuming that the total site runoff would reach the pond or wetland. The results of the analysis indicate that the pond and wetland can contain the runoff generated by the 100-year + 10-year event at a water surface elevation of about 10.8 feet with about 0.9 foot of freeboard below the 11.7 feet elevation of the low spot in the roadway berm adjacent to the wetland.

Soil & Water Table 4
OGS Stormwater Storage Volume
Mitigation Wetland E and Detention Basin (Pond)

Elevation (feet)	Wetland Area (acres)	Pond Area (acres)	Wetland Storage (acre-feet)	Pond Storage (acre-feet)	Total Storage (acre-feet)
5.0	0.40	-	-	-	-
7.5	0.62	-	1.28	-	1.28
8.5	0.95	0.33	2.06	-	2.06
9.0	1.11	0.35	2.58	0.17	2.75
10.0	1.44	0.41	3.86	0.55	4.41
11.0	1.55	0.48	5.36	0.99	6.35
11.5	1.60	0.51	6.15	1.24	7.39

Taken from CH2MHILL 2010u

Staff reviewed the applicant's analysis and believes that the proposed stormwater storage facilities would capture and retain all runoff from the project site. The volumetric capacity analysis indicates that the wetland and detention basin have sufficient capacity to contain all of the runoff generated from the OGS site for a 100-year + 10-year storm event to meet the requirements of Contra Costa County and the City of Oakley. The assumption that all runoff would ultimately be discharged to the proposed detention basin and Wetland E is conservative for flood control purposes. In reality, some runoff would be captured and infiltrated within the bioswales reducing the total runoff delivered to the Pond and Wetland E. The applicant has indicated that the existing culvert connection between the parking lot to the north and Wetland E would be removed to eliminate this source of runoff to the wetland.

The project site is located in Zone X as defined by the Federal Emergency Management Agency (FEMA). This zone is not within the 100-year floodplain and is outside the 500-year floodplain (AFC, 2009). With the combined storage provided by the proposed pond and Mitigation Wetland E, the OGS site would not discharge stormwater generated by a 100-year plus rainfall event during operations and would not increase flooding potential in the vicinity of the site.

Staff recommends Condition of Certification **SOIL&WATER-1** that requires the project owner to prepare and implement a DESCP. The DESCP shall provide sufficient detail to meet the requirements for a Stormwater Control Plan as required by CCCWP and a Hydrology and Hydraulics Report as required by the City of Oakley. The plan should included specific details related to the contributing watershed characteristics, stormwater BMP plan, BMP designs, and sizing for flood control shall be clearly presented in a well organized report. This report should specifically document the 10-year, 100-year, and 100-year + 10-year runoff events for the OGS site and assess the impacts to the onsite storm drain system and mitigation wetland. The City of Oakley and Contra Costa County would provide review and comment on the onsite stormwater facilities and may request additional analyses as part of the final design. Staff recommends that the applicant conduct a hydraulic analysis of the detention pond outlet

structure and the connection to the wetland to ensure that the system will perform hydraulically as anticipated.

Tsunami and Seiche

Tsunamis are waves typically generated offshore or within large bodies of water during a subaqueous fault rupture or subaqueous landslide event. Seiches are waves generated within a large body of water caused by the horizontal movement of an earthquake. Because of the proximity of the project site to San Joaquin River just upstream of Suisun Bay and San Francisco Bay, there is a potential for the project site to be impacted by a tsunami or seiche from the occurrence of a major earthquake.

Tsunami

A tsunami is a series of seismic sea waves caused by sea-bottom deformations that are associated with earthquakes, landslides, or volcanic activity beneath the ocean floor. Local tsunamis can be caused by significant vertical displacement along offshore faults and subaqueous landslides. Earthquake faults in the San Francisco Bay area that could generate a tsunami include the San Andreas, San Gregorio, and Point Reyes faults (CCSF 2008).

The majority of earthquake faults transecting the San Francisco Bay area are strike-slip faults; therefore, a tsunami is not expected to be a major threat as a result of a regional earthquake. The primary tsunami threat along the central California coast is from distant earthquakes along subduction zones elsewhere in the Pacific basin. It is estimated that the 100-year tsunami wave height at the Golden Gate Bridge would be 8.2 feet but would dissipate to approximately 4-feet as it moved eastward into San Pablo Bay. The wave height would propagate outward as it flows east through the Suisun Bay where the remaining wave would dissipate as it flowed into the low lying areas of Suisun Marsh west of the OGS site. The OGS site would not be impacted by the 100-year tsunami due to its location well east of the Golden Gate Bridge and the many embayments the wave would flow through prior to reaching the site (CCSF 2008).

Seiche

Seiches occur in enclosed water bodies as a result of ground shaking primarily due to earthquakes. The enclosed water body nearest to the OGS site is the Suisun Bay. A seiche originating in Suisun Bay would have to travel up stream to the proposed OGS site and would flood the low-lying areas of Suisun Marsh causing the seiche to rapidly dissipate prior to reaching the proposed OGS site.

Sea Level Rise

The San Joaquin River is 0.6 miles north of the proposed OGS site, which is located within the estuarine transition zone between the Suisun Bay and the San Joaquin River. The lowest finished grade elevations at the OGS site adjacent to the river would be about 12-feet msl, which would be approximately 5 feet above the BFE for the 100-year storm. Since there is the potential that sea level rise due to climate change could inundate portions of the site, staff has reviewed the sea level rise estimates for California.

According to a 2008 draft report (report) from the California Climate Change Center, the rise in sea level would range from 30 to 45 cm (12 to 18 inches) along the California coast by 2050. The report recommends the use of 16 inches of sea level rise through 2050. The report also projects an increased rate of extreme high sea level events that would occur during high tides accompanied by winter flood flows (CCCC 2009).

Based on a maximum projected sea level rise of approximately 18 inches by 2050, staff finds that the finished grade elevation of about 12-feet msl would prevent flooding of the proposed OGS site due to the potential of sea level rise in combination with high tides and winter flood flows. Additionally, staff is confident the project owner would take proactive steps to protect the OGS in the event flood flows or the sea level begin to rise above the BFE of 7 feet msl as shown on the 1987 Flood Insurance Rate Map (FEMA, 1987).

Operations Water Supply

The applicant has indicated that OGS would use up to 250 afy of water for all project water needs during operations. The applicant proposes to utilize fresh, potable water to provide the project's water supply. DWD confirmed that they have the ability and can meet the OGS facility demand in a June 2009 will serve letter (OG 2009a). OGS proposes to obtain potable water from DWD via a connection to an existing 24-inch water main that runs through the project site. Operational fresh water use is estimated to average about 240 acre-feet per year (AFY) with about 124 afy dedicated to evaporative cooling and inlet air cooling based on 8,449 hours of operation.

OGS has committed to conversion to a recycled water supply when it becomes available. The proposed water treatment building has been sized to accommodate the potential future installation of a microfiltration or ultrafiltration system to provide additional treatment of the recycled water supply upstream of the RO system (CH2MHILL 2010c). Recycled water would be used to supply the RO system, landscape irrigation, plant washdown water, combustion turbine inlet air coolers, and evaporative cooler. When OGS converts to recycled water supply, peak water demand would be expected to increase by about 11 percent. Operational use of recycled water would increase to a maximum of about 409 gpm or about 0.59 MGD and an average of about 105 gpm or about 247 AFY.

Ironhouse Sanitary District (ISD) is currently constructing a new wastewater treatment plan approximately 2.5 miles from the OGS site. The new plant will provide tertiary treated recycled water in close proximity to OGS. At this time, ISD is planning to complete construction of the new wastewater treatment plant in October 2011 with an initial dry weather flow of about 2.64 MGD. ISD developed an East County Industrial Recycled Water Plan in conjunction with other wastewater agencies including Delta Diablo Sanitation District, Central Contra Costa Sanitary District, Contra Costa Water Agency, the City of Pittsburg, and the City of Antioch to provide recycled water to a number of potential industrial users in the vicinity of the OGS site. ISD considered a 3.6 mile long, 14-inch diameter recycled water pipeline from ISD's new wastewater treatment plant to industrial users on Wilber Avenue passing by the OGS site along Bridgehead Road. The proposed recycled water supply pipeline has gone through preliminary planning by ISD, however, construction of the proposed recycled water pipeline is not currently scheduled (CH2MHILL 2010c).

Based on the availability of an adequate, tertiary treated, recycled water supply within close proximity of the OGS site, Energy Commission staff believes that use of recycled water would be technically and economically feasible. See the **ALTERNATIVES** section for a complete analysis of the recycled water sources.

The majority of DWD's supply is untreated water purchased from the Contra Costa Water District (CCWD) through the United States Bureau of Reclamation (USBR) Central Valley Project (CVP) which relies on the Sacramento-San Joaquin Delta (DWD, 2005). DWD also uses local groundwater to supply a portion (less than 20 percent) of its supply (DWD, 2005). DWD delivered about 5,250 acre-feet in 2004. Based on 2005 growth projections, DWD projects to deliver about 7,100 acre-feet in 2010 and 9,100 acre-feet in 2015. OGS water usage would represent 3-5 percent of DWD's total water deliveries. However, DWD's 2005 Urban Water Management Plan indicates that DWD is relying on increased water purchases of CVP water from CCWD to provide much of the additional supplies required to meet future demand including that of OGS.

The CVP has experienced frequent reductions in water allocations to water supply districts due to regulatory restrictions during drought periods. During periods of limited allocations, water users serviced by CVP contractors including DWD are required to limit their use of water. South of the Delta, agricultural users have had full allocations only one of the past ten years and have seen allocations cut to 40-75 percent in seven of ten years and cut to 10 percent in 2009. Urban users have only seen full allocations three of the past ten years and had their allocations cut to below 78 percent in four of the past ten years. Water supplies derived from the CVP project are significantly limited. As new users take up a portion of the limited water available, the potential for shortages and limitations increases and other users would need to further limit water usage to make up for the additional supply requirements.

In Resolution 2010-0039, the State Water Resources Control Board has recently determined that the Sacramento-San Joaquin Delta is in ecological crisis and that recent Delta flows have been inadequate to support aquatic habitat for endangered native fish species (SWRCB 2010). Returns of salmon on the Sacramento River have declined by 97 percent since 2002, reaching critical levels that required the suspension of commercial and recreational fishing in 2008 and 2009 (PMFC, 2010). In response, the SWRCB has released new flow criteria for the Delta designed to protect federal and state listed endangered species that depend upon aquatic habitat in the Delta for survival (SWRCB 2010). These criteria indicate that the Delta outflows should be increased to about 75% of natural unimpaired flows from November through June to support endangered fish species (SWRCB 2010). By comparison, during drought years in the early 1990s and early 2000s, outflows have been reduced to about 30% of natural flows (SWRCB 2010). Thus, the SWRCB is recommending that Delta diversions would be cut by about 65 percent from the historic levels during drought years.

The SWRCB indicated that the determinations in Resolution 2010-0039 did not have regulatory or adjudicatory effect (SWRCB 2010). When the SWRCB develops Delta flow objectives with regulatory effect, it must ensure the reasonable protection of beneficial uses, which may entail balancing of competing beneficial uses of water, including municipal and industrial uses, agricultural uses, and other environmental uses (SWRCB 2010). The SWRCB will evaluate the effect of any changes in flow objectives on the

environment of the Delta, the upgradient watersheds, and the areas where Delta water is used, as well as, an evaluation of economic impacts (SWRCB 2010). The SWRCB indicated that it may amend the terms and conditions of water right permits and licenses to impose further limitations on the diversion and use of water by water rights holders to protect the Delta or to meet water quality and flow objectives in Water Quality Control Plans it has adopted (SWRCB 2010). The SWRCB also indicated that it may impose restrictions in diversions by the CVP and SWP when the Department of Water Resources and US Bureau of Reclamation seeks to change points of diversion for the CVP and SWP (SWRCB 2010).

As new Delta flow criteria or other regulatory means are adopted in the future to protect the environment within the Delta, CVP allocations may significantly decline in the future to levels below the allocation restrictions seen over the past 10 years. As CVP restrictions on water allocations to municipal, industrial and agricultural become more frequent and significant due to pumping restrictions in the Delta, Staff believes that other existing water users may be impacted by the proposed use of fresh water for OGS operations.

Staff is recommending Condition of Certification **SOIL&WATER-4** to limit the OGS facility to maximum water use of 250 acre-feet per year of fresh water supplied by DWD for up to three years following commencement of operations. Condition of Certification **SOIL&WATER-4** requires OGS to convert to recycled water supplied by the new ISD wastewater treatment plant within three years of project operations. Recycled water use is limited to 280 AFY. Up to 25 AFY of fresh water supplied by DWD would be allowed as a backup water supply. Condition of Certification **SOIL&WATER-4** requires the project owner to install metering devices on all water supply pipelines and submit monthly water usage data to confirm the site is in compliance with the annual water use limit.

Conversion to the recycled water supply would require a project amendment reviewing the proposed pipeline and recycled water treatment system (including an Engineer's Report and Duel Plumbing Plan). Condition of Certification **SOIL&WATER-8** requires the project owner to gain CEC approval of a project amendment for conversion to recycled water use.

Project Wastewater

The wastewater generated by the OGS project during operations would include both industrial wastewater and stormwater runoff from the power block area. The primary sources of wastewater would be the reject from the RO system, blowdown condensate, and system wash waters. Stormwater runoff from the power block area would be directed to an oil/water separator prior to being discharged to the sanitary sewer. These wastewater streams would be directed to the Ironhouse Sanitation District's (ISD) wastewater treatment facility. The applicant has received a will serve letter from ISD indicating that they will have capacity to accept and treat a wastewater flow up to 200 gallons per minute from the OGS following completion of the ISD plant expansion. This is sufficient to meet the anticipated average (68 gpm) and peak (159 gpm) wastewater flows including sanitary wastewater from OGS while using freshwater supplied by DWD. When the project switches to a recycled water supply, wastewater discharge would increase by about 15 percent with an average discharge of 78 gpm and a peak of about

200 gpm. Wastewater would be delivered to ISD's existing gravity sanitary sewer system via a new 0.44-mile long sanitary sewer force main.

When the project adopts a recycled water supply, the wastewater discharge stream may exceed ISD's wastewater discharge limits for TDS, electrical conductivity, and select metals. The applicant has indicated that a high-TDS wastewater discharge line routing wastewater to Pittsburg (where wastewater discharge limitations allow higher levels of TDS) would be required to switch the project to a recycled water supply. Staff believes that the project could meet ISD's wastewater discharge limitations using onsite treatment to treat the wastewater stream to meet the ISD's wastewater discharge limitations. Another possible option would be implementation of a Zero Liquid Discharge (ZLD) system to treat project wastewater as required by Energy Commission policy. Alternatively, OGS could work with ISD to fund the District's salinity reduction program to help reduce salinity from other dischargers in the ISD service area. ISD's salinity reduction program includes buy out of water softeners to limit salinity inputs to ISD's wastewater treatment plant.

Based on the will serve letter from ISD, Energy Commission staff believes that there would be sufficient treatment capacity within the planned expansion of the ISD treatment facility to handle the industrial wastewater and stormwater generated by the proposed project. Additionally, Energy Commission staff believes that by meeting the requirements of the existing industrial waste discharge requirements set forth for the ISD wastewater treatment plant (or through an alternative salinity reduction program), the impact of the proposed project on existing wastewater treatment systems and water quality downstream of the site would be less than significant.

Staff recommends Condition of Certification **SOIL&WATER-7** requiring OGS to limit wastewater discharge to a maximum of 200 gpm and meet the wastewater discharge requirements at the ISD wastewater treatment plant as required by the Central Valley Regional Water Quality Control Board.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts consist of impacts that may occur as a result of the proposed project in combination with impacts from other past, present and reasonably foreseeable future projects. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

Surface Water / Stormwater

The OGS site is outside of the 100-year floodplain and stormwater runoff from the OGS site would be retained onsite. OGS would not increase flood flows or alter the water quality within the San Joaquin River and no significant cumulative impacts to surface water resources are expected.

Groundwater

OGS would utilize freshwater supplied by DWD for construction and up to three years of operation. DWD water supplies include a blend of surface water supplied by the CVP and locally pumped groundwater. DWD monitors operation of the local groundwater supply well related to groundwater quality and quantity.

OGS would utilize about 3 to 5 percent of DWD's total water supply. No significant cumulative impacts related to groundwater quantity or quality are anticipated as a result of OGS.

Project Water Supply

The proposed Condition of Certification **SOIL&WATER-4** would require the project to utilize recycled water within three years of project operations. Use of a recycled water supply would limit withdrawls of freshwater from the Sacramento-San Joaquin Delta. Freshwater use would be limited to a maximum of 846 acre-feet during construction and the first three years of project operations. Within three years of project operation, OGS is required to switch to a recycled water supply.

The use of recycled water for ongoing plant operations would limit OGS's contribution to the existing cumulative impact to the ecology and other users of water supply from the Sacramento-San Joaquin Delta.

Project Wastewater

Wastewater including cooling tower blowdown and stormwater power block with be routed to Ironhouse Sanitary District's wastewater treatment plant under an existing Industrial Wastewater Discharge Permit. Ironhouse Sanitary District has indicated that it has sufficient capacity to treat wastewater discharged from OGS and no significant cumulative impacts related to wastewater discharge are anticipated as a result of OGS.

PUBLIC AND AGENCY COMMENTS

City of Oakley (April 2005)
Energy Commission staff reviewed the letter provided by the City of Oakley and included the requirements pertinent to soil and water resources outlined in City's recommended conditions of approval within the recommended Conditions of Certification. Appendix A – Part B includes a table with Energy Commission staff's response to all of the City's recommended Conditions.

COMPLIANCE WITH LORS

Energy Commission staff reviewed the proposed project to determine if the project would adhere to the requirements of LORS and state and local policies related to soils and water resources.

Water Supply

Of particular concern to Energy Commission staff was OGS's proposed water supply and determination that the proposed water supply met state laws and policies. Under the California Constitution (Section 2, Article X), California Water Code encourages the conservation of water resources and the maximum reuse of wastewater particularly in areas of limited supply. The Water Code (Sections 13550 and 13552.6) indicates that use of potable water for industrial uses including power plant cooling is a waste and unreasonable use of water if sources of recycled water are available.

SWRCB Resolutions 75-58 and 2009-0011 supports and promotes the use of recycled water and encourages the substitution of recycled water for potable sources to the extent possible. The SWRCB indicates that the lowest quality cooling water reasonably available from technical and economic standpoint should be utilized for industrial processes including evaporative cooling processes. The Energy Commission in its 2003 IEPR adopted a policy pursuant to SWCRB Resolution 75-58, indicating that approval of fresh water sources for power plant cooling would only be acceptable if alternative water supply sources are economically unsound or environmentally undesirable. The 2003 IEPR also requires the use of Zero Liquid Discharge technologies to limit waste water discharge from power plants unless it is shown to be economically unsound or environmentally undesirable.

OGS has proposed the use of potable water supplied by DWD until recycled water supplied by ISD becomes available. More than half of OGS's estimated annual water use is dedicated to power plant cooling through use for inlet air cooling and evaporative fluid cooling. Tertiary treated recycled water from ISD will become available to OGS beginning in October 2011. This tertiary treated source will be available in adequate volumes and with sufficient quality to be OGS's primary water supply.

ISD's new wastewater tertiary treatment plant is located about 2.5 miles from the OGS site. ISD has identified a 3.6-mile pipeline route that limits impacts to existing neighborhoods and avoids the Atchison, Topeka and Sante Fe railroad right of way. The proposed pipeline route would travel along Main Street and pass by the OGS site on Bridgehead Road. OGS's proposed 0.44-mile sanitary sewer force main has a similar alignment. An alternative, more direct alignment would be possible passing through the OGS site and laydown area. Given the close proximity to the OGS site, Energy Commission staff believe that recycled water is readily available, technically, and economically feasible as the primary water supply for OGS.

One constraint identified by OGS for conversion to recycled water, would be the creation of a wastewater stream with a high salinity. OGS indicated that construction of a 7-mile long high-TDS wastewater line to allow discharge of wastewater to the Delta Diablo Wastewater Treatment plant was required for wastewater disposal. However, Energy Commission staff believes that there may be other lower cost options. For instance, OGS could provide additional treatment of the wastewater stream to remove excess salts for offsite disposal. OGS could also implement a ZLD system to meet existing Energy Commission policies. Finally, OGS could work with ISD to help fund their salt reduction program aimed at reducing salt loads in the service area through water softener buyouts. Staff does not believe that the wastewater quality issue would

present a technologic or economic feasibility issue significant enough to prevent the use of recycled water.

Thus, Energy Commission staff has included requirements to prepare a project amendment for use of recycled water and to convert to recycled water provided by ISD within three years of operation in Conditions of Certification **SOIL&WATER-8** and **-4.** The three year "bridge" period provides OGS with adequate time to 1) develop plans for a recycled water pipeline and onsite treatment of recycled water and waste water, 2) document their proposed plans in a project amendment, 3) gain CEC approval of the project amendment, and 4) implement the recycled water pipeline and onsite treatment.

Based on Energy Commission staff's analysis and review, OGS would comply with all applicable LORS associated with soil and water resources, including:

- The Clean Water Act through the authority granted to the State to enforce coverage under the NPDES by the Central Valley Regional Water Quality Control Board through the requirements for the preparation and implementation of the SWPPPs, and Drainage Erosion and Sedimentation Control Plan which would include the requirements of the Contra Costa Clean Water Program's Stormwater Control Plan;
- The Clean Water Act through the discharge of wastewater under the requirements of Ironhouse Sanitary District's Wastewater Discharge Requirements set forth by the Central Valley Regional Water Quality Control Board.
- The Resource Conservation Recovery Act of 1976 by the proper handling and discharge of wastewater and potentially contaminated soils;
- The Porter-Cologne Water Quality Control Act through the implementation of the DESCP and SWPPP;
- The California Safe Drinking Water and Toxic Enforcement Act by establishing secondary containment in chemical storage areas;
- Title 23 of the California Code of Regulations requiring the Regional Board to specify conditions for protection of water quality as applicable: In the case of the OGS, the project would be permitted under the General NPDES Permits for Discharge of Stormwater associated with both construction and industrial activity;
- The Energy Commission's 2003 Integrated Energy Policy Report and SWRCB Resolution 75-58, by using hybrid cooling technology and through the use of recycled water for plant operations within three years of commencing operations.
- The City of Oakley's standard conditions of approval related to stormwater and drainage and NPDES compliance through the development and implementation of a DESCP that addresses Contra Costa County Clean Water Program's requirements for stormwater treatment and the City of Oakley requirements for management of 10-year and 100-year rainfall/runoff events.

CONCLUSIONS

Energy Commission staff has not identified any immitigable potentially significant impacts to Soil and Water Resources for OGS and believes that OGS would comply with all applicable Laws, Ordinances, Regulations and Standards (LORS) provided the proposed conditions of certification are implemented.

Energy Commission staff concludes the following:

- Implementation of Best Management Practices during OGS construction and operation in accordance with effective Storm Water Pollution Prevention Plans, a Drainage Erosion and Sediment Control Plan, would avoid significant adverse effects that could otherwise result in significant transport of sediments or contaminants to Mitigation Wetland E by wind or water erosion.
- Staff has recommended additional measures and minor adjustments to the applicant's proposed erosion control and stormwater quality Best Management Practices to help ensure that potential impacts to existing wetlands adjacent to the project site are reduced to less than significant levels.
- The project's use of recycled water within three years of commencing operations would limit freshwater use in the region, limit potentially significant adverse impacts on current or future users of the water supply, and provide consistency with the Energy Commission and State Water Resources Control Board policies on the use of fresh inland water for industrial uses and power plant cooling .
- The project would not be located within the 100-year flood plain, and would not increase flood conditions downstream of the project.
- The discharge of wastewater under the conditions stipulated in the Ironhouse Sanitary District's Wastewater Discharge Permit (or through implementation of a salt reduction program) would meet the Central Valley Regional Water Quality Control Board's standards.

Where the potential for impacts has been identified, staff is proposing mitigation measures to reduce the impact to less than significant. The mitigation measures, as well as specifications for LORS conformance, are included as conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

SOIL&WATER-1: Prior to site mobilization, the project owner shall obtain compliance project manager (CPM) approval for a site-specific Drainage, Erosion and Sedimentation Control Plan / Stormwater Control Plan (DESCP / SWCP) that ensures protection of water quality and soil resources of the project site for both the construction and operational phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, meet local requirements (including Contra Costa County Clean Water requirements), and identify all monitoring and maintenance activities. The plan shall be presented in an organized report format with clear descriptions of the proposed stormwater management plans,

design and intended function of major stormwater control and water quality treatment Best Management Practices, and flood control facilities. The plan shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1** and may incorporate by reference any SWPPP developed in conjunction with any NPDES permit.

The DESCP shall contain elements 1 through 11 below outlining site management activities and erosion- and sediment-control and water quality treatment BMPs to be implemented during site mobilization, excavation, construction, and post construction (operating) activities.

1. **Vicinity Map** – A map(s) at a minimum scale 1”=100’ shall be provided indicating the location of all project elements (construction site, laydown area, pipelines) with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

2. **Site Delineation** – All areas subject to soil disturbance for the OGS project (project site, laydown and parking area, and any other project elements) shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

3. **Watercourses and Critical Areas** – The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. It shall indicate the proximity of those features to the OGS construction, laydown and parking areas.

4. **Drainage Map** – The DESCP shall provide a topographic site map(s) at a minimum scale of 1”=100’ showing existing, interim, and proposed drainage swales and drainage systems and drainage-area boundaries. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours shall be extended off site for a minimum distance of 100 feet.

5. **Narrative of Project Site Drainage** – The DESCP shall include a narrative of the drainage measures necessary to protect the site and potentially affected soil and water resources within the drainage(s) on and downstream of the site. The narrative shall include the summary pages from the hydraulic analysis prepared by a professional engineer and erosion control specialist. The narrative shall state the watershed size(s) in acres including a breakdown of surface treatments (paved, buildings, gravel, landscape, etc) that was used in the sizing of drainage features. The hydraulic analysis shall be used to support the selection and sizing of BMPs and structural controls to divert off-site and on-site drainage around or through the OGS site and laydown areas.

6. **Clearing and Grading Plans** – The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections, or other means. The

locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography shall be illustrated by tying in proposed contours with existing topography.

7. **Clearing and Grading Narrative** – The DESCP shall include a table with the quantities of material excavated or filled for the site and all project elements (project site, laydown area, transmission and pipeline corridors, roadways, and bridges) whether such excavation or fill is temporary or permanent, and the amount of such material to be imported or exported.

8. **Best Management Practices Plan** – The DESCP shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). The DESCP shall identify appropriate water quality treatment BMPs to target sediment, metals, and hydrocarbons that are numerically sized to meet the requirements of the Contra Costa County Clean Water Program. The proposed BMPs shall include three Bioswales around the site perimeter and an extended detention basin at the western boundary of the project site. Outlet structures and BMP designs shall allow low flows to pass through the BMPs to Mitigation Wetland E to maintain the hydraulic function of the Wetland including passing the Water Quality Flow Rate with 1 foot of flow depth. Orifices within each outlet structure shall be spaced vertically to maintain hydraulic function as sediment deposits within the base of the structure. Outlet structures shall incorporate filter fencing to trap eroded sediments during construction. If necessary, trapped sediments may need to be removed from the Bioswales and detention basin following construction, and the BMPs reseeded.

9. **Best Management Practices Narrative** – The DESCP shall show the location (as identified in 8 above), timing, and maintenance schedule of all erosion- and sediment-control and water quality treatment BMPs to be used prior to initial grading, during all project element (site, pipelines) excavations and construction, final grading/stabilization, and operation. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule shall include post-construction maintenance of structural-control BMPs, or a statement indicating when such information will be available.

10. **Soil Stockpile BMP Plan** – The DESCP shall include specific BMPs to stabilize soil stockpiles and capture eroded sediments to protect adjacent wetlands. The BMPs shall include appropriately spaced fiber rolls, geotextile erosion control fabrics, hydroseeding with a local native grass mix, watering as necessary to maintain a healthy stand of grass, and a regular monitoring and maintenance plan for a period of at least two years. Monitoring and maintenance shall continue until the all stockpiles are fully stabilized. If maintenance responsibilities for the stockpiles are passed to DuPont prior to completion of the two year maintenance period, the project

shall provide a commitment from DuPont to maintain the stockpiles in accordance with the Soil Stockpile BMP Plan.

11. **Hydrology and Hydraulic Reporting** – The DESCP shall include final hydrology and hydraulic calculations demonstrating that the proposed stormwater management plans have the capacity to convey, capture, and control runoff from a 10-year, 100-year, and 10+100-year events as required by Contra Costa County and the City of Oakley. A 1-inch rainfall event shall also be analyzed to demonstrate that the delivery of runoff to Mitigation Wetland E would not be impacted during small frequent rainfall events. Losses due to infiltration in sandy soils (Hydrologic Soil Group A) within all bioswales and the proposed detention pond shall be estimated and accounted for in analyses of the 1-inch rainfall event.

Verification: No later than 90 days prior to start of site mobilization, the project owner shall submit a copy of the DESCP for construction activity and operations to the City of Oakley, Contra Costa Clean Water Program, and the Central Valley RWQCB (CV RWQCB) for review and comment. No later than 60 days prior to start of site mobilization, the project owner shall submit the DESCP with the City's, CCCWP and CV RWQCB's comments to the CPM for review and approval. The CPM shall consider comments by the City, CCCWP and CV RWQCB before approval of the final DESCP. The DESCP shall be consistent with the grading and drainage plan as required by condition of certification **CIVIL-1**, and relevant portions of the DESCP shall clearly show approval by the chief building official. During construction, the project owner shall provide an analysis in the monthly compliance report on the effectiveness of the drainage, erosion and sediment control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall provide in the annual compliance report information on the results of monitoring and maintenance activities.

SOIL&WATER-2: The project owner shall comply with the requirements of the general National Pollutant Discharge Elimination System (NPDES) permit for discharge of stormwater associated with construction activity (NPDES Permit No. CAS083313). The project owner shall develop and implement a construction stormwater pollution prevention plan (construction SWPPP) for the construction of the OGS site, laydown area, and all linear facilities.

Verification: The project owner shall submit to the CPM a copy of the construction SWPPP prior to site mobilization and retain a copy on site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the CV RWACB regarding the NPDES permit for the discharge of stormwater associated with construction activity within 10 days of its receipt or submittal. Copies of correspondence shall include the notice of intent sent to the State Water Resources Control Board, and the board's confirmation letter indicating receipt and acceptance of the notice of intent.

SOIL&WATER-3: If groundwater is encountered during construction or operation of the OGS, the project owner shall comply with the requirements of the Central Valley RWQCB Order NO. R5-2008-0081 for Waste Discharge Requirements for Dewatering and Other Low Threat Discharges to Surface Waters.

Verification: Prior to any groundwater discharge or dewatering activities, the project owner shall submit a complete Notice of Intent (NOI) to obtain coverage under Central Valley RWQCB Order No. R5-2008-0081. The project owner shall submit copies to the CPM of all correspondence between the project owner and the Central Valley RWQCB regarding Order No. R5-2008-0081 within 10 days of its receipt or submittal. This information shall include a copy of the NOI for compliance with Order No. R5-2008-0081 or other discharge requirements determined by the Central Valley RWQCB.

SOIL&WATER-4: For a maximum period of three (3) years following commencement of project operations, freshwater supplied by the potable connection with Delta Diablo Water District shall be used as the primary water supply for project operation for process, sanitary, and landscape irrigation purposes. Freshwater use shall not exceed the annual water-use limit of 250 acre-feet per year during the three year bridge period.

Within three (3) years following commencement of project operations, the primary water supply for project operations including all process and landscape irrigation shall be exclusively recycled water provided by Ironhouse Sanitary District (ISD). Use of recycled water shall be limited to 280 acre-feet per year (or as determined in review of the project amendment). After the project switches to the primary recycled water supply, the backup water supply for project operation for process and landscape irrigation shall be freshwater provided by the potable connection with DWD. The use of freshwater from DWD shall be limited to 25 acre-feet per year. The Project owner shall notify the CPM of any disruptions in the primary recycled water supply exceeding 24 hours. For any planned disruptions in the primary recycled water supply that will exceed 7 days, the Project owner shall obtain CPM approval on a water supply disruption plan that outlines the reasons and duration for the planned disruption, and the volume of secondary water that will be utilized during the planned disruption. Sanitary water shall be supplied by the potable connection with DWD. Use of groundwater other than that provided by DWD as a part of their supply is prohibited for operational uses.

Prior to using potable and recycled water for construction or operational uses, the project owner shall install and maintain metering devices as part of the water supply and distribution systems to monitor and record, in gallons per day, the total volume(s) of water supplied to OGS from DWD. Those metering devices shall be operational for the life of the project.

The project owner shall monitor and record the total water used on a monthly basis including recycled water from ISD and potable water from DWD. For calculating the annual water use, the term “year” will correspond to the date established for the annual compliance report (ACR) submittal. For the first year of operation, the project owner shall prepare an annual Water Use Summary, which will include the monthly range and monthly average of daily potable and recycled water usage in gallons per day, and total water used by the project on a monthly and annual basis in acre-feet. For subsequent years, the annual Water Use Summary shall also include the yearly range and yearly

average water use by the project. The annual Water Use Summary shall be submitted to the CPM as part of the ACR.

Verification: At least sixty (60) days prior to commercial operation of OGS, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the water supply and distribution systems. When the metering devices are serviced, tested and calibrated, the project owner shall provide a report summarizing these activities in the next annual compliance report. The project owner, in the annual compliance report, shall provide a Water Use Summary that states the source and quantity of potable and recycled water used on a monthly basis and on an annual basis in units of acre-feet. Prior annual water use including yearly range and yearly average shall be reported in subsequent annual compliance reports (ACR).

The CPM shall verify that any planned disruptions in the recycled water supply are short in duration and do not result in total fresh water use exceeding the 25 AFY limit. In the ACR, the project owner shall provide a discussion of any disruptions in the primary recycled water supply exceeding 24 hours including the cause of the disruption and all efforts to address the disruption.

SOIL&WATER-5: The project owner shall comply with the requirements of the general NPDES permit for discharges of stormwater associated with industrial activity. The project owner shall develop and implement an industrial stormwater pollution prevention plan for the operation of OGS project.

Verification: The project owner shall submit to the CPM a copy of the industrial SWPPP for operation of the OGS project prior to commercial operation, and shall retain a copy on site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the CV RWQCB regarding the general NPDES permit for discharge of stormwater associated with industrial activity within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the State Water Resources Control Board.

SOIL&WATER-6: Upon project approval, the project owner shall develop and implement a Wetland Monitoring and Adaptive Management Plan for Mitigation Wetland E. The Plan shall include:

1. Monitoring of water levels within Mitigation Wetland E on a daily basis for at least one year prior to construction, during construction, and during operations. Water quality should be tested quarterly. Rainy seasons samples shall be collected following rainfall events (0.5 inch or greater). The plan should describe the monitoring methods proposed.

2. The proposed planting design for the replacement of non-native trees, plantings of native herb and shrub species, and the control of non-native, invasive plant species.

3. Longterm management and maintenance requirements over the life of the project.

4. Contingency plans to address changes in water delivery or water quality impacts to Mitigation Wetland E.

5. Identify the responsible parties and funding source(s) for the implementation of the Monitoring and Adaptive Management Plan for the life of the project.

Verification: No later than 90 days following project approval, the project owner shall submit a copy of the Mitigation Wetland E Monitoring and Adaptive Management Plan to the California Department of Fish and Game (DFG) and the Central Valley RWQCB (CV RWQCB) for review and comment. No later than 120 days following project approval, the project owner shall submit the Mitigation Wetland E Monitoring and Adaptive Management Plan with the DFG's and the CV RWQCB's comments to the CPM for review and approval. The CPM shall consider comments by the DFG and CV RWQCB before approval of the final Mitigation Wetland E Monitoring and Adaptive Management Plan. The Mitigation Wetland E Monitoring and Adaptive Management Plan shall be implemented prior to construction, including a minimum of one year of pre-construction data collection. During construction, the project owner shall provide an monitoring data in the monthly compliance report on the effectiveness of the drainage, erosion and sediment control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall provide in the annual compliance report information on the results of monitoring and maintenance activities. The project owner shall submit copies to the CPM of all correspondence between the project owner and DFG and/or the CV RWQCB regarding the Monitoring and Adaptive Management of Mitigation Wetland E.

SOIL&WATER-7: The project owner shall limit wastewater discharge to a maximum of 200-gpm and comply with the Ironhouse Sanitary District's Wastewater Discharge Requirements stipulated under Central Valley Regional Water Quality Control Board Order Number R5-2008-0057 NPDES Number CA0085260. The project owner shall develop and implement a Wastewater Discharge Sampling and Analysis Plan to demonstrate compliance with the Wastewater Discharge Requirements. The plan shall identify sampling locations, frequency, and methods, and identify appropriate water quality analyses to be performed by a state-certified analytical laboratory.

Verification: No later than 90 days prior to operation, the project owner shall submit to the Ironhouse Sanitary District a copy of the Wastewater Discharge Sampling and Analysis Plan for review and comment. No later than 60 days prior to operation, the project owner shall submit the Wastewater Discharge Sampling and Analysis Plan with the Ironhouse Sanitary District's comments to the CPM for review and approval. The CPM shall consider Ironhouse Sanitary District's comments before approval of the final Wastewater Discharge Sampling and Analysis Plan. The project owner shall provide information on the results of sample analysis results for wastewater discharge in the annual compliance report. The project owner shall submit copies to the CPM of all correspondence between the project owner and Ironhouse Sanitation District DFG and/or the CV RWQCB regarding wastewater discharge.

SOIL&WATER-8: The project owner shall gain Energy Commission approval of a recycled water supply project amendment. The project amendment shall provide a project description and environmental analysis for the implementation of the recycled water supply from Ironhouse Sanitary District (ISD). The project amendment should include documentation of the planned

recycled water pipeline, treatment of recycled water and wastewater, wastewater discharge plans, backup water supply plans. The project amendment shall also include a Dual Plumbing Plan and Engineer's Report as required by the California Department of Public Health and Regional Water Quality Control Board.

The amendment should detail how wastewater discharge will meet ISD's wastewater discharge standards. If the project amendment includes implementation of a salinity reduction program, the amendment shall provide details of the program. The program shall be developed by ISD to reduce salt loading within the District sufficient to offset salt loading from OGS above ISD's wastewater discharge limits on a 1:1 per pound of salt basis. The program shall include the methods to compute excess salt loading, methods of salinity reduction, verification of salinity reduction achieved, and rates for salinity reduction.

Verification: No later than 18 months following project approval, the recycled water project amendment shall be submitted to the Energy Commission for review and approval. Within three years of commencing project operations, the project shall operate with a primary recycled water supply.

REFERENCES

CCCC 2009 – California Climate Change Center. Climate Change Scenarios and Sea Level Rise Estimates for the California 2009 Climate Change Scenario Assessment. CEC-500-2009-14F. August 2009.

CCSF 2008 – City and County of San Francisco. *Emergency Response Plan, Tsunami Response Annex*, September 2008.

CCCWP 2008 – Contra Costa Clean Water Program. *Stormwater C.3 Guidebook*, 4th ed. September 2008.

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CH2MHILL 2009a – CH2MHILL/D. Davy (tn 53784). Supplement to the AFC, dated October 12, 2009. Submitted to CEC/Docket Unit on October 20, 2009.

CH2MHILL 2010c – CH2MHILL/D. Davy (tn 55826). Applicant's Response to CEC Staff Data Requests #44-67, dated March, 9, 2010. Submitted to CEC/Docket Unit on March, 9, 2010.

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CIMIS 2010 – California Irrigation Management Information System. Average Monthly ETo. http://wwwcimis.water.ca.gov/cimis/monthlyEToReport.do.

COO 2010a – City of Oakley/R. Willis (tn 56232). City of Oakley Comments, dated April 5, 2010. Submitted to CEC/Docket Unit on April 14, 2010.

CVRWQCB 2008 – Central Valley Regional Water Quality Control Board. Order NO. R5-2008-0081, Waste Discharge Requirements for Dewatering and other Low Threat Discharges to Surface Waters, 2008.

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DWR 2006 – California Department of Water Resources. California's Groundwater Bulletin 118. October 2006.

DWD 2005 – Diablo Water District Urban Water Management Plan. December 2005.

OG 2009a – Oakley Generating Station (tn 52219). Application for Certification for the Contra Costa Generating Station, Volumes 1 and 2, dated June 30, 2009. Submitted to the CEC/Docket Unit on June 30, 2009.

OG 2009b – Oakley Generating Station (tn 52934). Applicant's Data Adequacy Supplement, dated August 24, 2009. Submitted to CEC/Docket Unit on August 24, 2009.

PMFC 2010- Review of 2009 Ocean Salmon Fisheries. Pacific Management Fisheries Council. February 2010.

PWA 2010a – Philip Williams & Assoc./M. Lindley (tn 58124). Comments from Staff on Applicant's Stormwater Management Plan, dated August 17, 2010, Submitted to CEC/Docket Unit on August 19, 2010.

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TRAFFIC AND TRANSPORTATION

Scott Debauche

SUMMARY OF CONCLUSIONS

California Energy Commission (Energy Commission) staff has analyzed the traffic-related information provided in the Application for Certification and other sources to determine the potential for the proposed project, the Oakley Generating Station (OGS) to have adverse traffic- and transportation-related impacts. Staff has also assessed the availability of mitigation measures that could reduce or eliminate the significance of these impacts. Staff concludes that the OGS would not result in unmitigable significant adverse direct or indirect traffic or transportation impacts.

The OGS is a natural gas-fired combined-cycle electrical generating facility rated at a nominal capacity of 624 megawatts (MW), located within Contra Costa County in the city of Oakley. The OGS also includes offsite electrical transmission and sanitary sewer linear facilities. Construction of the OGS will add traffic to local roadways during the construction period. Unmitigated, this short-term increase in traffic would result in significant impacts to the existing traffic load and capacity of the street system. Construction activities could also result in encroachment and damage to public roadways and introduce oversize and overweight vehicles on the local street system. Once the project is operational, minimal daily traffic would be generated and no impact would occur to the local transportation network. If the Energy Commission elects to grant certification for this project, staff is proposing four conditions of certification. These conditions of certification are recommended to prevent significant adverse traffic and transportation-related impacts from project construction and to ensure that the project would comply with all applicable laws, ordinances, regulations, and standards (LORS) pertaining to traffic and transportation. Energy Commission staff concludes that with implementation of proposed Conditions of Certification **TRANS-1** through **TRANS-5**, the OGS would not generate a significant impact under the California Environmental Quality Act (CEQA) guidelines with respect to Appendix G issues, “Transportation and Traffic.”

INTRODUCTION

In the **Traffic and Transportation** section, staff addresses the extent to which the proposed project may affect the traffic and transportation system within the vicinity of the project site. This analysis focuses on whether construction and operation of the OGS would cause traffic and transportation impact(s) under CEQA and whether the project complies with the applicable LORS.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Traffic and Transportation Table 1 provides a general description of adopted federal, state, and local LORS pertaining to traffic and transportation relevant to the proposed project.

Traffic and Transportation Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
Aeronautics and Space Title 14 Code of Federal Regulations (CFR), part 77 Objects Affecting Navigable Airspace (14 CFR 77)	Establishes standards for determining physical obstructions to navigable airspace; sets noticing and hearing requirements; and provides for aeronautical studies to determine the effect of physical obstructions on the safe and efficient use of airspace.
State	
California Vehicle Code (CVC), division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
California Streets and Highway Code, division 1 & 2, chapter 3 & chapter 5.5	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits.
California Street and Highway Code §§117, 660-711	Requires permits from California Department of Transportation (Caltrans) for any roadway encroachment during oversize truck transportation and delivery. Such encroachment permits are also needed for roads that would include construction from new sewer line connections or be crossed by overhead transmission line stringing, as well as for parallel roads where transmission line construction activities would require the use of any public right-of-way (e.g., temporary lane closures).
California Street and Highway Code §§660-711	Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.
Local	
Contra Costa County 2009 Countywide Comprehensive Transportation Plan	The city of Oakley is located within the East County planning area of the Contra Costa County 2009 Countywide Comprehensive Transportation Plan (CTP). As designated in the Contra Costa County 2009 Countywide CTP, multimodal transportation service objectives for the East County planning area indicate the following performance standards: • SR 4 and the SR 4 Bypass: Delay Index should not exceed 2.5 during the AM or PM Peak Period for these facilities; HOV lane utilization should exceed 600 vehicles per lane in the peak direction at peak hour. • Signalized Suburban Arterial Routes: Level of Service D (by Contra Costa County Transportation Authority Level of Service methodology). • All other Signalized Suburban Arterials: Peak hour volume to capacity ratio no worse than 0.85. • Rural Unsignalized Roadways: Level of Service D (by roadway segment). • Traffic Management Plan (TMP) Sites: Roadway segments subject to a TMP may be analyzed using a measure other than Level of Service or V/C during TMP operations.
Contra Costa County Oversize Vehicle Permit	Contra Costa County requires a permit before operating any extra-legal loaded vehicles within the County.
City of Oakley General Plan Circulation Element	• Policy 3.1.1: Strive to maintain Level of Service D as the minimum acceptable service standard for intersections during peak periods (except those facilities identified as Routes of Regional Significance). • Policy 3.1.2: For those facilities identified as Routes of Regional Significance,

	maintain the minimum acceptable service standards specified in the East County Action Plan Final 2000 Update, or future Action Plan updates as adopted.
City of Oakley Long Range Roadway Plan	This Long Range Roadway Plan supports the determination of major roadway improvements that have been incorporated into the General Plan, and summarizes the analysis conducted to ensure that the roads adequately serve Oakley's growth. The Long Range Roadway Plan has adopted Level of Service D, or a volume-to-capacity (V/C) ratio of 0.90, as the threshold of acceptability for signalized intersections. Routes of Regional Significance are subject to special performance standards. The level of service established for a route of regional significance in Oakley is a peak hour Level of Service D at signalized intersections, and a peak hour Level of Service E for any individual movement at unsignalized intersections.
City of Oakley Transportation Permit	The city of Oakley's transportation permit requires approval from the Public Works Department before operating any oversized loads on city roads.

SETTING

The Oakley Generating Station will be located in Contra Costa County near the junction of State Route (SR) 4 and SR 160 in Oakley, CA. The project site is located in the southwestern corner of the existing DuPont property bordered by the San Joaquin River to the north and east, vineyards and the Burlington Northern Santa Fe (BNSF) railroad corridor to the south, and industrial facilities and the SR 160 corridor to the west. The OGS will also require off-site utility service facilities, including electrical transmission line and sanitary sewer connections traveling along adjacent public roadways and existing utility right-of-way (ROW).

CRITICAL ROADS AND FREEWAYS

The transportation network within the project area consists primarily of city arterials, local roadways, and state-maintained freeways. The following describes the main regional and local roadways that would be used for construction and operational related traffic accessing the proposed project site.

Existing Regional and Local Transportation Facilities

State Route 4 / Main Street

SR 4 is an east-west highway that connects Contra Costa County to the San Francisco Bay Area to the west and San Joaquin County to the east. Near the project site, it is called Main Street and joins SR 160 approximately half a mile south of the project site. According to 2007 traffic counts (most recent available) published by Caltrans, the average daily traffic (ADT) on SR 4 in the vicinity of the project site is 39,000 vehicles per day with 5.4% being truck traffic (OG 2009a, p. 5.12-1). It should be noted, however, that a construction effort for Pacific Gas and Electric Company's Gateway Generating Station may have resulted in artificially high traffic count numbers recorded during portions of this time frame (OG 2009a, p. 5.12-1).

State Route 160

SR 160 is a north-south highway that connects Contra Costa County with Sacramento

County via the Antioch Bridge. 2007 ADT on SR 160 near the project site was 12,800 vehicles per day, with truck traffic accounting for approximately 6.5% of all traffic (OG 2009a, p. 5.12-1).

Bridgehead Road

Bridgehead Road is a north-south roadway that provides direct access to the project site. In the vicinity of the project site, it is an undivided two-lane road (OG 2009a, p. 5.12-2). As Caltrans ADT data is unavailable for this roadway segment, the Marsh Landing Generating Station AFC included traffic counts that indicated the average daily traffic in 2007 was approximately 9,800 vehicles per day near Wilbur Avenue (OG 2009a, p. 5.12-2).

Wilbur Avenue

Wilbur Avenue is an east-west roadway that provides access to the project site via Bridgehead Road and is under the city of Antioch's jurisdiction (OG 2009a, p. 5.12-1). Wilbur Avenue is currently a four-lane road near SR 160 ramps (OG 2009a, p. 5.12-2). As Caltrans ADT data is unavailable for this roadway segment, studies conducted for the Marsh Landing Generating Station Application for Certification (AFC) included traffic counts that indicated the average daily traffic in 2007 was approximately 8,800 vehicles per day near the SR 160 ramps (OG 2009a, p. 5.12-2).

Current Roadway Conditions

Level of Service

To quantify the existing baseline traffic conditions, roadways and intersections anticipated to be used by project related traffic were analyzed in the Application for Certification (AFC) to determine existing operating conditions. These roadway segments and intersections comprise the traffic study area. Based on the traffic volumes, turning movement counts, and the existing number of lanes, the roadway segment volume/capacity (V/C) ratios, intersection delay in seconds, and corresponding levels of service (LOS) have been determined for study area roadway segments and intersections.

LOS is a qualitative measure describing operational conditions within a traffic stream. It is used to describe and quantify the congestion level on a particular roadway or intersection and generally describes these conditions in terms of such factors as speed or vehicle movement. **Traffic and Transportation Table 2** summarizes roadway LOS for associated V/C ratios.

Traffic and Transportation Table 2
Level of Service Criteria for Roadways and Intersections

Level of Service	Volume/Capacity	Unsignalized Intersection Delay per Vehicle (seconds)	Signalized Intersection Delay per Vehicle (seconds)	Description
A	0.00 – 0.60	≤10	≤10	Free flow; insignificant delays
B	0.61 – 0.70	>10 and ≤15	>10 and ≤20	Stable operation; minimal delays
C	0.71 – 0.80	>15 and ≤25	>20 and ≤35	Stable operation; acceptable delays
D	0.81 – 0.90	>25 and ≤35	>35 and ≤55	Approaching unstable flow; queues develop rapidly but no excessive delays
E	0.91 – 1.00	>35 and ≤50	>55 and ≤80	Unstable operation; significant delays
F	> 1.00	>50	>80	Forced flow; jammed conditions

Source: OG 2009a, pp. 5.12-9 and 5.12-12

Current Roadway Segment Conditions — LOS

Traffic and Transportation Table 3 summarizes both the existing LOS for locally operated roadway segments; and the morning (7:00 AM to 9:00 AM) and afternoon (4:00 PM to 6:00 PM) peak hour LOS for state operated roadway segments located within the proposed project study area. As shown in **Table 3**, under existing conditions all study area locally operated roadway segments operate at LOS D or better, while state operated roadway segments operate at LOS C or better.

Traffic and Transportation Table 3
Existing[1] Roadway Segment Level of Service Summary

Local Facilities					
Roadway	**Segment**	**ADT**		**LOS**	
Bridgehead Road	Between Shady Haven Trailer Park and Wilbur Ave.	9,500		D or Better	
Wilbur Avenue	Between SR 160 NB and SB ramps	10,600		D or Better	
State Facilities					
Roadway	**Segment**	**AM Peak Hour**		**PM Peak Hour**	
		V/C Ratio	**LOS**	**V/C Ratio**	**LOS**
SR 4 EB	Between Hillcrest Ave. and SR 160 junction	0.58	C	0.63	C
SR 4 WB	Between Hillcrest Ave. and SR 160 junction	0.53	B	0.49	B
SR 160 NB	Between SR 4 East junction and Wilbur Ave.	0.09	A	0.19	A
SR 160 SB	Between SR 4 East junction and Wilbur Ave.	0.16	A	0.14	A
SR 160 NB	Between Wilbur Ave. and Antioch Bridge	0.10	A	0.22	A
SR 160 SB	Between Wilbur Ave. and Antioch Bridge	0.19	A	0.16	A
SR 160 NB	Between Antioch Bridge and SR 12 junction	N/A	B	N/A	C
SR 160 SB	Between Antioch Bridge and SR 12 junction	N/A	C	N/A	B

Source: OG 2009a, p. 5.12-8
Notes: [1] An annual growth factor of 1% was applied to adjust Caltrans traffic counts from 2007 to estimated 2009 levels.
N/A – Data not available
NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound.

Current Intersection Conditions — LOS

Traffic and Transportation Table 4 summarizes the existing AM and PM peak hour LOS for intersections located within the proposed project study area. As shown in **Traffic and Transportation Table 4**, under existing conditions all study area intersections operate at LOS D or better, with the exception of the Main Street/Bridgehead Road intersection, which operates at an unacceptable LOS E during the PM peak hour.

Traffic and Transportation Table 4
Existing (2009) Intersection Level of Service Summary

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (Seconds)	LOS	Delay (Seconds)	LOS
Main St. and SR 160 SB Ramps	Signalized	22	C	24	C
Main St. and SR 160 NB Ramps	Signalized	16	B	32	C
Main St. and Bridgehead Rd.	Signalized	27	C	65	**E**
Wilbur Ave. and SR 160 SB ramps	Unsignalized	13	B	13	B
Wilbur Ave. and SR 160 NB ramps	Unsignalized	15	B	15	B
Wilbur Ave. and Bridgehead Rd.	Unsignalized	30	D	20	C

Source: OG 2009a, p. 5.12-8
Notes: Bold indicates unacceptable LOS.
NB – Northbound; SB – Southbound.

RAILWAYS

The nearest rail line is located approximately 750-feet south of the project site and crosses both Bridgehead Road and SR 160 (OG 2009a, Figure 5.12-2). This rail line is controlled by BNSF and provides commercial rail service to the area, handling 28 daily trains (OG 2009a, p. 5.12-15). Amtrak also operates 8 to 10 passenger trains on the same tracks; with the closest stop in the city of Antioch (OG 2009a, p. 5.12-15). The nearest railroad crossing at Bridgehead Road is a grade-separated crossing (OG 2009a, p. 5.12-15).

BUS TRANSPORTATION

The city of Oakley's 2002 General Plan indicates two primary types of public bus transit service in the city: school bus services and Tri-Delta Transit public bus service. School bus service operates on five routes, while public bus transit operates six routes throughout the city and beyond (OG 2009a, p. 5.12-15). The nearest bus lines to the OGS site are the following two Tri-Delta Transit lines: Rio Vista Delta Breeze Bus Route along SR 160 north of Main Street and the Tri Delta Transit Bus Route along Main Street east of SR 160 (OG 2009a, Figure 5.12-2). These bus lines are located approximately 1,500-feet west and 2,000 feet south of the project site, respectively (OG 2009a, Figure 5.12-2).

BICYCLES AND PEDESTRIANS

No designated bicycle routes exist within the immediate vicinity of the project site and adjacent project area (OG 2009a, Figure 5.12-2). Sidewalks are provided in most of the new Oakley subdivisions, but there are gaps in the pedestrian system, including along Main Street in the proposed project area (OG 2009a, p. 5.12-15).

AIRPORTS

The nearest airport to the proposed project site is Funny Farm Airport, located

approximately 7.0 miles southeast of the site (OG 2009a, p. 5.12-15). Funny Farm Airport is a private airport on 20-acres of land containing one runway (FAA 2010b). Funny Farm Airport handles approximately 50 aircraft per month (OG 2009a, p. 5.12-15). The nearest public airport to the OGS site is Rio Vista Municipal Airport, located approximately 11.5 miles northeast of the site (OG 2009a, p. 5.12-15). Rio Vista Municipal Airport contains two runways and a helipad serving general aviation activities (AirNav 2010a). For the one-year time frame ending November 5, 2008 (most recently published statistic), Rio Vista Municipal Airport handled an average of 96 aircraft per day, of which 50% was transient general aviation and 50% local general aviation (AirNav 2010a).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Significance criteria are based on the following:

1. California Environmental Quality Act (CEQA) Guidelines, including the CEQA Checklist found in Appendix G to the CEQA Guidelines, Section XVI. Transportation/Traffic.

2. Performance standards and thresholds established by state and local agencies

According to the Amendments of the CEQA Guidelines, effective March 18, 2010, a project may have a significant impact on the transportation system if it would:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersection);
- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes and transportation, including mass transit and nonmotorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths;
- Conflict with an applicable congestion management program, including, but not limited to, level of service standards (LOS) and travel demand measures or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels of a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). CEQA compliance to this guideline is determined by the extent, if any, that the project would substantially increase hazards due to a design feature;
- Result in inadequate emergency access;
- Result in inadequate parking capacity; or

- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

PERFORMANCE OF THE CIRCULATION SYSTEM

Levels of Service – Performance Standards

As stated in **Traffic and Transportation Table 1**, the city of Oakley uses LOS D as its threshold value to define maximum roadway segment capacity. Both SR 160 and SR 4/Main Street are designated as routes of regional significance in the Contra Costa County 2009 Countywide CTP. As shown in **Table 1** the LOS D threshold is used for a number of roadway types in the Countywide CTP and is therefore applied by staff to study area roadway segments designated as routes of regional significance.

Regarding intersection LOS performance standards, as stated in **Traffic and Transportation Table 1**, the city of Oakley considers LOS D as the limit of acceptable delay for intersections. Both SR 160 and SR 4/Main Street are designated as routes of regional significance in the city of Oakley General Plan. However, as shown in **Table 1,** the Contra Costa County 2009 Countywide CTP has no specific thresholds for intersection LOS. However, the city of Oakley Long Range Roadway plan establishes LOS D at signalized intersections and LOS E for any individual movement at unsignalized intersections for a route of regional significance (refer to **Table 1**). To analyze worst-case intersection impacts, the more stringent city of Oakley General Plan LOS D performance standard is utilized for all study area intersections analyzed.

Construction Impacts

Project construction is estimated to take 33 months to complete, with approximately 303 workers as the average construction workforce over this period (OG 2009a, p. 2-32). However, during months 10 through 30 of construction (the peak period), the maximum construction workforce may reach up to 729 workers (OG 2009a, p. 2-32). Therefore, estimated daily construction trips during the peak construction period were used to determine potential impacts, as this would represent the worst-case construction traffic scenario. Based on experience with similar projects, it is estimated that some of the workforce will carpool and the average vehicle occupancy will be 1.5 persons per vehicle (OG 2009a, p. 5.12-17).

In addition to the construction workforce trips, equipment deliveries and construction-related truck traffic will contribute additional trips during project construction. Truck and heavy equipment traffic were estimated using a passenger car equivalent (PCE) factor of 1.5 passenger cars per truck (OG 2009a, p. 5.12-17).

Traffic and Transportation Table 5 lists the estimate of total construction vehicle trip for the OGS, including identifying which of those would be generated during both the AM and PM peak hour periods.

Traffic and Transportation Table 5
Project Construction Trip Generation – Peak Construction Period

	Average Daily Trips[1]	AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
Construction Worker Vehicles	972	486	0	0	486
Delivery/Haul Trucks in PCE	120	8	8	8	8
Total Trips	*1,092*	*494*	*8*	*8*	*494*

Source: OG 2009a, p.5.12-17.
Notes: [1] Includes trips occurring outside the AM and PM peak periods.

Roadway Segment Levels of Service

Based on the construction vehicle trip calculations presented in **Traffic and Transportation Table 5**, an analysis was conducted in the AFC to determine the impacts of these construction vehicle trips on current LOS for project area roadway segments. **Traffic and Transportation Table 6** identifies the existing traffic volumes on each study area roadway segment and compares them with LOS anticipated when average peak-hour traffic generated during the construction period is added.

As shown in **Traffic and Transportation Table 6**, LOS of study area roadway segments will not be significantly impacted with the addition of the project peak construction traffic as compared to without project conditions. As shown, construction traffic associated with the project would not temporarily degrade any study area roadway segment to an unacceptable LOS performance standard. Therefore, no adverse impacts from construction traffic to roadway segment LOS would occur.

Intersection Levels of Service

Based on the construction vehicle trip calculations presented in **Traffic and Transportation Table 5**, an analysis was conducted in the AFC to determine the impacts of these construction vehicle trips on current LOS for project area intersections. **Traffic and Transportation Table 7** compares the existing intersection LOS to those anticipated with proposed project construction vehicle traffic added to study area intersections in the vicinity of the project.

As shown, construction traffic associated with the project would temporarily result in significant delays at both the intersections of Main Street/Bridgehead Road (PM peak hour) and Wilbur Avenue/Bridgehead Road (both AM and PM peak hours). LOS at these intersections during the peak hour indicated will degrade to an unacceptable LOS. It should be noted that under existing conditions, the intersection of Main Street/Bridgehead Road operates at an unacceptable LOS E during the PM peak hour.

Traffic and Transportation Table 6
With and Without Project Roadway Segments Levels of Service - Construction

Roadway	Segment	Existing ADT	Existing LOS	Added Vehicles	ADT With Project	LOS With Project	Threshold	*Exceed Threshold?*
Bridgehead Road	Between Shady Haven Trailer Park and Wilbur Ave.	9,500	D or Better	1,004	10,504	Better than LOS D	D	*NO*
Wilbur Avenue	Between SR 160 NB and SB ramps	10,600	D or Better	302	10,902	Better than LOS D	D	*NO*

		AM PEAK HOUR				PM PEAK HOUR					
Roadway	**Segment**	**Existing LOS**	**Added Vehicles**	**Peak Hour V/C With Project**	**Peak Hour LOS With Project**	**Existing LOS**	**Added Vehicles**	**Peak Hour V/C With Project**	**Peak Hour LOS With Project**	**AM and PM Peak Hour Threshold**	***Exceed Threshold?***
SR 4 EB	Between Hillcrest Ave. and SR 160 junction	C	173	0.62	C	C	3	0.63	C	D	*NO*
SR 4 WB	Between Hillcrest Ave. and SR 160 junction	B	3	0.53	B	B	173	0.53	B	D	*NO*
SR 160 NB	Between SR 4 East junction and Wilbur Ave.	A	173	0.13	A	A	3	0.19	A	D	*NO*
SR 160 SB	Between SR 4 East junction and Wilbur Ave.	A	3	0.17	A	A	173	0.18	A	D	*NO*
SR 160 NB	Between Wilbur Ave. and Antioch Bridge	A	2	0.10	A	A	124	0.25	A	D	*NO*
SR 160 SB	Between Wilbur Ave. and Antioch Bridge	A	124	0.22	A	A	2	0.16	A	D	*NO*
SR 160 NB	Between Antioch Bridge and SR 12 junction	B	2	N/A	B	C	124	N/A	C	D	*NO*
SR 160 SB	Between Antioch Bridge and SR 12 junction	C	124	N/A	C	B	2	N/A	B	D	*NO*

Source: OG 2009a, p. 5.12-18
Notes: N/A – data unavailable

Traffic and Transportation Table 7
With and Without Project Intersection Levels of Service - Construction

Intersection	Control	AM Peak Hour				PM Peak Hour				AM and PM Peak Hour Threshold	*Exceed Threshold?*
		Existing		With Project		Existing		With Project			
		Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS	Delay (Seconds)	LOS		
Main St. and SR 160 SB Ramps	Signalized	22	C	22	C	24	C	24	C	D	*NO*
Main St. and SR 160 NB Ramps	Signalized	16	B	16	B	32	C	33	C	D	*NO*
Main St. and Bridgehead Rd.	Signalized	27	C	27	C	65	**E**	88	**F**	D	***YES – PM Peak***
Wilbur Ave. and SR 160 SB ramps	Unsignalized	13	B	24 (SB approach)	C	13	B	26 (SB approach)	D	D	*NO*
Wilbur Ave. and SR 160 NB ramps	Unsignalized	15	B	12 (NB approach)	B	15	B	15 (NB approach)	C[1]	D	*NO*
Wilbur Ave. and Bridgehead Rd.	Unsignalized	30	D	64	**F**	20	C	62	**F**	D	***YES - AM and PM Peak***

Source: OG 2009a, p. 5.12-23
Notes: [1] The delay has been rounded up, which explains why for the same delay in seconds, the existing and with project PM Peak Hour LOS at the intersection are different.
Bold indicates unacceptable LOS.
NB – Northbound; SB – Southbound.

To reduce the significance of construction traffic to intersection LOS, staff is proposing Condition of Certification **TRANS-1,** which would require the applicant to prepare a Construction Traffic Control Plan prior to construction. The implementation of Condition of Certification **TRANS-1** would require the applicant to avoid construction related vehicle trips at both the Main Street/Bridgehead Road (PM peak hour) and Wilbur Avenue/Bridgehead Road (both AM and PM peak hours) intersections during peak construction periods to ensure no deterioration of the existing LOS performance standard at these intersections.

Linear Facilities

The OGS will be connected with the regional electrical grid by a 2.4-mile-long transmission line between the project site and the existing Contra Costa Substation (OG 2009a, p. 3-1). This transmission line will be placed within the existing 80-foot-wide Pacific Gas and Electric Company (PG&E) ROW that runs between the project site area and the substation (OG 2009a, p. 3-1). This transmission line will cross several local roadways and SR 160 (OG 2009a, Figure 3.2-1). This transmission line upgrade will upgrade an existing line with a new 230 kV line, crossing SR 160 overhead, and replacing existing steel lattice towers with new monopoles (CH2MHILL 2010v). PG&E has designated a pull-and-tensioning site in a vineyard just west of the highway crossing for transmission line stringing (CEC 2010a).

The new sanitary sewer will extend south along Bridgehead Road from a point adjacent to the project entrance road for 0.33 mile to Main Street (CH2MHILL 2010t). It will then turn eastward and run for 0.11 mile to the interconnection point with an existing Ironhouse Sanitary District (ISD) gravity main (CH2MHILL 2010t). This work will occur sometime during months 1 through 6 of the construction period, taking approximately one month to complete, and will involve a crew of 10 workers (CH2MHILL 2010t).

Construction of the sewer line will require lane closures on Bridgehead Road and Main Street (CH2MHILL 2010t). Furthermore, transmission line stringing activities have the potential to result in temporary lane and roadway closures, as well as potential disruptions to BNSF rail line operations. Traffic impacts from the construction of linear facilities would be short term in nature and are not expected to significantly impact traffic flow. Proposed Condition of Certification **TRANS-1** would ensure that the Construction Traffic Control Plan (prepared in conjunction with the city of Oakley and Caltrans) identify any temporary closure of vehicle travel lanes, disruptions to BNSF rail line use, and redirect traffic flow by cones and flagmen when necessary, as well as ensuring access to residential and/or commercial property.

Additionally, encroachment permits may be needed for roads within which new sewer line connections are constructed or are crossed by overhead transmission line stringing, as well as where transmission line construction activities would parallel existing roads and require the use of any public ROW (e.g., temporary lane closures). Condition of Certification **TRANS-4** requires that encroachment on public ROW during construction comply with Caltrans, Contra Costa County, city of Oakley, and other relevant jurisdictions limitations and requires all permits be obtained for such activities.

The implementation of Conditions of Certification **TRANS-1** and **TRANS-4** will mitigate any significant adverse temporary impact on traffic flows on the local roadway system, BNSF rail line use, and access during construction of the linear facilities to less than significant levels.

Operational Impacts

Once operational, the OGS would result in minimal vehicle trips to and from the site. A quantitative traffic analysis was not conducted in the AFC for the long-term operations phase because it would generate a low volume of trips that will not have a measurable impact on study area roadway segments and intersections (OG 2009a, p. 5.12-16). As shown in **Traffic and Transportation Table 3**, under existing conditions all study area roadway segments operate at LOS D or better. As shown in **Traffic and Transportation Table 4**, all study area intersections under existing conditions operate at LOS D or better, with the exception of the Main Street/Bridgehead Road intersection, which operates at an unacceptable LOS E during the afternoon peak hour. While this intersection currently operates at an unacceptable LOS, as project operations would result in minimal daily traffic on study area roadway segments and intersections, no degradation to existing LOS performance standards of street segment or intersections serving the project site will occur from project operations.

CONGESTION MANAGEMENT PROGRAM

California State Proposition 111, passed by voters in 1990, established a requirement that urbanized areas prepare and regularly update a Congestion Management Program (CMP). The purpose of the CMP is to monitor the performance of the countywide transportation system, develop programs to address near-term and long-term congestion, and better integrate transportation and land use planning. The Contra Costa County 2009 Countywide CTP fulfills this requirement and acts as the CMP for the project area.

As stated in **Traffic and Transportation Table 1**, the Contra Costa County 2009 Countywide CTP thresholds identify LOS D for both signalized suburban arterial routes and rural unsignalized roadways. No specific thresholds are identified in the Countywide CTP for intersection LOS in the East County planning area of the CTP. As shown in **Traffic and Transportation Table 6**, study area roadway segments will not exceed LOS D with the addition of the project peak construction traffic as compared to without project conditions. As discussed above, the OGS would result in minimal operational vehicle trips to and from the site. As project operations would result in minimal daily traffic on study area roadway segments and intersections, no degradation to existing LOS performance standards of street segment serving the project site will occur from project operations. Therefore, less than significant impacts to CMP performance standards for designated roadways would occur from construction or operational-related project traffic.

Airports

To be in compliance with 14 CFR part 77, FAA Form 7460 completion is required if the OGS would introduce (1) any construction or alteration of more than 200-feet in height above the ground level (AGL) at its site, or (2) any construction or alteration of greater

height than imaginary surface extending outward and upward at the following applicable slope (100 to 1 for horizontal distance of 20,000 feet from the nearest point of the nearest runway) (FAA 2010a).

Based on FAA 7460 requirement (1), the tallest permanent structure associated with the OGS would be the Heat Recovery Steam Generator (HRSG) stacks at 155-feet (OG 2009a, p. 5.13-29). Based on FAA 7460 requirement (2), as discussed earlier the nearest aviation facility is Funny Farm Airport located approximately 7.0 miles southeast of the site and not within the 20,000 feet threshold. Therefore, no impacts to aviation activities would occur from project permanent physical structures, and completion of FAA Form 7460 or an applicant secured FAA Determination of No Hazard to Navigable Airspace is not required.

Based on FAA Advisory Circular 70/7460-1K Obstruction Marking and Lighting, Chapter 2.0 - Part 20 (Structures to be Marked and Lighted) requirements, any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 200-feet AGL or exceeds any obstruction standard contained in 14 CFR part 77 should normally be marked and/or lighted (FAA 2010c). During construction, it is possible that cranes exceeding 200-feet in height could be utilized temporarily. In the event this occurs, staff is proposing Condition of Certification **TRANS-2**, which would require all construction equipment exceeding 200-feet in height adhere to FAA Advisory Circular 70/7460-1K Obstruction Marking and Lighting requirements. The inclusion of this condition ensures that during construction less than significant impacts to navigable airspace would occur. As discussed above, as all permanent project components are under 200-feet in height and do not exceed any obstruction standard of FAA Form 7460, no permanent project facilities are subject to FAA lighting or marking requirements.

Using the longitude and latitude of the HRSG stacks (tallest structure proposed), the OGS was run through the California Military Land Use Compatibility Analysis (CMLUCA) database to determine if the site is located within 1,000 feet of a military installation, is located within military based special use airspace, or is located beneath a military designated low-level flight path (CMLUCA 2010). Based on the CMLUCA report, the OGS does not intersect with any military bases, special use airspaces, or low level flight paths (CMLUCA 2010).

Project main gas turbine/HRSG operation and wet cooling tower exhaust would result in thermal air plumes during project operation. Thermal plumes are upward clear air exhaust and have the ability to impact low flying aircraft. Given the distance of the nearest airport facilities to the site, Funny Farm Airport (7.0 miles) and Rio Vista Municipal Airport (11.5 miles), no aircraft utilizing these airports are expected to have low flying direct overflight of the project site. Furthermore, as discussed in the **Visual Resources** section in this Preliminary Staff Assessment – Part A (PSA – Part A), Appendix VR-2 (Visible Plume Modeling Analysis), visible water vapor plumes from the proposed OGS project gas turbine/HRSG exhausts are predicted to occur less than 20% of seasonal daylight clear hours. Therefore, staff concludes that given the distance of the project from the nearest airports, both thermal and visible plumes associated with the OGS would pose no significant hazard to aircraft.

The nearest agricultural land use to the OGS would be vineyard use to the east and south of the site (OG 2009a p. 5.6-6). As low flying crop dusting aircraft are not typically associated with vineyard production, staff concludes the OGS would have no impact to low flying agricultural use aircraft. Furthermore, the proposed transmission line will be located within an existing utility easement and placed with the existing 69-kV transmission line on new monopole steel towers (OG 2009a p. 5.6-24). Monopole steel towers have a smaller footprint than the existing 69-kV lattice steel towers, thereby reducing the existing height of the transmission facilities (OG 2009a p. 5.6-24).

Hazards and Public Safety

Construction vehicle impacts to motorist and public safety would be minimized by proposed Condition of Certification **TRANS-1**. **TRANS-1** requires the preparation of a Construction Traffic Control Plan that includes the use of flagging and covering open trenches, minimizing hazards due to construction related vehicles entering and exiting the project site, and would divert construction-related traffic to the maximum extent feasible away from residential areas.

There is also a potential for unexpected damage to roads by vehicles and equipment within study area that could result in a roadway hazard to the public. Furthermore, the construction of the required sanitary sewer line will require subterranean construction within both Bridgehead Road and Main Street (CH2MHILL 2010t). Therefore, staff is proposing Condition of Certification **TRANS-3,** which would require that any road damaged by project construction be repaired to its original condition. This will ensure that any damage to local roadways will not be a safety hazard to motorists.

The use of oversize vehicles during construction can create a hazard to the public by limiting motorist views on roadways and by the obstruction of space. Enforcement is provided by state and local law enforcement and through ministerial state agency licensing and permitting and/or local agency permitting. As described above in **Traffic and Transportation Table 1**, CVC Sections 35550-35559 as well as both the Contra Costa County Oversize Vehicle Permit and city of Oakley Transportation Permit establish guidelines and require permits for oversize vehicle loads. To ensure consistency with these applicable ordinances, staff is proposing Condition of Certification **TRANS-4,** which would require that all oversize vehicles used on public roadways during construction comply with Caltrans, Contra Costa County, city of Oakley, and other relevant jurisdictions limitations on vehicle sizes and weights, as well as oversize vehicle routes and any other applicable limitations or other relevant jurisdictional policies.

At-grade railroad crossings can be another potential hazard to the public. As discussed earlier an active BNSF rail line is located approximately 750-feet south of the project site and crosses both Bridgehead Road and SR 160 (OG 2009a, Figure 5.12-2). However, this rail line contains a grade-separated crossing of Bridgehead Road. Therefore, construction- and operational-related vehicles accessing the project site from Bridgehead Road would have no impact to BNSF rail line operations. To ensure that rail safety is not jeopardized by transmission line stringing activities, Conditions of

Certification **TRANS-1** requires the Construction Traffic Control Plan to identify any temporary disruptions to BNSF rail line operations during transmission line stringing activities.

As discussed in the **Visual Resources** section in PSA – Part A, Appendix VR-2 (Visible Plume Modeling Analysis), Visible water vapor plumes from the proposed OGS Power Plant gas turbine/HRSG exhausts are predicted to occur less than 20% of seasonal daylight clear hours. No further visual impact analysis of the predicted gas turbine/HRSG exhaust plume dimensions was warranted. Based on these findings, no ground fogging plumes would occur with the OGS that could reach adjacent roadways. Therefore, the project would have no impact on ground traffic safety with regards to visible plumes.

The implementation of Conditions of Certification **TRANS-1**, **TRANS-3**, and **TRANS-4** would ensure that the OGS results in less than significant traffic- and transportation-related hazard and safety impacts and ensure project compliance to LORS pertaining to such.

Another anticipated increase in traffic during project construction and operation would be truck trips, including delivery of hazardous materials and removal of wastes. For a discussion of the potential impacts related to the transport of hazardous materials please see the **Hazardous Materials Management** section in PSA – Part A.

Emergency Access

In the event of an emergency at the project site during construction, emergency vehicles would use the proposed driveway on Bridgehead Road to access the project site (OG 2009a, p. 5.12-25). To maintain access for emergency vehicles and allow for adequate access into and surrounding the facility during project construction, proposed Condition of Certification **TRANS-1** requires the preparation of a Construction Traffic Control Plan which includes the assurance of access and movement of emergency vehicles in and around the project site. This condition would result in less than significant impacts to emergency vehicle access during construction. For a discussion of emergency services access within the proposed facility during operation, refer to the **Worker Safety and Fire Protection** section in PSA – Part A.

Parking

During construction, workers and construction vehicles will park at the project laydown area within the project site boundaries (OG 2009a, p. 5.12-25). Based on this, no on-street parking is anticipated or required during construction (OG 2009a, p. 5.12-25). Once operational, on-site parking will be provided for all employee and maintenance vehicles (OG 2009a, p. 5.12-25). Therefore, both construction and operation of the OGS will have no impact on public parking resources serving the area.

Alternative Transportation

As discussed above, no local bus stops, pedestrian facilities, or bicycle routes are within the project site footprint. To ensure pedestrian and bicycle safety along local roadways utilized during project construction, proposed Condition of Certification **TRANS-1** requires the preparation of a Construction Traffic Control Plan which includes the

ensurance of pedestrian and bicycle safety along construction vehicle travel routes and identification of safety procedures for exiting and entering the site access gate.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. *Cumulatively considerable* means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Title 14, California Code Regulation, section 15130).

Continued development of the city of Oakley has contributed to congestion on study area roadways that would be used by project related traffic. One project identified that could impact traffic conditions from a cumulative perspective in the vicinity of the OGS site is the River Oaks Crossing, which is proposed on property south of the project site and BNSF railroad tracks (OG 2009a, p. 5.12-25). However, at the time of preparation of this Preliminary Staff Assessment, coordination with the City of Oakley has indicated that no construction date has been set for this project so the potential for overlapping construction schedules is unknown (CEC 2011a). Based on this, consideration of cumulative impacts of this project with the proposed OGS is not provided.

Additionally, the Marsh Landing Generating Station (MLGS) was approved by the Energy Commission on August 25, 2010 (California Energy Commission a). The MLGS will construct a new power plant in Antioch, northwest of the OGS project site, with construction starting sometime in the first quarter of 2011. Based on this start date and estimated construction duration of 27 months, it is likely that construction traffic of this project will combine with OGS related construction traffic. A review of the MLGS Final Staff Assessment (California Energy Commission b) and Presiding Member's Proposed Decision (California Energy Commission c) indicates that construction and operational traffic associated with the project was analyzed and anticipated to be concentrated along the roadway segments of SR 4 at Willow Pass Road intersection, SR 160 at Wilbur Avenue, Wilbur Avenue between Vera Avenue and Fleming Avenue, and Wilbur Avenue between Fleming Avenue and SR-160 Southbound ramp. As such, traffic associated with this project would be concentrated west of SR 160 and is not expected to add cumulatively to OGS related traffic volumes on Main Street and Bridgehead Road (as presented in **Traffic and Transportation Tables 6** and **7**), which would occur east of SR 160. Intersections of concern would be cumulative use of SR 160 northbound and southbound on/off ramps at Wilbur Avenue by both projects during construction. Peak construction traffic associated with the MLGS would generate 457 daily trips with primary access to the site being the SR 160/Wilbur Avenue ramps.

However, as approved, the MLGS requires all construction workers to arrive during off-peak traffic periods; before 7 AM and after 9 AM. By doing so, workers would then correspondingly leave the site at the end of their shifts before or after the PM peak period. The incorporation of this condition as part of the approved MLGS ensures that minimal daily construction related traffic would combine with OGS construction traffic at SR 160 northbound and southbound on/off ramps during the AM and PM peak periods.

Therefore, cumulative impacts would not occur and no change to SR 160 northbound and southbound on/off ramps LOS (as presented in **Traffic and Transportation Table 7**) would occur.

Cumulative impacts resulting from operational traffic would be unlikely, due to the relatively low numbers of vehicle trips that the CCGS would generate (OG 2009a, p. 5.12-26). Therefore, the proposed project's cumulative contribution to operational traffic impacts is considered less than significant. Furthermore, part of the Traffic Impact Fee Program (**refer to Traffic and Transportation Table 9**) is the Regional Transportation Development Impact Mitigation Fee (adopted by Resolution No. 73-05, or any future alternative regional fee adopted by the city) to finance roadway improvements to reduce the impacts cause by future development in the City. In an April 7, 2010 Cooperation and Community Benefits Agreement between the applicant and the city of Oakley, the project applicant has agreed to contribute to the City over $3 million for improvement projects (COO 2010c). These projects include a number of citywide roadway improvements.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Traffic and Transportation Table 8 provides a general description of applicable statutes, regulations, and standards adopted by the federal government, the State of California, and local agencies pertaining to traffic and transportation with which the project is required to comply. Conditions of certification have been proposed to ensure project consistency with a law, ordinance, regulation, or standard where it was not already mandated by federal or state regulations.

Traffic and Transportation Table 8
Project Compliance with Adopted Traffic and Transportation Laws, Ordinances Regulations, and Standards

Applicable Law	LORS Description and Project Compliance Assessment
Federal	
Title 14, CFR, section 77 (14 CFR 77)	Includes standards for determining physical obstructions to navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alterations. Also provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace (including temporary flight restrictions).
	The proposed project would not include any permanent structures taller than 200 feet and would not be within 20,000 feet of any airport. Therefore, no impacts to aviation activities would occur from project physical structures, and completion of FAA Form 7460 or an applicant secured FAA Determination of No Hazard to Navigable Airspace is not required. In the event any construction equipment would exceed 200-feet in height, Condition of Certification **TRANS-2** would ensure that FAA Advisory Circular 70/7460-1K Obstruction Marking and Lighting requirements pertaining to such are adhered to.
State	
California Vehicle Code, division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
	Staff is proposing Condition of Certification **TRANS-4,** which would require that all oversize vehicles used on public roadways during construction comply with Caltrans limitations on vehicle sizes and weights.
California Streets and Highway Code, division 1 & 2, chapter 3 & chapter 5.5	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits.
	Staff is proposing Condition of Certification **TRANS-3,** which would require that any road damaged by project construction be repaired to its original condition.
California Street and Highway Code §§117, 660-711	Requires permits from California Department of Transportation (Caltrans) for any roadway encroachment during oversize truck transportation and delivery. Such encroachment permits are also needed for roads that would include construction from new sewer line connections or be crossed by overhead transmission line stringing, as well as for parallel roads where transmission line construction activities would require the use of any public right-of-way (e.g., temporary lane closures).
	Staff is proposing Condition of Certification **TRANS-4,** which would require that any encroachment on public right of way during construction obtain all necessary Caltrans permits required for these actions.
California Street and Highway Code §§660-711	Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.
	Staff is proposing Condition of Certification **TRANS-4,** which would require that all oversize vehicles used on public roadways during construction comply with Caltrans limitations on vehicle sizes and weights.
Local	
Contra Costa County 2009 Countywide Comprehensive Transportation Plan	The Contra Costa County 2009 Countywide CTP, multimodal transportation service objectives indicate the following performance standards: • SR 4 and the SR 4 Bypass: Delay Index should not exceed 2.5 during the AM or PM Peak Period for these facilities; HOV lane utilization should exceed 600 vehicles per lane in the peak direction at peak hour. • Signalized Suburban Arterial Routes: LOS D (by Contra Costa County Transportation Authority LOS methodology). • All other Signalized Suburban Arterials: Peak hour volume to capacity ratio

	no worse than 0.85. • Rural Unsignalized Roadways: LOS D (by roadway segment). • Traffic Management Plan (TMP) Sites: Roadway segments subject to a TMP may be analyzed using a measure other than LOS or V/C during TMP operations.
	As shown in **Traffic and Transportation Table 6**, all study area roadway segments would operate at LOS D or greater during construction. Project operations would have no impacts to exiting LOS performance standards of study area roadway segments and intersections. Therefore, the proposed project would be consistent with this Plan.
Contra Costa County Oversize Vehicle Permit	Contra Costa County requires a permit before operating any extra-legal loaded vehicles within the County.
	Staff is proposing Condition of Certification **TRANS-4,** which would require that all oversize vehicles used on public roadways during construction comply with Contra Costa County limitations on vehicle sizes and weights.
City of Oakley General Plan Circulation Element	• Policy 3.1.1: Strive to maintain Level of Service D as the minimum acceptable service standard for intersections during peak periods (except those facilities identified as Routes of Regional Significance). • Policy 3.1.2: For those facilities identified as Routes of Regional Significance, maintain the minimum acceptable service standards specified in the East County Action Plan Final 2000 Update, or future Action Plan updates as adopted.
	As shown in **Traffic and Transportation Table 6**, all study area roadway segments identified as Routes of Regional Significance would operate at LOS D or greater during construction. However, as shown in **Traffic and Transportation Table 7**, construction traffic associated with the project would temporarily result in significant delays at both the intersections of Main Street/Bridgehead Road (PM peak hour) and Wilbur Avenue/Bridgehead Road (both AM and PM peak hours). LOS at these intersections during the peak hour indicated will degrade to an unacceptable LOS. Condition of Certification **TRANS-1** would reduce temporary construction traffic impacts to these intersections. However, during construction the proposed project would be temporarily inconsistent with city of Oakley General Plan policy 3.1.1. Project operations would have no impacts to existing LOS performance standards of study area roadway segments and intersections. It should be noted that under existing conditions, the intersection of Main Street/Bridgehead Road operates at an unacceptable LOS E during the PM peak hour.
City of Oakley Long Range Roadway Plan	The Long Range Roadway Plan has adopted LOS D, or a volume-to-capacity (V/C) ratio of 0.90, as the threshold of acceptability for signalized intersections. Routes of Regional Significance are subject to special performance standards. The level of service established for a route of regional significance in Oakley is a peak hour LOS D at signalized intersections, and a peak hour LOS E for any individual movement at unsignalized intersections.
	As shown in **Traffic and Transportation Table 7**, construction traffic associated with the project would temporarily result in significant delays at both the intersections of Main Street/Bridgehead Road (PM peak hour) and Wilbur Avenue/Bridgehead Road (both AM and PM peak hours). LOS at these intersections during the peak hour indicated will degrade to an unacceptable LOS. Condition of Certification **TRANS-1** would reduce temporary construction traffic impacts to these intersections. However, during construction the proposed project would be temporarily inconsistent with the city of Oakley Long Range Roadway Plan performance standards. Project operations would have no impacts to exiting LOS performance standards of study area roadway segments and intersections. It should be noted that under existing conditions, the intersection of Main Street/Bridgehead Road operates at

	an unacceptable LOS E during the PM peak hour.
City of Oakley Transportation Permit	The city of Oakley's transportation permit requires approval from the Public Works Department before operating any oversized loads on city roads.
	Staff is proposing Condition of Certification **TRANS-4,** which would require that all oversize vehicles used on public roadways during construction comply with City of Oakley limitations on vehicle sizes and weights.

In a letter dated April 5, 2010, the city of Oakley provided staff with comments on the proposed project and submitted a number of city recommended conditions of approval (COO 2010a). While these **Traffic and Transportation Table 9** summarizes traffic and transportation related city recommended conditions of approval and provides a project compliance assessment.

Traffic and Transportation Table 9
Project Compliance with City of Oakley Recommended Conditions of Approval

Recommended Condition of Approval	Project Compliance Assessment
22. Repair all roadways affected by installation of underground linear facilities to at least their preconstruction condition and coordinate these efforts with city of Oakley, Contra Costa County, and Caltrans.	Condition of Certification **TRANS-3** requires that any road damaged by project construction be repaired to its original condition and coordinated with the appropriate jurisdiction.
23. Schedule all actions and necessary to complete roadway repairs with city of Oakley.	Condition of Certification **TRANS-3** requires that any road damaged by project construction be repaired to its original condition and coordinated with the appropriate jurisdiction.
24. The project owner shall provide appropriate evidence of compliance with Federal Aviation Administration (FAA) regulations to the Oakley Community Development Department regarding the marking and/or lighting of the project's exhaust stacks.	As all permanent project components are under 200-feet in height and do not exceed any obstruction standard of FAA Form 7460, no proposed project components are subject to FAA lighting or marking requirements. During construction, it is possible that cranes exceeding 200-feet in height could be utilized. In the event this occurs, staff is proposing Condition of Certification **TRANS-2**, which would require all construction equipment exceeding 200-feet in height adhere to FAA Advisory Circular 70/7460-1K Obstruction Marking and Lighting requirements.
39. Construct the frontage of Bridgehead Road to City public road standards for a four lane divided arterial, including curb, sidewalk, right of way landscaping, a sixteen foot wide landscaped median, necessary longitudinal and transverse drainage, pavement widening, and conformance to existing improvements.	Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's CUP requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
40. Design all public pedestrian facilities in accordance with Title 24 (Handicap Access) and the Americans with Disabilities Act.	Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's CUP requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
41. Submit a preliminary plan and profile to the City Engineer for review and approval showing all required improvements to Bridgehead Road, and pay appropriate review and processing costs.	Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's CUP requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
42. Locate any project signs so as to not obstruct sight distance at the intersection of Bridgehead Road and the project driveways. The design speed for Bridgehead Road shall be 55 mph.	Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's CUP requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
43. Convey to the City, by offer of dedication, the right of way for Bridgehead Road along the project frontage.	Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's CUP requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.

44. Relinquish abutter's rights of access along Bridgehead Road except for the one approved driveway location.	Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's CUP requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
45. Furnish necessary rights of way, rights of entry, permits and/or easements for the construction of off-site, temporary or permanent, public and private road and drainage improvements.	Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's CUP requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
46. Obtain an encroachment permit from Caltrans for construction of any improvements within the State right of way.	Condition of Certification **TRANS-4** requires that encroachment on public ROW during construction comply with Caltrans, Contra Costa County, city of Oakley, and other relevant jurisdictions limitations and requires all permits be obtained for such activities.
47. Applicant shall only be allowed access to the project site at the one location shown on the approved site plan.	Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's CUP requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
55. Submit a haul route plan to the City Engineer for review and approval prior to importing or exporting any material from the site, and pay all appropriate review and processing costs. The plan shall include the location of the borrow or fill area, the proposed haul routes, the estimated number and frequency of trips, and the proposed schedule of hauling. Based on this plan the City Engineer shall determine whether pavement condition surveys must be conducted along the proposed haul routes to determine what impacts the trucking activities may have. The project proponents shall be responsible to repair to their pre-construction condition any roads along the utilized routes.	Condition of Certification **TRANS-1** requires that a Construction Traffic Control Plan be prepared in coordination with city of Oakley and include construction vehicle haul routes, location of the borrow/fill area, estimated number and frequency of construction vehicle trips, and proposed schedule of hauling. Furthermore, Condition of Certification **TRANS-3** requires that any road damaged by project construction be repaired to its original condition and coordinated with the appropriate jurisdiction.
69a. Comply with the requirements of the Traffic Impact Fee (authorized by Ordinance No. 14-00, adopted by Resolution 49-03).	Condition of Certification **TRANS-5** requires that the project owner pay the Traffic Impact Fee in coordination with city of Oakley.
69b. Comply with the requirements of the Regional Transportation Development Impact Mitigation Fee or any future alternative regional fee adopted by the City (authorized by Ordinance No. 14-00, adopted by Resolution No. 73-05).	Condition of Certification **TRANS-5** requires that the project owner pay the Regional Transportation Development Impact Mitigation Fee or any future alternative regional fee in coordination with city of Oakley.

NOTEWORTHY PUBLIC BENEFITS

Neither the applicant nor staff has identified any traffic-related benefits associated with the OGS.

CONCLUSIONS

Based on the list of significance thresholds identified above, staff has analyzed potential

construction and operational impacts by the OGS related to the regional and local traffic and transportation system and conclude the following:

- Condition of Certification **TRANS-1** should be implemented to ensure that all construction-related traffic and construction-related activities would result in less than significant adverse impact along the routes or roadway intersections that would be used to access the OGS site regarding a substantial increase in congestion, deterioration of the existing LOS performance standard, or creation of a traffic hazard during any time in the daily traffic cycle.
- The OGS would not include any permanent structures taller than 200-feet. Therefore, no impacts to aviation activities would occur from project physical structures and no FAA required lighting is required, and completion of FAA Form 7460 or an applicant secured FAA Determination of No Hazard to Navigable Airspace is not required. Condition of Certification **TRANS-2** should be implemented to ensure that any temporary construction equipment over 200-feet in height have all lighting and marking required by the FAA to not create a hazard to air navigation.
- Condition of Certification **TRANS-3** should be implemented to ensure that any road damaged by project construction be repaired to its original condition.
- Condition of Certification **TRANS-4** should be implemented to ensure that all oversize vehicles used on public roadways and roadway encroachment during construction comply with Caltrans, Contra Costa County, city of Oakley, and other relevant jurisdictions limitations on vehicle sizes, weights, encroachment, and travel routes and obtain any permits required for these actions.
- No construction worker or vehicle parking will occur in or on public parking resources during construction of the OGS. Once operational, no offsite operational-related parking would occur and public parking areas would not be affected.
- Condition of Certification **TRANS-1** should be implemented to ensure pedestrian and bicycle safety along travel routes of construction vehicles to the project site, identification of safety procedures for exiting and entering the site access gate, and identifying any disruptions to street segments, intersections, or BNSF rail line operations during transmission line stringing activities or any other utility tie ins.
- Condition of Certification **TRANS-5** should be implemented to ensure that the project owner complies with the requirements of the city of Oakley Traffic Impact Fee (authorized by Ordinance No. 14-00, adopted by Resolution 49-03) and the Regional Transportation Development Impact Mitigation Fee or any future alternative regional fee adopted by the City (authorized by Ordinance No. 14-00, adopted by Resolution No. 73-05).

Should the Energy Commission certify the project, staff recommends that the Energy Commission adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall consult with the city of Oakley and prepare and submit to the Compliance Project Manager (CPM) for approval a Construction Traffic Control Plan and implementation program. The Construction Traffic Control Plan must

be prepared in accordance with Caltrans Manual on Uniform Traffic Control Devices and the WATCH Manual and must include but not be limited to the following issues:

- Construction-related vehicles shall avoid the intersections of Main Street/Bridgehead Road (4:00 PM – 6:00 PM) and Wilbur Avenue/Bridgehead Road (7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM) during peak periods of construction ensuring no deterioration of the existing LOS performance standard at these intersections through provisions for monitoring intersection operations
- Temporary closure of travel lanes or disruptions to street segments, intersections, or BNSF rail line operations during transmission line stringing activities or any other utility tie ins
- Timing of heavy equipment and building materials deliveries
- Specification of construction-related haul routes, avoiding residential neighborhoods to the maximum extent feasible, and including the location of borrow or fill areas, the estimated number and frequency of trips, and the proposed schedule of hauling
- Redirecting construction traffic with a flag person or temporary restriping if required
- Signing, lighting, and traffic control device placement if required
- Ensurance of access for emergency vehicles into the project site and through any construction-related temporary travel lane closures or disruptions
- Ensurance of pedestrian and bicycle safety from construction vehicle travel routes and any construction-related temporary travel lane closures or disruptions
- Procedures for exiting and entering the site
- Access to residential and/or commercial property located near transmission line routes or any other utility tie-ins and any construction-related temporary travel lane closures or disruptions

Verification: At least 30 days prior to site mobilization, the project owner or contractor shall provide the Construction Traffic Control Plan to the CPM for review and approval.

TRANS-2 The project owner shall ensure that all temporary construction equipment over 200-feet in height shall have lighting and marking consistent with FAA Advisory circular 70/7460-1 K, Obstruction Marking and Lighting, 34 (Markers) for temporary construction equipment so not to create a hazard to air navigation

Verification: In the event construction equipment over 200-feet in height is to be utilized, the project owner shall submit FAA Form 7460-2, Notice of Actual Construction or Alteration, to the FAA at least 10 days prior to start of construction (7460-2, Part I) and within 5 days after the construction reaches its greatest height (7460-2, Part II), showing consistency with FAA Advisory Circular 70/7460-1K Obstruction Marking and Lighting requirements for temporary construction equipment. A copy of these forms shall be provided to the CPM.

TRANS-3 Following completion of project construction, the project owner shall repair any damage to roadways affected by construction activity along with the

primary roadways identified in the traffic control plan for construction traffic to the road's pre-project construction condition. Prior to the start of construction, the project owner shall photograph, videotape, or digitally record images of the roadways that will be affected by all utility line construction and heavy construction traffic. The project owner shall provide the CPM, city of Oakley, Contra Costa County, and/or Caltrans with a copy of the images for the roadway segments under its jurisdiction. Also prior to start of construction, the project owner shall notify the city, Contra Costa County, and/or Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction-related activities associated with other projects.

Verification: Within 30 days after completion of the project, the project owner shall meet with the CPM and city of Oakley to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near-original condition as possible. Following completion of any regional road improvements, the project owner shall provide to the CPM a letter from Contra Costa County, Caltrans, or other relevant jurisdiction if work occurred within its jurisdictional public ROW stating its satisfaction with the road improvements.

TRANS-4 The project owner shall comply with Caltrans, Contra Costa County, city of Oakley, and other relevant jurisdictions limitations on vehicle sizes, weights, roadway encroachment, and travel routes and obtain any permits required for these actions.

Verification: In the Monthly Compliance Reports, the project owner shall indicate that all required permits were obtained and list the jurisdictions they were acquired from, or indicate if no permits were necessary, during that reporting period. In addition, the project owner shall retain copies of all acquired permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-5 The project owner shall coordinate with the city of Oakley and pay the applicable Traffic Impact Fee (authorized by Ordinance No. 14-00, adopted by Resolution 49-03) and the Regional Transportation Development Impact Mitigation Fee or any future alternative regional fee adopted by the City (authorized by Ordinance No. 14-00, adopted by Resolution No. 73-05).

Verification: At least 30 days prior to the start of project construction, the project owner shall provide to the Compliance Project Manager (CPM) proof of payment of the Traffic Impact Fee (authorized by Ordinance No. 14-00, adopted by Resolution 49-03) and the Regional Transportation Development Impact Mitigation Fee or any future alternative regional fee adopted by the City (authorized by Ordinance No. 14-00, adopted by Resolution No. 73-05).

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ENGINEERING ASSESSMENT

TRANSMISSION SYSTEM ENGINEERING

Laiping Ng and Mark Hesters

SUMMARY OF CONCLUSIONS

The proposed interconnection facilities including the Oakley Generating Station (OGS) 230 kV switchyard, single 230 kV overhead generator tie-line, and termination to the proposed Pacific Gas and Electric Company (PG&E) Contra Costa Substation are adequate and in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering Laws, Ordinances, Regulations and Standards (LORS).

- The interconnection of the OGS will cause new transmission line overloads under normal and contingency conditions. Mitigation includes installation of Special Protection System (SPS), rerate transmission line, and reconductoring the overloaded transmission lines. The applicant is partially responsible for the transmission system upgrades.
    - The reconductoring of the following lines should be considered a reasonably foreseeable consequence of the interconnection of the OGS and a general environmental analysis should be included in Staff's final assessment:
        - 18. 3 mile-long Contra Costa PP – Delta Pumps 230 kV transmission line reconductoring
        - 8 mile-long Kelso – Tesla 230 kV line transmission line reconductoring
        - 21 mile-long Las Positas - Newark 230 kV transmission line reconductoring.
- The interconnection of the OGS will require replacement of the circuit breaker at Pittsburg PP Switching Station. Other existing breakers are adequate to withstand the post project incremental fault currents described in the Short Circuit Study.

INTRODUCTION

STAFF ANALYSIS

This Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conform to all applicable LORS required for safe and reliable electric power transmission. Additionally, under the CEQA, the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (Cal Code Regs, tit 14, §15378). Therefore, the Energy Commission must identify the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are required for interconnection and that represent the "whole of the action."

Energy Commission staff relies on the interconnecting authority, in this case the California Independent System Operator (California ISO), for the analysis of impacts on the transmission grid from the proposed interconnection as well as the identification and approval of new or modified facilities downstream that may be required as mitigation

measures. The proposed project would connect to the PG&E transmission network and requires analysis by PG&E and approval of the California ISO.

ROLE OF PACIFIC GAS AND ELECTRIC

PG&E is responsible for ensuring electric system reliability on its transmission system with the addition of the proposed transmission modifications, and determines both the standards necessary to ensure reliability and whether the proposed transmission modifications conform to existing standards. The California ISO will provide analysis in its Phase I and Phase II Interconnection Studies, and its approval for the facilities and changes required in its system for addition of the proposed transmission modifications.

ROLE OF CALIFORNIA INDEPENDENT SYSTEM OPERATOR

The California ISO is responsible for dispatching generating units in California, ensuring electric system reliability for all participating transmission owners and for developing the standards and procedures necessary to maintain system reliability. The California ISO will review PG&E's studies to ensure the adequacy of the proposed OGS transmission interconnection. The California ISO will also determine the reliability impacts of the proposed transmission modifications on the PG&E transmission system in accordance with all applicable reliability criteria. According to the California ISO Tariff, it will determine the need for transmission additions or upgrades downstream from the interconnection point to ensure reliability of the transmission grid. The California ISO will, therefore, perform the Phase I Interconnection Study and provide its analysis, conclusions, and recommendations. On completion of the Phase II Interconnection Study, the California ISO will provide its conclusions and recommendations, and issue a final approval/disapproval for the interconnection of the proposed generation project. If necessary, the California ISO will provide written and verbal testimony on its findings at the Energy Commission hearings.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

- California Public Utilities Commission General Order 95, *Rules for Overhead Electric Line Construction*, formulates uniform requirements for construction of overhead transmission lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, and operation or use of overhead electric lines and to the public in general.
- California Public Utilities Commission General Order 128, *Rules for Construction of Underground Electric Supply and Communications Systems*, formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance, and operation or use of underground electric lines and to the public in general.
- The National Electric Safety Code, 1999, provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.
- The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Corporation (NERC) Planning Standards and provide the system performance standards used in assessing the

reliability of the interconnected system. These standards require the continuity of service to loads as the first priority, and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage, and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on section I. A. of the standards, entitled *NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table,* and on section I. D., entitled *NERC and WECC Standards for Voltage Support and Reactive Power*. These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage, and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, its uncontrolled loss is not permitted (WECC 2002).

- NERC Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles, and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. While these reliability standards are similar to NERC/WECC standards, certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards with regard to power flow and stability simulations for transmission system contingency performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).
- California ISO Planning Standards also provide standards and guidelines to assure adequacy, security, and reliability in the planning of the California ISO transmission grid facilities. The California ISO Standards incorporate the NERC/WECC and NERC standards. With regard to power flow and stability simulations, these standards are similar to the NERC/WECC or NERC standards for transmission system contingency performance. However, the California ISO standards also provide some additional requirements that are not found in the NERC/WECC or NERC standards. The California ISO standards apply to all participating transmission owners interconnecting to the grid controlled by California ISO. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent grids not operated by California ISO (California ISO 2002a).

- The California ISO/FERC (Federal Energy Regulatory Commission) Electric Tariff provides guidelines for construction of all transmission additions/upgrades within the grid controlled by California ISO. The California ISO determines the need for the proposed project where it will promote economic efficiency or maintain system reliability. The California ISO also determines the cost responsibility of the proposed project and provides an operational review of all facilities that are to be connected to the California ISO grid (California ISO 2003a).

PROJECT DESCRIPTION AND INTERCONNECTION FACILITIES

The OGS is a natural gas-fired combined-cycle power generating facility that would be located in Oakley, Contra Costa County, California. The OGS would consist of two combustion turbine-generators (CTG) and a steam turbine generator (STG). The maximum output of the OGS would be 672 megawatts (MW). With the generator auxiliary load of 21 MW, net output of the OGS would be 651 MW. The OGS would be interconnected to the PG&E Contra Costa Substation. The proposed commercial operation date of the OGS is late 2013.

The combustion turbine generator is rated at 247 MVA with a power factor of 0.90. The STG is rated at 253 MVA with a power factor of 0.90. Each CTG would be connected through a 9,000-ampere generator circuit breaker and a 9,000-ampere disconnect switch, through a short 9,000-ampere isolated phase bus duct to the low sides of its dedicated 159/212/265 MVA generator step-up (18/230 kV) transformer. The STG would be connected through a short 9,000-ampere isolated phase bus duct to the low side of its dedicated 159/212/265 MVA generator step-up (18/230 kV) transformer. The auxiliary power would be provided by the CTG units through their dedicated 1,200-ampere isolated phase bus ducts and their dedicated back-fed step-down (18/4.16 kV) transformers. The high sides of the CTG transformers and the high side of the STG transformer would each be connected through their dedicated 1,200-ampere SF6 breakers and 1,200-ampere disconnect switches to the common generator tie bus. A single 230 kV overhead generator tie-line would connect the OGS through a 2,000-ampere disconnect switch to the PG&E Contra Costa Substation.

The 2.4-mile long single circuit generation tie-line would be built with 1272 kcmil ACSR bundled conductors and would be supported by both single-circuit steel pole structures and double-circuit steel pole structures. The generator tie-line would be built using the existing Contra Costa – DuPont 60 kV line right-of-way. The existing Contra Costa – DuPont 60 kV line will be removed and demolished. South of Main Street of the OGS generator tie-line would be supported by single-circuit steel poles. Generator tie-lines on North of Main Street would be supported by double-circuit steel poles. The double-circuit steel poles would support the OGS generator tie-line and the existing 60 kV line which taps the Contra Costa – Balfour 60 kV line at the intersection of Bridgehead Road and Main Street. The existing Contra Costa Substation would need to be extended in order to accommodate the OGS. Power would be distributed to the grid via existing transmission lines from the Contra Costa Substation (OG 2009a Section3.2, Figure 2.1-5, CH2MHILL 2010m, CH2MHILL 2010ad Figures 2-1).

These proposed facilities are acceptable to staff and Conditions of Certification **TSE-1** through **7** ensure these facilities comply with LORS.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility (PG&E in this case) and the control area operator (California ISO) are responsible for ensuring grid reliability. These entities determine the transmission system impacts of the proposed project, and any mitigation measures needed to ensure system conformance with performance levels required by utility reliability criteria, NERC planning standards, WECC reliability criteria, and California ISO reliability criteria. The Phase I and Phase II Interconnection Studies are used to determine the impacts of the proposed project on the transmission grid. Staff relies on these studies and any review conducted by the California ISO to determine the project's effect on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards.

The Phase I and Phase II Interconnection Studies analyze the grid with and without the proposed project under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds through which grid reliability is determined. The studies must analyze the impact of the project for the first year of operation and thus are based on a forecast of loads, generation, and transmission. Load forecasts are developed by the interconnecting utility and the California ISO. Generation and transmission forecasts are established by an interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads, or cascading outages), and short circuit duties.

If the Phase I and Phase II Interconnection Studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards, then the studies will identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. When a project connects to the grid controlled by California ISO, both the studies and mitigation alternatives must be reviewed and approved by the California ISO. If the mitigation identified by California ISO or interconnecting utility includes transmission modifications or additions that require CEQA review as part of the "whole of the action," the Energy Commission must analyze the environmental impacts of these modifications or additions.

CALIFORNIA INDEPENDENT SYSTEM OPERATOR STUDY

The California ISO completed both of the Transition Cluster Group 1 Phase I Interconnection Study and the Phase II Interconnection Study. The interconnection of the OGS will be based on the Phase II Interconnection Study.

SCOPE OF TRANSITION CLUSTER PHASE I AND PHASE II INTERCONNECTION STUDIES

The July 28, 2009, Transition Cluster Group 1 Phase I Interconnection Study was prepared by the California ISO in coordination with PG&E. There were 12 projects, 4,707 MW in the Group 1 (Greater Bay Area) cluster including the proposed OGS project. The California ISO used a net output of 4,707 MW in its Phase I Interconnection Study. As of December 2009 only six projects (1,159 MW) of the original twelve projects in the Group 1 cluster remain in the interconnection queue.

Generally staff relies on the California ISO Phase I/SIS to determine whether or not the proposed generation project will likely comply with reliability and to identify the transmission facilities required for reliable interconnection. For the Transition Cluster projects, the Phase I Study did not provide an accurate forecast of impacts on the transmission grid. Therefore, staff has relied on the Phase II Interconnection Study Report that was completed and received on November 5, 2010 and the revision 2.0 of the Appendix A, Phase II Interconnection Study Report received on December 17, 2010, to determine the impact on grid reliability and identify transmission upgrades for reliable interconnection.

The Phase II Group Study modeled the OGS project with a net output of 651 MW. The base case was developed from PG&E's 2009 base case series. It has a 1-in-10 year adverse weather load level for the Greater Bay Area. The 2013 summer peak load and 2013 summer off-peak load base cases included all pre-Transition Cluster generation projects and the associated Network Upgrades and Special Protection System, as well as the planned California ISO approved transmission upgrade projects that are scheduled to be in service by 2013. The power flow studies were conducted with and without the proposed Greater Bay Area Transition Cluster Group Phase II projects connected to the PG&E grid at each project's proposed interconnection point. The detailed study assumptions were described in the study. The Power Flow study assessed the Greater Bay Area Transition Cluster Group Phase II projects' impact on thermal loading of the transmission lines and equipment. Short circuit studies were conducted to determine if the Greater Bay Area Transition Cluster Group Phase II projects would overstress existing substation facilities. Transient Stability Evaluation studies were conducted using the 2013 summer peak load full loop base case to determine whether the Greater Bay Area Transition Cluster Group Phase II projects would create instability in the system following certain selected outages (CH2MHILL 2010b Section 3, CH2MHILL 2010y, CH2MHILL 2010ad).

PHASE II STUDY RESULTS FOR TRANSITION CLUSTER PROJECTS

Power Flow Study Results and Mitigation Measures

The Phase II Group Study identified pre-project overload criteria violations under 2013 Summer Peak and Off-Peak study conditions. Pre-project overloads are caused by either existing system conditions or by projects with higher positions in the PG&E's generator interconnection queue. The study concluded that the addition of the Greater Bay Area Transition Cluster Group Phase II projects would cause normal overloads and emergency overloads. Section 7.1 of the Transition Cluster Phase II

Interconnection Study listed details of the Power Flow study results and proposed mitigation measures (CH2MHILL 2010y Section 7.1, CH2MHILL 2010ad Section 4).

Under Normal Overloads (N-0) Condition:

The Power Flow study indicated that the Greater Bay Area Transition Cluster Group would cause the following transmission line overloads under normal operation condition using the 2013 summer peak and 2013 off-peak study cases.

- Contra Costa PP – Delta Pumps 230 kV line (Contra Costa – Windmaster section)
- Contra Costa PP – Delta Pumps 230 kV line (Windmaster – Delta Pumps section)
- Kelso – Tesla 230 kV line (Kelso – USWP Ralph section)
- Kelso – Tesla 230 kV line (USWP Ralph – Tesla section)
- Las Positas - Newark 230 kV line

Under Category B (N-1) Conditions:

The Power Flow study indicated that the Greater Bay Area Transition Cluster Group would cause six N-1overloads using 2013 peak and 2013 off-peak study cases.

- Birds Landing – Contra Costa 230 kV line
- Contra Costa PP – Contra Costa Sub 230 kV line
- Lone Tree – Cayetano 230 kV line (Lone Tree – USWP JW Ranch section)
- Lone Tree – Cayetano 230 kV line (USWP JW Ranch – Cayetano section)
- Kelso – Tesla 230 kV line (Kelso – USWP Ralph section)
- Kelso – Tesla 230 kV line (USWP Ralph – Tesla section)

Under Category B (N-2) Conditions:

The Power Flow study indicated that the Greater Bay Area Transition Cluster Group would cause six N-2 overloads using 2013 peak load and 2013 off-peak study cases.

- Kelso – Tesla 230 kV line (Kelso – USWP Ralph section)
- Kelso – Tesla 230 kV line (USWP Ralph – Tesla section)
- Lone Tree – Cayetano 230 kV line (Lone Tree – USWP JW Ranch section)
- Lone Tree – Cayetano 230 kV line (USWP JW Ranch – Cayetano section)
- Lambie – Birds Landing 230 kV line
- Vaca Dixon – Lambie 230 kV line

Mitigation:

Mitigation to the above transmission line overloads have been identified under two categories: **Reliablility Network Upgrades** and **Delivery Network Upgrades**. Reliability upgrades are required in order to meet system reliability standards for the interconnection of the projects in the studied cluster. Delivery network upgrades are required only when an interconnecting generator requests full delivery interconnection

service, often required in order to receive capacity payments or meet contractual requirements. OGS is a full delivery generator and thus delivery network upgrades identified for the generating cluster could be downstream impacts of the OGS.

Reliability Network Upgrades, transmission line rerate and installation of SPS are the recommended mitigation measures.

- Line rerate: Lone Tree – Cayetano 230 kV line would need to be rerated from 2 feet/second wind speed to 4 feet/second wind speed. This is a reasonable mitigation alternative that only requires wind speed monitoring and no additional downstream transmission facilities. There are two sections to the Lone Tree – Cayetano 230 kV line: the Lone Tree – USWP JW Ranch section and the USWP JW Ranch – Cayetano section. The Lone Tree – USWP JW Ranch section of the line is loaded at 86% before the addition of the Transition Cluster Group Phase II projects under N-1 conditions. The post project line loading is 105%, an increase line loading of 19%. The USWP JW Ranch – Cayetano section of the line is loaded at 86% before the addition of the Transition Cluster Group Phase II projects under N-1 conditions. The post project line loading is 104%, an increase line loading of 18%. The line rerate cost allocation for the OGS is approximately 63.5% which means that the OGS is the primary responsible party for this line rerate.
- Installation of SPS to drop OGS generation to mitigate following transmission line overloads. SPS would not require major downstream transmission facility upgrades.

  1. Contra Costa PP – Contra Costa Sub 230 kV line. The line is loaded at 101% before the addition of the Transition Cluster Group Phase II projects under N-1 conditions. The post project line loading is 171%, an increase line loading of 70%. The SPS cost allocation for the OGS is approximately 89.3% which means that the OGS is a primary responsible party.

  2. Birds Landing – Contra Costa 230 kV line. The line is loaded at 92% before the addition of the Transition Cluster Group Phase II projects under N-1 conditions. The post project line loading is 129%, an increase line loading of 37%. The SPS cost allocation for the OGS is approximately 89.3% which means that the OGS is the primary responsible party.

  3. Vaca – Lambie 230 kV line. The line is loaded at 81% before the addition of the Transition Cluster Group Phase II projects under N-2 conditions. The post project line loading is 137%, an increase line loading of 56%. The SPS cost allocation for the OGS is approximately 89.3% which means that the OGS is the primary responsible party.

  4. Lambie – Birds Landing 230 kV line. The line is loaded at 63% before the addition of the Transition Cluster Group Phase II projects under N-2 conditions. The post project line loading is 119%, an increase line loading of 56%. The SPS cost allocation for the OGS is approximately 89.3% which means that the OGS is the primary responsible party.

Under the Delivery Network Upgrades, the Phase II Study recommends reconductoring overloaded transmission lines to allow for the full delivery of generation.

The reconductoring of existing transmission lines owned by PG&E would be licensed by the California Public Utilities Commission (CPUC). Through the CPUC licensing process environmental impacts would be identified and, where necessary, mitigated. Reconductoring would be a reasonably foreseeable consequence of the OGS and a general environmental analysis of the reconductoring should be included in Staff's final assessment of the OGS.

- Contra Costa PP – Delta Pumps 230 kV line

  Reconductor the 18.3 mile-long Contra Costa PP – Delta Pumps 230 kV line (Contra Costa – Windmaster: 16.5 miles and Windmaster – Delta Pumps: 1.8 miles) with a higher capacity conductor. This line is loaded at 71% before the addition of the Transition Cluster Group Phase II projects under normal operation conditions. With the addition of the generators in the cluster, the line loading is 122%, an increase line loading of 51%. The cost allocation for the OGS is approximately 79.6% which means that the OGS is the primary responsible party for this line reconductoring and that even if all the other projects in the cluster were never built; reconductoring would likely be required for the OGS.

- Kelso – Tesla 230 kV line

  Reconductor the 8 mile-long Kelso – Tesla 230 kV line (Kelso – USWP Ralph: 3.3 miles and USWP Ralph – Tesla: 4.7 miles) with a higher capacity conductor. The Kelso – USWP Ralph section of the line is loaded at 36% before the addition of the Transition Cluster Group Phase II projects under normal operation conditions. With the addition of the generators in the cluster, the line loading is 105%, an increase line loading of 69%. The USWP Ralph – Tesla section of the line is loaded at 38% before the addition of the Transition Cluster Group Phase II projects under normal operation conditions. With the addition of the generators in the cluster, the line loading is 107%, an increase line loading of 69%. The cost allocation for the OGS is approximately 34.9% which means that the OGS is partly responsible for this line reconductoring.

- Las Positas - Newark 230 kV line

  Reconductor the 21 mile-long Las Positas - Newark 230 kV line with a higher capacity conductor. This line is loaded at 85% before the addition of the Transition Cluster Group Phase II projects under normal operation conditions. With the addition of the generators in the cluster, the line loading is 113%, an increase line loading of 31%. The cost allocation for the OGS is approximately 79.7% which means that the OGS is the primary responsible party for this line reconductoring and that even if all the other projects in the cluster were never built; reconductoring would likely be required for the OGS.

Short Circuit Study Results, Mitigation Measures and Substation Evaluation

Short Circuit studies were performed to determine the degree to which the addition of the Greater Bay Area Transition Cluster Group Phase II projects increase fault duties at PG&E's substations, adjacent utility substations, and the other 70 kV, 115 kV, 230 kV and 500 kV busses within the study area. The fault duties were calculated with and without the Greater Bay Area Transition Cluster Group Phase II projects to identify any equipment overstress conditions. Buses electrically adjacent to Transition Cluster

projects and their short circuit duties are listed in Appendix E. The short circuit duties related just the OGS are listed in Attachment 4. The short circuit initial study identified that the OGS contributes more than the threshold value of 100 Amps to the circuit breaker 672 in the Pittsburg PP 230 kV Switching Station. A replacement of circuit breaker 672 with a higher rating circuit breaker would be required (CH2MHILL 2010ad Section, CH2MHILL 2010y Attachment 4).

Transient Stability Study Results and Mitigation Measures

Transient stability studies were conducted using the 2013 summer peak full loop base cases to ensure that the transmission system remained in operating equilibrium, as well as operating in a coordinated fashion, through abnormal operating conditions after the Phase II Transition Cluster projects became operational. Disturbance simulations were performed for a study period of 10 seconds to determine whether the Transition Cluster projects would create any system instability during line and generator outages. The Transient Stability study result indicated that the OGS would not cause adverse impacts on the stable operation of the transmission system following the selected Category “B” and Category “C” outages (CH2MHILL 2010ad Section 7).

Reactive Power Deficiency Analysis Results

Reactive power deficiency analysis was performed to determine the system performance according to the NERC/WECC planning criteria. The reactive power deficiency analysis indicated that the addition of the Transition Cluster projects including the OGS would not contribute to any reactive power margin violations at PG&E buses following selected Category “B” and Category “C” contingencies (CH2MHILL 2010ad Section 6)

CUMULATIVE IMPACTS

The TSE analysis focuses on whether or not a proposed project will meet required codes and standards. At all times the transmission grid must remain in compliance with reliability standards, whether one project or many projects interconnect. Potential cumulative impacts on the transmission network are identified through the California ISO and utility generator interconnection process. In cases where a significant number of proposed generation projects could affect a particular portion of the transmission grid, the interconnecting utility or the California ISO can study the cluster of projects in order to identify the most efficient means to interconnect all the proposed projects.

COMPLIANCE WITH LORS

The proposed interconnecting facilities including the OGS 230 kV switchyard, a single 230 kV overhead generator tie-lines, and termination to the proposed PG&E Contra Costa Substation are adequate and in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering LORS.

Staff proposed conditions of certification **TSE-1** through **TSE-7** would help ensure that construction and operation of the transmission facilities for the proposed OGS would comply with applicable LORS.

The Phase II Interconnection Study indicates that the project interconnection would comply with all NERC/WECC planning standards and California ISO reliability criteria as long as the identified Reliability Network Upgrades are implemented.

CONCLUSIONS AND RECOMMENDATIONS

The proposed interconnection facilities including the OGS 230 kV switchyard, single 230 kV overhead generator tie-line, and termination to the proposed PG&E Contra Costa Substation are adequate and in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering LORS.

- The interconnection of the OGS will cause new transmission line overloads under normal and contingency conditions. Mitigation includes installation of SPS, rerate transmission line, and reconductoring the overloaded transmission lines. The applicant is partially responsible for the transmission system upgrades.
    - The reconductoring of the following lines should be considered a reasonably foreseeable consequence of the interconnection of the OGS and a general environmental analysis should be included in Staff's final assessment:
        - 18. 3 mile-long Contra Costa PP – Delta Pumps 230 kV transmission line reconductoring
        - 8 mile-long Kelso – Tesla 230 kV line transmission line reconductoring
        - 21 mile-long Las Positas - Newark 230 kV transmission line reconductoring.
- The interconnection of the project will require replacement of the circuit breaker at Pittsburg PP Switching Station. Other existing breakers are adequate to withstand the post project incremental fault currents described in the Short Circuit Study.

PROPOSED CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: Prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up transformer
Switchyard
Busses
Surge arrestors
Disconnects
Take-off facilities
Electrical control building
Switchyard control building
Transmission pole/tower
Grounding system

TSE-2 Before the start of construction, the project owner shall assign to the project an electrical engineer and at least one of each of the following:

a) a civil engineer;

b) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;

c) a design engineer who is either a structural engineer or a civil engineer and fully competent and proficient in the design of power plant structures and equipment supports; or

d) a mechanical engineer (Business and Professions Code Sections 6704 et seq. require state registration to practice as either a civil engineer or a structural engineer in California).

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers as long as each engineer is responsible for a particular segment of the project, e.g., proposed earthwork, civil structures, power plant structures, or equipment support. No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical, or civil and design engineer, assigned as required by Facility Design Condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO, for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earth work and require changes; if site conditions are unsafe or do not

conform with the predicted conditions used as the basis for design of earth work or foundations.

The electrical engineer shall:

1. be responsible for the electrical design of the power plant switchyard, outlet, and termination facilities; and

2. sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: Prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action (2001 California Building Code, Chapter 1, section 108.4, approval required; Chapter 17, section 1701.3, *Duties and Responsibilities of the Special Inspector;* Appendix Chapter 33, section 3317.7, *Notification of Noncompliance*). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and refer to this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for the disapproval, along with the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any construction until plans for that increment of construction have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the monthly compliance report:

a) receipt or delay of major electrical equipment;

b) testing or energization of major electrical equipment; and

c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: Prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, and outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer verifying compliance with all applicable LORS, and send the CPM a copy of the transmittal letter in the next monthly compliance report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, and the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations, as determined by the CBO. Once approved, the project owner shall inform the CPM and CBO of any anticipated changes to the design, and shall submit a detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change to the CPM and CBO for review and approval.

a) The power plant 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*, California ISO standards, National Electric Code (NEC) and related industry standards.

b) Breakers and busses in the power plant 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) The project conductors shall be sized to accommodate the full output of the project.

e) Termination facilities shall comply with applicable PG&E interconnection standards.

f) The project owner shall provide to the CPM:

   i) The Special Protection System (SPS) sequencing and timing if applicable,

   ii) A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable,

iii) A copy of the executed LGIA signed by the California ISO and the project owner and approved by the Federal Energy Regulatory Commission.

Verification: Prior to the start of construction or start of modification of transmission facilities, the project owner shall submit to the CBO for approval:

a) Design drawings, specifications, and calculations conforming with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*, CA ISO standards, National Electric Code (NEC) and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment;

b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"[1] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or 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*, California ISO standards, National Electric Code (NEC), and related industry standards;

c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in charge, a route map, and an engineering description of the equipment and configurations covered by requirements **TSE-5** a) through f);

d) The Special Protection System (SPS) sequencing and timing if applicable shall be provided concurrently to the CPM.

e) A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable,

f) A copy of the executed LGIA signed by the California ISO and the project owner and approved by the Federal Energy Regulatory Commission.

Prior to the start of construction of or modification of transmission facilities, the project owner shall inform the CBO and the CPM of any anticipated changes to the design that are different from the design previously submitted and approved and shall submit a detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change to the CPM and CBO for review and approval.

[1] Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

TSE-6 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) 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 California ISO a letter stating the proposed date of synchronization; and

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

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. The project owner shall contact the California 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 California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-7 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

a) "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards.

b) An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge

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NERC (North American Electric Reliability Council). 2006. Reliability Standards for the Bulk Electric Systems of North America, May 2 2006.

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WECC (Western Electricity Coordinating Council). 2002. NERC/WECC Planning Standards, August 2002.

DEFINITION OF TERMS

AAC	All aluminum conductor.
ACSR	Aluminum conductor steel-reinforced.
ACSS	Aluminum conductor steel-supported.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
Ampere	The unit of current flowing in a conductor.
Bundled	Two wires, 18 inches apart.

Bus — Conductors that serve as a common connection for two or more circuits.

Conductor — The part of the transmission line (the wire) that carries the current.

Congestion management — A scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.

Double–contingency condition — Also known as emergency or N-2 condition, a forced outage of two system elements usually (but not exclusively) caused by one single event. Examples of an N-2 contingency include loss of two transmission circuits on a single tower line or loss of two elements connected by a common circuit breaker due to the failure of that common breaker.

Emergency overload — See single–contingency condition. This is also called an N-1 condition.

kcmil — One-thousand circular mil. A unit of the conductor's cross-sectional area divided by 1,273 to obtain the area in square inches.

Kilovolt (kV) — A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.

Loop — An electrical cul-de-sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection, and returns it back to the interrupted circuit, thus forming a loop or cul-de-sac.

Megavar — One megavolt ampere reactive.

Megavars — Mega-volt-ampere-reactive. One million volt-ampere-reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA) — A unit of apparent power equal to the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW) — A unit of power equivalent to 1,341 horsepower.

N-0 condition — See normal operation/normal overload.

Normal operation/normal overload (N-0) — When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 condition — See single–contingency condition.

N-2 condition — See double–contingency condition.

Outlet — Transmission facilities (e.g., circuit, transformer, circuit breaker) linking generation facilities to the main grid.

Power flow analysis — A power flow analysis is a forward-looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers, and other equipment and system voltage levels.

Reactive power

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial action scheme (RAS)
: A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6
: Sulfur hexafluoride is an insulating medium.

Single–contingency condition
: Also known as emergency or N-1 condition, occurs when one major transmission element (e.g., circuit, transformer, circuit breaker) or one generator is out of service.

Solid dielectric cable
: Copper or aluminum conductors that are insulated by solid polyethylene-type insulation and covered by a metallic shield and outer polyethylene jacket.

Special protection scheme/system (SPS)
: An SPS detects a transmission outage (either a single or credible multiple contingency) or an overloaded transmission facility and then trips or runs back generation output to avoid potential overloaded facilities or other criteria violations.

Switchyard
: A power plant switchyard is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating
: See ampacity.

TSE
: Transmission System Engineering.

Tap
: A transmission configuration creating an interconnection through a sort single circuit to a small- or medium-sized load or generator. The new single circuit line is inserted into an existing circuit by using breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing
: A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild
: A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Suzanne Phinney, D.Env.

SUMMARY OF CONCLUSIONS

In the analysis of the Oakley Generating Station (OGS), environmental impacts can be mitigated to less than significant with the exception of air quality and biological resources, where staff is not able to make a determination at this time. The OGS applicant has not identified the specific emissions reductions they would use to mitigate the proposed project's air quality impacts nor have they demonstrated that they control sufficient emissions reductions.

Regarding biological resources, staff is awaiting information from the applicant regarding removal of trees and feedback anticipated from the East Contra Costa County Habitat Conservancy (Conservancy) on the applicant's submittal of a Planning Survey Report (PSR). Feedback is required from the Conservancy as the implementing entity for the East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (ECCC HCP/NCCP). Construction of the OGS requires take authorization for federally listed species, which may be achieved through the ECCC HCP/NCCP to demonstrate compliance with the federal Endangered Species Act and Natural Community Conservation Planning Act (NCCPA) for covered species.

To avoid potential environmental concerns and for full consideration of a reasonable range of alternatives, five alternative project sites were examined. Several alternative generation technologies were also evaluated. While some of the alternative sites could achieve project objectives, they do not have any environmental advantages over the proposed site or would have disadvantages (e.g. longer gas and transmission interconnections, greater visual presence, closer to receptors). All alternative sites would require emissions reductions and the ability to mitigate would be similar to the OGS.

The alternative technologies would either not be feasible in the project area or would not generate the power equivalent of the proposed project. The alternative linear routes are feasible but present no clear advantage. With no significant issues at this time, staff does not recommend an alternative over the project as proposed.

Staff also believes that the "no project" alternative is not superior to the proposed project. The "no project" scenario could lead to increased operation of existing plants (and reliance on older, more polluting technology) or development of new plants on undeveloped (greenfield) land. In addition, conservation and demand side management programs would likely not meet the state's growing electricity needs that could be served by the OGS.

At this time, staff does not recommend an alternative site, generation technology, or configuration over the project proposed by Contra Costa Generating Station, LLC.

INTRODUCTION

This section considers potential alternatives to the construction and operation of the proposed Oakley Generating Station (OGS). The purpose of this alternatives analysis is analyze a reasonable range of feasible alternatives which could substantially reduce or avoid any potentially significant adverse impacts of the proposed project (Cal. Code Regs., tit. 14, §15126.6; Cal. Code Regs., tit. 20, §1765). Although staff cannot make a determination as to the significance of air quality impacts, for the other environmental issue areas, impacts can be mitigated to less than significant. This section analyzes different technologies and alternative sites that may reduce or avoid concerns raised by interested parties during the siting process. Staff has also analyzed the impacts that may be created by locating the project at alternative sites.

The Energy Commission does not have the authority to approve an alternative or require Contra Costa Generating Station, LLC to move the proposed project to another location, even if it identifies an alternative site that meets the project objectives and avoids or substantially lessens one or more of any significant effects of the project.

Implementation of an alternative site would require that the applicant submit a new Application for Certification (AFC), including revised engineering and environmental analysis; this more rigorous AFC-level analysis of any of the alternative sites could reveal environmental impacts, non-conformity with laws, ordinances, regulations, and standards; or potential mitigation requirements that were not identified during the more general alternatives analysis presented herein.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

As specified in the Warren-Alquist Act, sections 25523 and 25525, the California Energy Commission (Energy Commission) must find that a project complies with all applicable laws, ordinances, regulations, and standards (LORS). In addition, the Energy Commission generally acts as the Lead Agency under the California Environmental Quality Act (CEQA) for purposes of licensing thermal power plants. Under CEQA, Energy Commission staff is required by agency regulations to examine the “feasibility of available site and facility alternatives to the applicant’s proposal which substantially lessen the significant adverse impacts of the proposal on the environment.” (Cal. Code Regs., tit. 20, § 1765).

The “Guidelines for Implementation of the California Environmental Quality Act,” Title 14, California Code of Regulations, section 15126.6(a), requires an evaluation of the comparative merits of “a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project.”

In addition, the analysis must address the “no project” alternative (Cal. Code Regs., tit. 14, § 15126.6, subd. (e).) The analysis should identify and compare the impacts of the various alternatives, but analysis of alternatives need not be in as much detail as the analysis of the proposed project.

The range of alternatives is governed by the “rule of reason,” which requires consideration only of those alternatives necessary to permit informed decision making and public participation. CEQA states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative. (Cal. Code Regs., tit. 14, § 15126.6, subd. (f)(3).) However, if the range of alternatives is defined too narrowly, the analysis may be inadequate. (City of Santee v. County of San Diego (4th District 1989) 214 Cal. App.3d 1438.)

PROJECT DESCRIPTION AND SETTING

Contra Costa Generating Station, LLC (wholly owned by Radback Energy, Inc.) proposes a 624 MW natural gas-fired combined-cycle combustion turbine facility in Contra Costa County within the city limits of Oakley. The OGS would consist of two nominally-rated 213-MW General Electric Frame 7FA combustion turbine generators (CTGs), plus a single condensing steam turbine generator (STG). Associated equipment would include an air-cooled condenser, selective catalytic reduction (SCR), and oxidation catalyst emission control systems.

The OGS would be situated on an approximate 22-acre parcel currently farmed for wine grapes; the California Department of Conservation designates the site as Farmland of Statewide Importance. However, the site falls within a designated urban growth boundary, and is zoned H-1, Heavy Industrial by the City of Oakley, which is consistent with the Utility Energy General Plan land use designation. It is south of the former DuPont facility, and included within the DuPont Specific Plan as a redevelopment area. The property is proposed for Utility Energy zoning on the City Redevelopment planning map.

The site is primarily surrounded by existing industrial uses. The site is bordered to the west by PG&E’s Antioch Terminal, a major high-pressure natural gas transmission pipeline hub; to the north by DuPont property that is either industrial or vacant industrial; to the east by DuPont’s titanium dioxide landfill area; and to the south by the Atchison, Topeka and Santa Fe railroad (also known as the Burlington Northern Santa Fe [BNSF]). South of the railroad is an agricultural parcel, on which a 74.6-acre commercial development has been proposed. A project at the site would be visible from most directions; however the industrial nature of the area would lessen viewer sensitivity. The nearest residences are located in the Sandy Point (Shady Haven) Mobile Home Park, approximately 800 feet to the southwest. The nearest school, Bounton-Shaw Academy, is located 0.4 miles to the southwest. The Antioch Dunes – supporting 14 special-status and/or endemic species, including the last known natural populations of Lange’s metalmark butterfly (*Apodemia mormo langei),* Antioch Dunes evening primrose *(Oenothera deltoides ssp. howellii)*, and Contra Costa wallflower (*Erysimum capiatum var. angustatum*) – is located on the shores of the San Joaquin River, approximately 2.5 miles west of the proposed site.

The OGS would interconnect to PG&E’s Contra Costa Substation via an existing 2.0-mile transmission corridor, extending south from the OGS (on the east side of Highway 160) and then due west (running north of Oakley Road). The existing 60-kV steel lattice towers in the corridor would be replaced by new monopole towers carrying

a 230-kV transmission line from the OGS to the substation. The 60-kV line would be either co-located on the monopole structures or replaced by the 230-kV line. Natural gas would be obtained from PG&E Line 303 (located in the southeastern portion of the Antioch Terminal) via an approximately 140-foot long, 6- to 10-inch diameter connection to the gas metering station. The project owner may also choose to include a similar secondary natural gas supply connection from Line 400 (in the northeastern portion of the Antioch Terminal).

The OGS would require about 240 acre-feet of water per year (AFY) for plant cooling and process water, fire protection, and potable uses. The Diablo Water District would supply potable water for these purposes via an existing 24-inch diameter distribution pipeline that runs north-south through the OGS site (just east of PG&E's Antioch Terminal). The Ironhouse Sanitary District (ISD) is currently constructing a wastewater treatment plant, 2.5 miles to the east of the site. Within three years of commencing operations, the OGS will be required to shift to tertiary treated water supplied by the wastewater treatment plant. The OGS would annually discharge approximately 43 million gallons of wastewater into a new 0.44-mile force main that would be constructed in Bridgehead Road and Main Street parallel to an existing ISD sewer line.

DETERMINING THE SCOPE OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternative analysis is to determine the potential significant impacts of the OGS and then focus on alternatives that are capable of reducing or avoiding these impacts.

To prepare this alternative analysis, staff used the methodology summarized below:

- Describe the basic objectives of the project.
- Identify any potential significant environmental impacts of the project.
- Identify and evaluate alternative locations or sites to determine whether the environmental impacts of the alternatives are the same, better, or worse than the proposed project.
- Identify and evaluate technology alternatives to the project which would mitigate impacts.
- Evaluate the impacts of not constructing the project to determine whether the "no project" alternative is superior to the project as proposed.

In considering site alternatives, staff determined a reasonable geographical area. Since alternatives must consider the underlying objectives of the proposed project, staff confined the geographic area for site alternatives to Contra Costa County and within reasonable proximity of transmission, gas, and water infrastructure. These location alternatives are generally consistent with CCGS, LLC's objectives and siting criteria:

- Consistency with general plans and zoning ordinances;
- Brownfield or industrial site preferred;
- Adequate size and configuration;

- Proximity to existing transmission and gas infrastructure;
- Located near demand centers; and
- Ability to have no significant impact on the environment.

Alternative generation technologies, as discussed in this analysis, include both methods to reduce the demand for electricity and alternative methods to generate electricity.

BASIC OBJECTIVES OF THE PROJECT

After studying CCGS, LLC's AFC (OG 2009a), Energy Commission staff has determined the OGS objectives to be:

- Provide efficient, reliable, and predictable power supply capable of supporting the growing power needs of the Bay Area;
- Provide operational flexibility and rapid-start and dispatch capability;
- Site the project within the area of electrical demand and near existing infrastructure, thus minimizing the project's linear facilities; and
- Site the project on a brownfield or industrial site.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT

Environmental impacts can be mitigated to less than significant with the exception of air quality and biological resources, where staff is not able to make a determination at this time.

SITE ALTERNATIVES TO THE PROJECT

This section evaluates the alternative sites identified by CCGS, LLC. Staff has determined that the applicant-identified sites provide a range of reasonable alternative locations and therefore staff has not identified additional sites.

Staff considered the following criteria in reviewing potential alternative sites:

1. Avoid or substantially lessen one or more of the potential significant effects of the project; and
2. Satisfy the following criteria:
    a. Site suitability. Approximately 22 acres are required for the site at its proposed location. The shape of the site also affects its usability;
    b. Availability of infrastructure. The site should be within a reasonable distance of transmission, natural gas, and water connections. Lengthy infrastructure would increase the potential for environmental impacts;
    c. Brownfield or industrial site;

d. Compliance with general plan designation and zoning district; and

e. Availability of the site.

SITES IDENTIFIED BY THE APPLICANT FOR FURTHER ANALYSIS

In the OGS AFC (OG 2009a), the applicant identified four sites in the vicinity of the proposed OGS. For all sites, acquisition would be required, as CCGS, LLC does not have ownership. Staff used aerial imagery, property information, and the AFC, and conducted a drive-by of parcels on September 7, 2010, to analyze the alternative sites.

The alternative sites are shown on **Alternatives Figure 1**. Since proximity to transmission lines and the Antioch gas terminal are important considerations for assessing alternative sites, these are also shown on the figure.

OGS Alternative 1: 18th Street Site

The 18th Street Site is in the City of Antioch, 0.6 miles southwest of the proposed OGS site. It is located on 26 vacant acres of previously farmed land on the north side of 18th Street, just west of Drive-In Way. The site is adjacent to commercial uses, including a self-storage facility, automobile salvage yard, and fast-food eatery. The nearest residence is on the south side of 18th Street, 120 feet south of the project. The nearest school is located 0.25 miles to the east. The site is zoned Planned Business Center and Planned Development District; a General Plan amendment would be needed for the project. Site control is unknown.

A project at the site could obtain potable water from the City of Antioch by tapping into a line in place for the Gateway Generating Station. Recycled water and wastewater would likely be managed by the Delta Diablo Sanitary District (DDSD). A 4.7-mile recycled water connection would connect to the DDSD's treatment plant, located at 2500 Pittsburg-Antioch Highway in Antioch. A 2.1 mile transmission connection, partially following existing corridors, would connect to the Contra Costa Substation; the most likely route would be east along 18th Street to join the existing 60-kV transmission line corridor that would be used for the proposed project. A 0.6-mile natural gas pipeline could potentially run east along 18th Street and north on Bridgehead Road to connect to the Antioch Terminal. A comparison of the 18th Street Alternative Site with the OGS site follows:

- **Linear Facilities.** The 18th Street Alternative would require a transmission connection to the Contra Costa Substation of similar length as the proposed project. However approximately 0.2 miles would be along heavily travelled 18th Street, not within an existing transmission line corridor. A 0.6-mile gas pipeline would be needed to tie into Antioch Terminal, whereas the proposed site would be adjacent to the terminal.
- **Air Quality.** The 18th Street Alternative is located within the same air basin, and the type and quantity of air emissions would be similar to the OGS. Receptors would be only 120 feet away at this site (versus 800 at the proposed site). Due to this proximity, there would be slightly greater impacts from air emissions. The ability to obtain emissions reductions would be similar to the OGS.

- **Biological Resources.** Both the 18th Street and proposed OGS sites have the potential for limited biological resources. The 18th Street alternative site is undeveloped (but previously farmed) land in proximity to actively farmed fields. In comparison, the proposed site is a currently farmed vineyard, with a 0.62-acre mitigation wetland located on the western portion of the site. Since the wetland area would be avoided, impacts to biological resources at the site would be similar. As with the proposed site, nitrogen deposition impacts to the Antioch Dunes could be mitigated to less than significant.
- **Cultural Resources.** The 18th Street site has been previously farmed, reducing the potential for undisturbed cultural resources. Although the alternative site has not been surveyed, cultural resource impacts would likely be similar to the proposed OGS site, where there are no known significant cultural resources.
- **Geological Resources and Hazards.** Effects of the project on geological resources and hazards are expected to be minimal and would be similar to the OGS site.
- **Hazardous Materials.** Hazardous material handling would be similar for the 18th Street site and the proposed OGS location. In addition, the differences in the distances and types of roads for transport of hazardous materials would be minor.
- **Land Use and Agriculture.** Impacts to agricultural resources would be similar. The 18th Street site is designated as Farmland of Statewide Importance (30%) and Other (70%), and is not under a Williamson Act contract. The OGS site is designated as Farmland of Statewide Importance, but is in a designated urban growth boundary. The 18th Street site is zoned Planned Business Center and Planned Development District. Power plants are not an approved use and a General Plan amendment would be required. Overall land use impacts would thus be greater for the 18th Street alternative than the proposed OGS site, which is zoned H-1, Heavy Industrial.
- **Noise.** A project located at the 18th Street alternative site would be about 120 feet from the nearest residence, compared to 800 feet for the OGS site. In addition, the alternative site is adjacent to commercial facilities, whereas the OGS site is surrounded by industrial facilities to the east, north, and west. Noise impacts would be slightly greater.
- **Paleontology.** Paleontological resources are not likely to be impacted at the 18th Street or proposed OGS site.
- **Public Health.** The project is unlikely to cause significant long-term public health impacts at either site.
- **Socioeconomics.** The 18th Street and OGS sites would draw similar numbers of workers, primarily from Contra Costa and other counties in the Delta region. For either site, most workers would commute, with a few possibly moving temporarily to the local area during construction. Local socioeconomic impacts to the region would be similar.
- **Soils.** The 18th Street site has not been farmed in several years, whereas the proposed OGS site is an active vineyard. With best management practices for soil erosion, impacts to soil resources are expected to be similar.
- **Traffic and Transportation.** Both sites are directly accessed by collector boulevards from Highway 160, and could use the 18th Street and Wilbur Avenue

offramps. However, the alternative site would use a busy stretch of 18th Street, for slightly greater traffic and transportation impacts.

- **Visual Resources.** The 18th Street site is located in a relatively industrialized area, which includes the Gateway Generating Station and Contra Costa Power Plant. It would be directly visible to residences from the south. The proposed OGS site would also be visible to viewers from the south and east, where there are currently undeveloped parcels. However, the OGS site is further from residences and more closely surrounded by heavy industrial uses, for slightly less overall visual impacts than the 18th Street site. The two sites would have similar visual impacts from transmission and other linear infrastructure.
- **Water Resources.** A facility at the 18th Street site would also use air-cooled condensing, and would require similar water quantities as the proposed project. With a connection of 500 feet or less, a project at the alternative site could tap into potable line from the City of Antioch that is in place for Gateway Generating Station. The Delta Diablo Sanitary District would likely supply recycled water and manage wastewater. A 4.7-mile recycled water connection would connect to the DDSD's treatment plant
- **Waste Management.** Similar quantities of waste would be generated at the 18th Street alternative site and at the OGS site.
- **Worker Safety.** No differences are expected with respect to worker safety at the 18th Street site or proposed OGS site.

OGS Alternative 2: Wilbur Avenue Site

The 29-acre alternative site is located approximately 0.5 miles to the west of the OGS. It contains active vineyards, and is located between the BNSF railroad tracks to the south and Wilbur Avenue to the north. PG&E transmission corridors diagonally traverse the western portion of the site, limiting the amount of space available for project construction. The Contra Costa Power Plant is immediately north, and PG&E's Gateway Generating Station is to the northeast. There are other industrial uses to the east (Budweiser facility) and west, and agriculture to the south. The currently farmed site is zoned Heavy Industrial and is under the jurisdiction of unincorporated Contra Costa County. The nearest residence is located approximately 1,200 feet west of the site, and the nearest school (Bouton-Shaw Academy) is 0.48 miles to the southeast. Site control is unknown.

A project at this site could tap into a City of Antioch water pipeline in place for the Contra Costa Power Plant, with a connection of less than 500 feet. To obtain recycled water, a 3.7-mile connection would be required to the ISD treatment plant, or a 4.4-mile connection to the DDSD treatment plant. A 2.4-mile transmission interconnection would connect to the Contra Costa Substation; the transmission route could travel east along the BNSF railroad tracks to join the existing corridor that would be used for the proposed site. A 0.5-mile natural gas line running east along Wilbur Road and then south on Bridgehead Road would tie into the Antioch Terminal. A comparison of the Wilbur Avenue Alternative site with the OGS site follows:

- **Linear Facilities.** The Wilbur Avenue Alternative would require a slightly longer transmission connection (2.4 miles) than the proposed project (2.0). A 0.5-mile gas

pipeline would be needed to tie into Antioch Terminal, whereas the proposed site would be adjacent to the terminal.

- **Air Quality.** The Wilbur Avenue Alternative is located within the same air basin, and the type and quantity of air emissions would be similar to the OGS. Receptors would be 1,200 feet away at this site, and air quality impacts would be similar. The ability to obtain emissions reductions would be similar to the OGS.
- **Biological Resources.** The Wilbur Avenue site is actively farmed, with limited habitat supporting biological resources. Impacts to biological resources would be similar at the proposed site, which is a current vineyard adjacent to a 0.62-acre mitigation wetland. Nitrogen deposition to the Antioch Dunes could also be mitigated to less than significant.
- **Cultural Resources.** The Wilbur Avenue site is farmed, reducing the potential for undisturbed cultural resources. Although the alternative site has not been surveyed, cultural resource impacts would likely be similar to the proposed OGS site, where there are no known significant cultural resources.
- **Geological Resources and Hazards.** Effects of the project on geological resources and hazards are expected to be minimal and would be similar to the OGS site.
- **Hazardous Materials.** Hazardous material handling would be similar for the Wilbur Avenue site and the proposed OGS location. In addition, the differences in the distances and types of roads for transport of hazardous materials would be minor.
- **Land Use and Agriculture.** The Wilbur Avenue site is zoned Heavy Industrial, which is intended to allow most heavy manufacturing uses. It is designated as Unique Farmland (50%) and Farmland of Local Importance (50%), and is not under a Williamson Act contract. The proposed OGS site is zoned H-1, Heavy Industrial. It is designated as Farmland of Statewide Importance, but is in a designated urban growth boundary. Both sites would have similar impacts to land use and agricultural resources.
- **Noise.** A project located at the Wilbur Avenue alternative location would be about 1,200 feet from the nearest residence, compared to 800 feet for the OGS site. Both sites are adjacent to industrial facilities, for similar noise impacts.
- **Paleontology.** Paleontological resources are not likely to be impacted at the Wilbur Avenue or proposed OGS site.
- **Public Health.** The project is unlikely to cause significant long-term public health impacts at either site.
- **Socioeconomics.** The Wilbur Avenue and OGS sites would draw similar numbers of workers, primarily from Contra Costa and other counties in the Delta region. For either site, most workers would commute, with a few possibly moving temporarily to the local area during construction. Local socioeconomic impacts to the region would be similar.
- **Soils.** Both the Wilbur Avenue and proposed OGS sites are active vineyards, with flat topography. Impacts to soil resources are expected to be similar.

- **Traffic and Transportation.** Both sites are directly accessed by collector boulevards from Highway 160 and could use the Wilbur Avenue offramp. Traffic impacts would be similar, with mitigation required during peak construction traffic.
- **Visual Resources.** The Wilbur Avenue site is located in a relatively industrialized area, with heavy industry to the north and east. It would be directly visible to residences from the south, and have similar visual impacts as the proposed site. The two sites would also have similar impacts from transmission and other linear infrastructure.
- **Water Resources.** The Wilbur Avenue site would also use air-cooled condensing, and would require similar water quantities as the proposed project. With a connection of 500 feet or less, a project at the alternative site could tap into the potable water line from the City of Antioch that is in place for the Contra Costa Power Plant. To obtain recycled water, a 3.7-mile connection would be required to the ISD treatment plant, or a 4.4-mile connection to the DDSD plant.
- **Waste Management.** Similar quantities of waste would be generated at the Wilbur Avenue alternative site in comparison to the OGS site.
- **Worker Safety.** No differences are expected with respect to worker safety at the Wilbur Avenue or proposed OGS sites.

OGS Alternative 3: Riverfront Site

This 80-acre site (APN 051031005) is located 1.1 miles west of the OGS, on the north side of Wilbur Avenue. The site is bordered by the Contra Costa Power Plant (where the Marsh Landing Generating Station will be constructed) to the east, San Joaquin River to the north, Gaylord Container Facility to the west, and an undeveloped parcel to the south. The site is currently undeveloped, and characterized by weeds, scattered trash, and broken pavement. Four drums are visible from the road. Signage on the fence states “no smoking in vehicles,” possibly indicating the presence of combustible substances. It is zoned Heavy Industrial and is located in the unincorporated county. The nearest residence is located about 480 feet to the south, opposite the BNSF railroad; the nearest school is 0.52 miles to the southwest. According to the applicant, the owners of the site are unwilling to sell or lease the site. The site, however, appears to be for sale.

Water for a project at this site would be provided by tapping into an existing pipeline to the Contra Costa Power Plant, via a 500-foot connection. If the project were to obtain recycled water from the ISD treatment plant, a 4.3-mile connection would be required. Meanwhile, a 3.9-mile connection would be required to reach the DDSD treatment plant in Antioch. A 3.2-mile transmission line would connect to the Contra Costa Substation. The route could follow Wilbur Avenue east under Highway 160, and turn south on Bridgehead Road to meet the proposed site. It would then use the existing transmission corridor to the substation. A 1.1-mile natural gas line – potentially following Wilbur Avenue to the east and Bridgehead Road to the south – would tie into the Antioch Terminal. A comparison of the Riverfront and proposed OGS sites follows:

- **Linear Facilities.** The Riverfront Alternative would require a longer transmission connection (3.2 miles) than the proposed project (2.0 miles), and would use an existing corridor for only a portion of the length. A 1.1-mile gas pipeline would be

needed to tie into Antioch Terminal, whereas the proposed site would be adjacent to the terminal.

- **Air Quality.** The Riverfront Alternative is located within the same air basin, and the type and quantity of air emissions would be similar to the OGS. However, receptors would be slightly closer (500 feet) at this site, versus 800 feet at the proposed site. Overall impacts to air quality would be similar. The ability to obtain emissions reductions would be similar to the OGS.
- **Biological Resources.** The Riverfront site is heavily disturbed, but adjacent to the San Joaquin River, which is known to contain threatened and endangered species. Due to the river's proximity, mitigation and permitting for biological resources may be required to develop a power plant at the site. The site is adjacent to the proposed 930 MW Marsh Landing Generating Station and would add to cumulative impacts to biological resources at the Antioch Dunes; with mitigation, impacts would be less than significant. Overall impacts to biological resources would be slightly greater than at the proposed site.
- **Cultural Resources.** The Riverfront site's location on the San Joaquin River gives it a high sensitivity for cultural resources. The potential for impacts to cultural resources is therefore greater than at the proposed OGS site.
- **Geological Resources and Hazards.** Effects of the project on geological resources and hazards are expected to be minimal and would be similar to the OGS site.
- **Hazardous Materials.** Hazardous material handling could potentially be greater than for the proposed site. The proximity to other heavy industrial sites, and the possibility of combustible materials, could indicate the need for assessment and remediation. Differences in the distances and types of roads for transport of hazardous materials would be minor.
- **Land Use and Agriculture.** The Riverfront site is zoned Heavy Industrial, as is the proposed OGS site. The California Department of Conservation designates the Riverfront site as Urban and Built-Up under its Farmland Mapping and Monitoring Program; development would therefore not result in impacts to agricultural land. Overall, impacts would be similar to the proposed site.
- **Noise.** A project located at the Riverfront Alternative site would be about 500 feet from the nearest residence, compared to 800 feet for the OGS site. Both facilities are adjacent to industrial uses, and noise impacts would be similar.
- **Paleontology.** Paleontological resources are not likely to be impacted at either the Riverfront or proposed OGS site.
- **Public Health.** The project is unlikely to cause significant long-term public health impacts at either site.
- **Socioeconomics.** The Riverfront and OGS sites would draw similar numbers of workers, primarily from Contra Costa and other counties in the Delta region. For either site, most workers would commute, with a few potentially moving temporarily to the local area during construction. Local socioeconomic impacts to the region would be similar.

- **Soils.** The Riverfront site does not appear to be farmed, whereas the proposed OGS site is an active vineyard. With best management practices for soil erosion, impacts to soil resources are expected to be similar.
- **Traffic and Transportation.** Both sites are directly accessed by collector boulevards from Highway 160, and could use the Wilbur Avenue offramp. With mitigation during peak construction traffic, traffic and transportation impacts would be similar.
- **Visual Resources.** Similar to the proposed site, the Riverfront site is located in an industrialized area, with the Gateway Generating Station and Contra Costa Power Plant nearby. A power plant at this site would be directly visible to residences from the south. The two sites would also have similar impacts from transmission and other linear infrastructure.
- **Water Resources.** The Riverfront site would also use air-cooled condensing, and would require similar water quantities as the proposed project. With a connection of 500 feet or less, a project at the alternative site could tap into potable line from the City of Antioch that is in place for the Contra Costa Power Plant. If the project were to obtain recycled water from the ISD treatment plant, a 4.3-mile connection would be required. A recycled water connection to the DDSD plant would be 3.9 miles.
- **Waste Management.** Similar quantities of waste would be generated at the Riverfront alternative site in comparison to the OGS.
- **Worker Safety.** No differences are expected with respect to worker safety at the Riverfront site or proposed OGS site.

OGS Alternative 4: Sandy Lane Site

The 30-acre Sandy Lane site is located 0.6 miles south of the OGS, in the City of Oakley. It is on the north side of Oakley Road and east side of Sandy Lane. The site is actively farmed, and contains a large warehouse-type building in the southwest portion. The site and parcels immediately to the west, north, and east are zoned Light Industrial. The parcels include agricultural, residential, and light industrial uses. The nearest sensitive receptor is 120 feet to the south (opposite Oakley Road); other residences are on all sides of the site. Orchard Park Elementary School is 600 feet to the east. Site control is unknown.

Water for a project at this site would be provided by tapping into an existing line along Sandy Road. If that is unavailable, an approximately 0.9-mile connection would be required to tie into the DuPont water system. For recycled water, a 2.2 mile connection would be required to reach the ISD's treatment plant. Wastewater would be returned to the ISD. A 1.9-mile transmission line would connect to the Contra Costa Substation to the west; the route would travel west from the site along Oakley Road and then slightly north (east of Highway 160) to join the existing corridor that would be used for the proposed site. A 1.0-mile natural gas line would tie into the Antioch Terminal; running east from the site along Oakley Road, and then north on Bridgehead Road. A comparison of the Sandy Lane and proposed OGS sites follows:

- **Linear Facilities..** The Sandy Lane Alternative would require a transmission connection of similar length as the proposed project to the Contra Costa Substation.

However, the portion along Oakley Road would not be within an existing corridor. A 1.0-mile gas pipeline would be needed to tie into Antioch Terminal, whereas the proposed site would be adjacent to the terminal.

- **Air Quality.** The Sandy Lane Alternative is located within the same air basin, and the type and quantity of air emissions would be similar to the OGS. However, receptors would be significantly closer (120 feet) at this site, including a school 600 feet away. Impacts from air emissions would thus be greater than for the proposed site. The ability to obtain emissions reductions would be similar to the OGS.
- **Biological Resources.** The Sandy Lane site is actively farmed, and includes a large developed portion. With limited habitat supporting biological resources, impacts to biological resources would be similar to the proposed site. Nitrogen deposition on the Antioch Dunes could also be mitigated to less than significant.
- **Cultural Resources.** The Sandy Lane site has been previously farmed, reducing the potential for undisturbed cultural resources. Although the alternative site has not been surveyed, cultural resource impacts would likely be similar to the proposed OGS site, where there are no known significant cultural resources.
- **Geological Resources and Hazards.** Effects of the project on geological resources and hazards are expected to be minimal and would be similar to the OGS site.
- **Hazardous Materials.** Hazardous material handling would be similar for the Sandy Lane site and the proposed OGS location. In addition, the differences in the distances and types of roads for transport of hazardous materials would be minor.
- **Land Use and Agriculture.** The Sandy Lane site is zoned Light Industrial. The site does not appear to fall within Master Planned District, P-1RA (Redevelopment Agency Planned Development), as indicated in the AFC. Land use impacts would be greater than the proposed site, which is zoned for Heavy Industrial uses.
- **Noise.** A project located at the Sandy Lane alternative location would be about 120 feet from the nearest residence, compared to 800 feet for the OGS site. Furthermore, the Sandy Lane site is adjacent to residential and agricultural uses, whereas the proposed site is surrounded by industrial and undeveloped parcels. Noise impacts would thus be greater.
- **Paleontology.** Paleontological resources are not likely to be impacted at either the Sandy Lane or proposed OGS site.
- **Public Health.** Although use of the latest technology would make the project unlikely to cause significant long-term public health impacts, the site is closer to residences and schools, for slightly greater overall impacts.
- **Socioeconomics.** The Sandy Lane and OGS sites would draw similar numbers of workers, primarily from Contra Costa and other counties in the Delta region. For either site, most workers would commute, with a few possibly moving temporarily to the local area during construction. Local socioeconomic impacts to the region would be similar.
- **Soils.** The Sandy Lane site is currently farmed, as is the proposed OGS site. With best management practices for soil erosion, impacts to soil resources are expected to be similar.

- **Traffic and Transportation.** The Sandy Lane site can be accessed via the Main Street (Highway 4) offramp from Highway 160. Vehicles would then proceed south on Neroly Road and east on Oakley Road. As these are secondary roads, traffic and transportation impacts would be greater.
- **Visual Resources.** The Sandy Lane site is located in an agricultural pocket, with surrounding agricultural, residential, and commercial uses. A project at the site would be highly visible from all directions, and have greater visual impacts than the proposed OGS site. The two sites would have similar impacts from transmission and other linear infrastructure.
- **Water Resources.** The Sandy Lane site would also use air-cooled condensing, and would require similar water quantities as the proposed project. Water for a project at this site could be provided by tapping into an existing line along Sandy Road. If that is not possible, an approximately 0.9-mile connection would be required to tie into the DuPont water system. When the project shifts to recycled water, a 2.2 mile connection would be required to reach the ISD's treatment plant. Wastewater would be disposed to the ISD. Impacts to water resources would be similar.
- **Waste Management.** Similar quantities of waste would be generated at the Sandy Lane alternative site as with the OGS.
- **Worker Safety.** No differences are expected with respect to worker safety at the Sandy Lane site or proposed OGS site.

Alternatives Table 1 compares the approximate lengths of linear facilities (transmission line, gas pipeline and water lines) required for the proposed and the four alternative sites identified by the applicant. The distances to sensitive receptors and schools are also shown.

Alternatives Table 2 shows how the impacts of the four alternative sites compare to impacts of the OGS site.

ALTERNATIVES Table 1
Comparison of Approximate Length of Linear Facilities/Distance to Receptors

	OGS Site	18th Street Alternative Site	Wilbur Avenue Alternative Site	Riverfront Site	Sandy Lane Site
Transmission Line Length (to Contra Costa Substation)	2.0 miles (entirely in existing corridor)	2.1 miles (partially in existing corridor)	2.4 miles (partially in existing corridor)	3.2 miles (partially in existing corridor)	1.9 miles (partially in existing corridor)
Gas Pipeline Length (to Antioch Terminal)	140 feet	0.6 miles	0.5 miles	1.1 miles	1.0 miles
Potable Water Connections	[Onsite]	<500 feet	<500 feet	<500 feet	<500 feet or 0.9 miles
Recycled Water Connections (to ISD or DDSD wastewater treatment plant)	2.5 to 3.2 miles to ISD	4.7 miles to DDSD	3.7 miles to ISD; 4.4 miles to DDSD	4.3 miles to ISD; 3.9 miles to DDSD	2.2 miles to ISD
Distance to Sensitive Receptors (nearest residence)	800 feet	120 feet	1,200 feet	500 feet	120 feet
Distance to Schools	0.4 miles	0.25 miles	0.48 miles	0.52 miles	0.14 miles

ALTERNATIVES Table 2
Comparison of Impacts of Alternatives to the Proposed OGS *

Issue Area	18th Street Alternative Site	Wilbur Avenue Alternative Site	Riverfront Site	Sandy Lane Site
Environmental Assessment				
Air Quality	Slightly greater than proposed site	Similar to proposed site	Similar to proposed site	Greater than proposed site
Biological Resources	Similar to proposed site	Similar to proposed site	Slightly greater than proposed site	Similar to proposed site
Cultural Resources	Similar to proposed site	Similar to proposed site	Greater than proposed site	Similar to proposed site
Hazardous Materials	Similar to proposed site	Similar to proposed site	Greater than proposed site	Similar to proposed site
Land Use and Agriculture	Greater than proposed site	Similar to proposed site	Similar to proposed site	Greater than proposed site
Noise and Vibration	Slightly greater than proposed site	Similar to proposed site	Similar to proposed site	Greater than proposed site
Public Health	Similar to proposed site	Similar to proposed site	Similar to proposed site	Slightly greater than proposed site
Socioeconomic Resources	Similar to proposed site	Similar to proposed site	Similar to proposed site	Similar to proposed site
Soil and Water Resources	Similar to proposed site	Similar to proposed site	Similar to proposed site	Similar to proposed site
Traffic and Transportation	Slightly greater than proposed site	Similar to proposed site	Similar to proposed site	Greater than proposed site
Visual Resources	Slightly greater than proposed site	Similar to proposed site	Similar to proposed site	Greater than proposed site
Waste Management	Similar to proposed site	Similar to proposed site	Similar to proposed site	Similar to proposed site
Worker Safety	Similar to proposed site	Similar to proposed site	Similar to proposed site	Similar to proposed site
Engineering Assessment				
Geology, Mineral Resources, and Paleontology	Similar to proposed site	Similar to proposed site	Similar to proposed site	Similar to proposed site
Transmission System Engineering	Similar to proposed site	Similar to proposed site	Similar to proposed site	Similar to proposed site

*Shaded cells identify impacts slightly greater and greater than the proposed project

SITE IDENTIFIED BY STAFF FOR FURTHER ANALYSIS

Western Contra Costa County Alternative Site. Due to the concentration of power plants in the Pittsburg/Antioch/Oakley area, staff reviewed industrial parcels in Richmond, Pinole, and Martinez in major transmission corridor areas. However, staff found that the few vacant industrial sites in proximity to transmission lines are generally of insufficient acreage. Freethy Boulevard in Richmond is one such area; combining all of the 0.5-acre to 3-acre contiguous parcels would be significantly less than the 22

acres required for the project. Meanwhile, the larger brownfield sites in the region are primarily in use as oil refineries, and unavailable for siting of the OGS project.

GENERATION TECHNOLOGY ALTERNATIVES

CONSERVATION AND DEMAND SIDE MANAGEMENT

Conservation and demand-side management consist of a variety of approaches to reduction of electricity use, including energy efficiency and conservation, building and appliance standards, and load management and fuel substitution. In 2005 the Energy Commission and the California Public Utilities Commission's (CPUC) Energy Action Plan II declared cost-effective energy efficiency as the resource of first choice for meeting California's energy needs. The Energy Commission noted that energy efficiency helped flatten the state's per capita electricity use and saved consumers more than $56 billion since 1978 (CPUC 2008). The investor-owned utilities' 2006-2008 efficiency portfolio marks the single-largest energy efficiency campaign in U.S. history, with a $2 billion investment by California's energy ratepayers (CPUC 2008). However, with population growth, increasing demand for energy, and the need to reduce greenhouse gases, there is an even greater need for energy efficiency.

The CPUC, with support from the Governor's Office, the Energy Commission, and the California Air Resources Board, among others, adopted the California Long-Term Energy Efficiency Strategy Plan for 2009 to 2020 in September 2008 (CPUC 2008). The plan is a framework for all sectors in California including industry, agriculture, large and small businesses, and households. Major goals of the plan include:

- All new residential construction will be zero net energy by 2020;
- All new commercial construction will be zero net energy by 2030;
- Heating, ventilation, and air conditioning industries will be re-shaped to deliver maximum performance systems;
- Eligible low-income customers will be able to participate in the Low Income Energy Efficiency program and will be provided with cost-effective energy efficiency measures in their residences by 2020.

Conservation and demand-side management are important for California's energy future and cost effective energy efficiency is considered as the resource of first choice for meeting California's energy needs. However, with population growth and increasing demand for energy, conservation and demand-management alone are not sufficient to address all of California's energy needs.

RENEWABLE ENERGY ALTERNATIVES

Staff also considered renewable energy sources. Although viable, these technologies do not have the quick start-up and shut-down capabilities as does the OGS. They would not be able to generate equivalent power at the proposed site and operational constraints at other locations in the region limit their effectiveness as alternatives to the OGS. However, for some technologies (solar, wind, tidal and wave), the concern regarding emissions reductions would be reduced.

- **Solar.** Solar thermal technology – including parabolic trough, power tower, and Stirling engine – converts the sun's energy to heat for utilization by conventional generator equipment. Land requirements can be extensive, and range from 4-5 acres/MW for parabolic trough to 5-10 acres/MW for power tower. Solar thermal plants also require water for steam generation (to power turbines), washing, and cooling. Examples of water requirements include 300 AFY for the Palen Solar Power Project (500 MW parabolic trough with dry-cooling), 32.7 AFY for the Imperial Valley Solar Project (750 MW Stirling engine), and 150 AFY for the Rice Solar Energy Project (150 MW power tower). Although large-scale solar plants are proposed in remote regions, Eastern Contra Costa County has insufficient solar insolation (below 6.0 kWh/m^2/day) for utility-scale solar thermal generation (NREL 2007).

  With photovoltaic (PV) technology, semiconductors directly convert sunlight to electricity. Unlike solar thermal, PV does not require water for electricity generation, although some water (2-10 AFY/100 MW) is required to clean panels. Utility-scale PV requires level land on the order of approximately 10 acres/MW of capacity (CEC 2007). Rooftop photovoltaic is an option to minimize land requirements. For example, in Southern California, Southern California Edison has plans to install 250 MW of solar panels on 2 square miles of commercial rooftop (in 150 installations) over a 5-year period (SCE 2008). NCI (2007) calculated Contra Costa County's economic potential for retrofitting[1] commercial and residential buildings using state subsidies and new business models[2] favoring PV development.

  The report identified a total of 6 MW potential by 2010 and 43 MW potential by 2016. These values are in contrast to 61 MW in 2010 and 253 MW in 2016 identified for Los Angeles. Rooftop PV development in the near future in Contra Costa County, even with economic incentives, would be significantly less than the 624 MW generation capacity of the proposed project.

- **Wind.** Wind carries kinetic energy that can be used to spin the blades of a wind turbine rotor and an electrical generator, which then feed alternating current (AC) into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40% of the wind's kinetic energy into electricity. A single 1.5-MW turbine operating at a 40% capacity factor generates 2,100 MWh annually. Wind turbines currently being

[1] Economic potential of new construction was essentially zero.

[2] For this analysis, NCI used three of the seven business models developed with the Energy Commission's Public Interest Energy Research Program: PV as an Appliance (where PV systems can be sold to a homeowner and incorporated into the home like an appliance as "plug and play"), No Hassle PV (where a single entity bundles the system design, purchase, permitting, rebate application, installation, maintenance, and financing into one transaction for the customer), and PV Consumer Finance (in which initial PV system costs are financed using standard consumer finance models).

manufactured have power ratings ranging from 250 watts to 5 MW, and units larger than 7 MW in capacity are now under development (AWEA 2008). The average capacity of wind turbines installed in the United States in 2007 was 1.65 MW (EERE 2008).

The perception of wind as an emerging energy source reached a peak in the early 1980s, when wind turbine generators to convert wind power into electricity were being installed in California at a rate of nearly 2,000 per year. Progress slowed a few years later, however, as start-up tax subsidies disappeared and experience demonstrated some deficiencies in design. At the present time, technological progress has caught up, contributing to lower cost and greater reliability. Wind technology is well developed and can be used to generate substantial amounts of power. There is now approximately 3,141 MW of wind-generated power being produced in California (CalWEA 2010). Modern wind turbines represent a viable renewable energy technology, as exemplified by the number of wind projects applications pending at the BLM in California. The BLM has received approximately 55 applications for wind projects in the California Desert District as of July 2010, for use of more than 665,049 acres of land (BLM 2010). The Oakley area, however, is not located within Contra Costa County's Wind Energy Resource Area. The county restricts commercial wind farms to the south Byron Hills portion of the county (Contra Costa 2005).

- **Geothermal.** Steam or high-temperature water from geothermal reservoirs is harnessed to drive steam turbine/generators. Geothermal plants range in size from under 1 MW to 110 MW, and require 0.2 to 0.5 acre/MW. Geothermal plants provide highly reliable base-load power, with capacity factors from 90 to 98%. Plants, however, must be built near geothermal reservoir sites, as steam and hot water cannot be transported long distances without significant thermal energy loss. Geothermal plants are currently operating in the California counties of Lake, Sonoma, Imperial, Inyo, Mono, and Lassen. Larger geothermal areas in the Mojave Desert are in Coso Hot Springs (southwestern Inyo County) and Imperial County. There are no known geothermal resources in Contra Costa County (CEC 2005).

- **Biomass.** Electricity is generated by burning organic fuels in a boiler to produce steam, which then turns a turbine. Biomass can also be converted into a fuel gas such as methane and burned. Major biomass fuels include forestry and mill wastes, agricultural field crop and food processing wastes, and construction and urban wood wastes. Biomass facilities do not require an extensive amount of land, but only produce small amounts of electricity (in the range of 3 to 10 MW). Furthermore, there is no large fuel source in the area of the proposed project, and ongoing truck deliveries would be required to supply the plant with the biomass fuel.

  The emissions due to biomass fuel-fired power plant operation are generally unavoidable. Direct impacts of criteria pollutants could cause or contribute to a violation of the ambient air quality standards. Significant impacts can potentially occur for PM10 and ozone because emissions of particulate matter and precursors and ozone precursors could contribute to existing violations of the standards for those criteria pollutants. Biomass/biogas facility emissions could also adversely affect visibility and vegetation in federal Class I areas or state wilderness areas as a result of significantly deteriorating air quality related values in the wilderness areas.

Toxic air contaminants from routine operation would also cause health risks that could adversely affect sensitive receptors in the local area of the plant.

- **Tidal and Wave.** Tidal generation of electricity involves building a dam, known as a barrage, across a bay or estuary. Water retained behind a dam at high tide produces a power head sufficient to generate electricity as the tide ebbs and water released from within the dam turns conventional turbines. A dam across the San Joaquin River would be damaging to fish populations and have other significant environmental impacts. Meanwhile, wave energy technologies -- which include terminator devices, point absorbers, attenuators, and overtopping devices – extract energy from surface wave motion or subsurface pressure fluctuations (MMS 2007). Wave energy is applicable to portions of the California coast, but is not suited for the Suisun Bay/San Joaquin River area under consideration.

ALTERNATIVE LINEAR ROUTES AND WATER SUPPLY OPTIONS

The OGS would interconnect to PG&E's Contra Costa Substation via an existing 2.4-mile transmission corridor, extending south from the OGS (on the east side of Highway 160) and then due west (along the north side of Oakley Road). The existing 60-kV transmission steel lattice towers in the corridor would be replaced by new monopole towers carrying a 230-kV transmission line from the OGS to the substation. The 60-kV line would be either co-located on the monopole structures or replaced by the 230-kV line. The applicant identified an alternative 2.3-mile transmission route along East 18th Street/Main Street that follows an existing transmission corridor for the last 1,300 feet. However, the alternative route would have greater impacts (to traffic and residences/businesses along heavily developed East 18th Street) and would have no advantages over the proposed route. As the proposed route follows an existing corridor for the entire route, staff did not consider any additional alternatives.

Natural gas would be obtained from PG&E Line 303 (located in the southeastern portion of the Antioch Terminal) via an approximately 140-foot-long, 6- to 10-inch-diameter connection to the gas metering station. The project owner may also choose to include a similar secondary natural gas supply connection from Line 400 (in the northeastern portion of the Antioch Terminal). Due to the short distance to the adjacent Antioch Terminal, neither the applicant nor staff analyzed any alternatives to the natural gas pipeline route.

The OGS would require about 240 AFY for plant cooling and process water, fire protection, and potable uses. The Diablo Water District would supply potable water for these purposes via an existing 24-inch diameter distribution pipeline that runs north-south through the OGS site (just east of PG&E's Antioch Terminal). This use of potable water has the potential for significant adverse impacts. However, the OGS has committed to using recycled water when it becomes available from the ISD's wastewater treatment plant located at 450 Walnut Meadows Drive in Oakley. Construction on the plant started on April 22, 2009, with anticipated completion in October 2011 (ISD 2010). With measures in the Soil & Water Resources section of this PSA requiring the transition to recycled water, staff did not consider any alternative water supplies.

The OGS would annually discharge approximately 43 million gallons of wastewater to an existing ISD sewer line located in Main Street via the construction of a new force main in Bridgehead Road, which borders the west side of the site. Alternative wastewater routes were not evaluated due to the short length and direct connection.

THE “NO PROJECT” ALTERNATIVE

The “no project” alternative under CEQA assumes that the project is not constructed. In the CEQA analysis, the “no project” alternative is compared to the proposed project and determined to be superior, equivalent, or inferior to it. The CEQA Guidelines state that “the purpose of describing and analyzing a no project alternative is to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.” (Cal. Code Regs., tit. 14, § 15126.6, subd. (1).) Toward that end, the “no project” analysis considers “existing conditions” and “what would be reasonably expected to occur in the foreseeable future if the project were not approved.” (§ 15126.6, subd. (e)(2).) CEQA Guidelines and Energy Commission regulations require consideration of the “no project” alternative. The no project alternative is compared to the effects of constructing the proposed project. In short, the impacts associated with the new power plant would not occur at this site if the project does not go forward.

Selection of the “no project” alternative would render all concerns about project impact moot. The “no project” alternative would preclude any construction or operation and, thus, installation of new foundations, piping, or utility connections.

If the project were not built, the region would not benefit from the local and efficient source of 624 MW of new generation that this facility would provide nor would jobs be created in support of project construction and operation. As noted above, the OGS project would also increase reliability and compensate for the intermittency of renewable energy sources.

In the absence of the OGS project, however, other power plants could likely be constructed in the project area or in California to serve the demand that could have been met with the OGS project. New plants constructed in the area could utilize undeveloped land (greenfield sites), possibly creating significant environmental impacts. If no new natural gas plants were constructed, reliance on older power plants may increase. These plants could consume more fuel and emit more air pollutants per kilowatt-hour generated than the proposed project. In the near term, the more likely result is that existing plants, many of which produce higher levels of pollutants, could operate more than they do now. Thus, the “no project” alternative is not environmentally superior to the OGS project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Comment	Response
Public (Galey, J. 2010): Rather than purchase new land for the OGS, use the old Contra Costa Power Plant site units 1-3.	CCPP units 1-3 were built in 1951 and have been retired. Removal of these units and replacement with new units would entail significant additional cost. The Marsh Landing Generating Station has already been approved for construction on a portion of the Contra Costa Power Plant site. It is unlikely that the OGS applicant could acquire land at this location. Furthermore, the area occupied by the retired units would be less than a third of the size required by the proposed 22-acre OGS.

CONCLUSIONS AND RECOMMENDATION

As determined by Energy Commission staff in the PSA, with the exception of air quality and biological resources, impacts associated with the OGS could be mitigated to less than significant. The OGS applicant has not identified the specific emissions reductions it would use to mitigate the proposed project's air quality impacts and has not demonstrated control of sufficient emissions reductions. Staff is awaiting information from the applicant regarding removal of trees and feedback anticipated from the East Contra Costa County Habitat Conservancy on the applicant's submittal of a PSR relating to a federal take permit. Therefore, staff cannot determine at this time whether air emissions would create a significant impact.

Located in a heavy industrial area adjacent to the Antioch gas terminal, the proposed site is suitable for the project. The alternative sites in the vicinity have disadvantages (e.g. longer gas and transmission interconnections, greater visual presence, closer to receptors) and no significant advantages over the proposed site. All alternative sites would share the same concern regarding emissions reductions.

Staff does not believe that alternative technologies such as solar, wind, geothermal, biomass, tidal, and wave present feasible alternatives to the proposed project. The alternative linear routes are feasible but present no clear advantage. At this time, staff does not recommend an alternative over the project as proposed.

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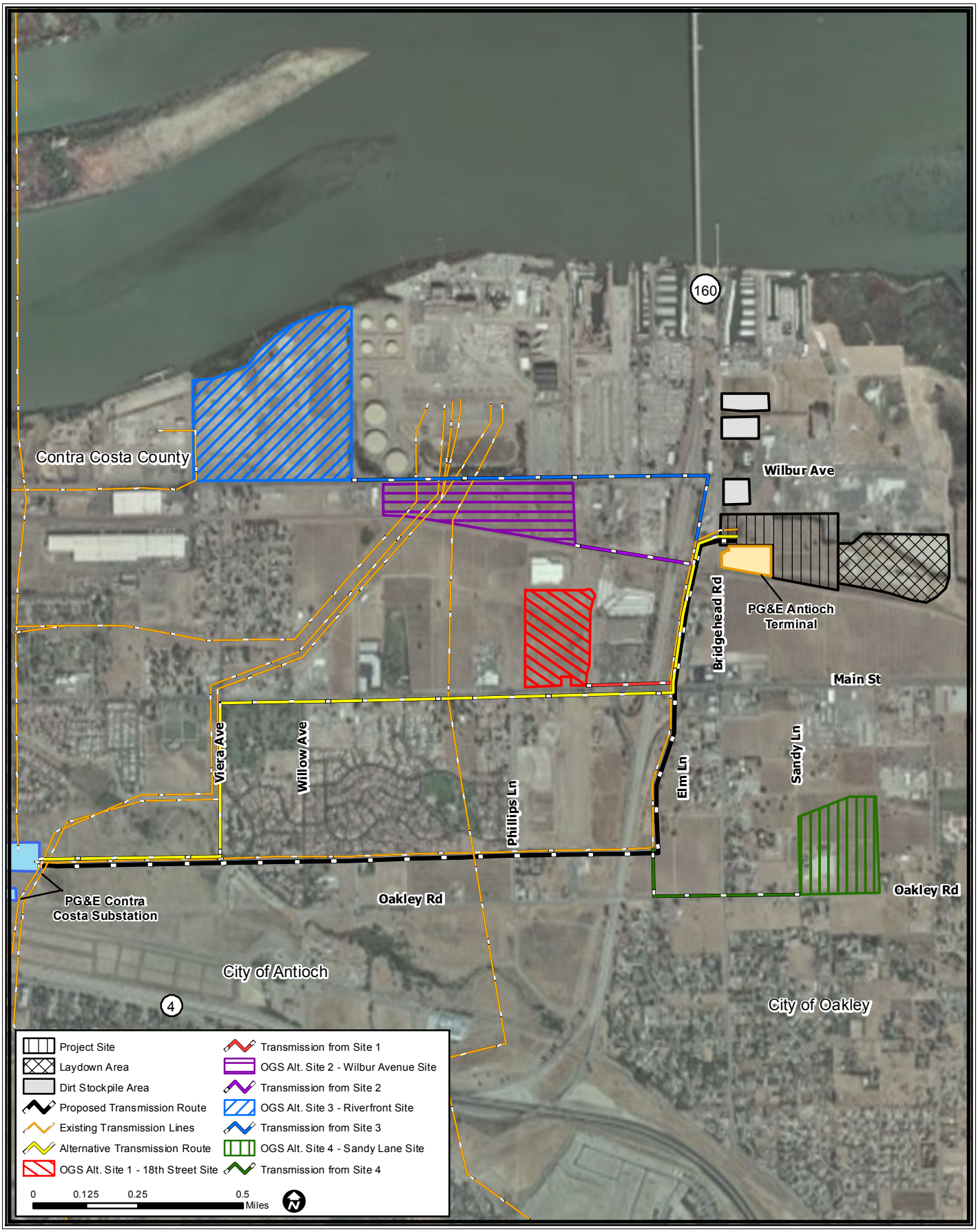
ALTERNATIVES - FIGURE 1

Oakley Generation Station - Alternative Sites



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, JANUARY 2011

SOURCE: California Energy Commission and OG 2009a

APPENDIX A

City of Oakley April 5, 2010 Letter – Recommended Conditions of Approval

City of Oakley Recommended Conditions of Approval General	Responsible Section for Compliance	Staff Response
1. All construction drawings submitted for plan check shall be in substantial compliance with the plans presented to and approved by the California Energy Commission on _____.	**Facility Design**	Addressed in PSA Part A
2. All conditions of approval shall be satisfied by the owner/developer. All costs associated with compliance with the conditions shall be at the owner/developer's expense.	**All Sections requiring Conditions of Certification**	Addressed in all Conditions of Certification through the verification process. Chief Building Official (CBO) cost addressed in Condition of Certification **GEN-3** and a Memorandum of Understanding (MOU) between the CBO and project owner.
3. Noise generating construction activities such as power generators, shall be limited to the hours of 6:30 a.m. to 6:30 p.m. Monday through Friday, and shall be prohibited on City, State, and Federal Holidays. The restrictions on allowed working days and times may be modified on prior written approval by the Community Development Director. City to defer to conditions imposed by CEC regarding neighborhood notification prior to construction and telephone number for public to report noise complaints.	**Noise and Vibration**	Addressed in PSA Part A
4. City to defer to conditions imposed by CEC regarding archaeological resources.	**Cultural Resources**	Addressed in PSA Part A
5. All mitigation measures addressed in the environmental document shall be complied with and addressed as outlined in the Mitigation Monitoring Program approved for this project.	**All sections requiring Conditions of Certification / Legal / General Conditions**	All sections that recommend Conditions of Certification contain a "Verification" component that ensures ongoing compliance to the extent necessary.
6. The applicant shall indemnify, defend, and hold harmless the City of Oakley, the City Approving Authorities, and the officers, agents and employees of the City from any and all claims, damages and liability (including, but not limited to, damages,	**Legal**	Not applicable.

attorney fees, expenses of litigation, costs of court) relating to the Oakley Generating Station.		
Site Plan/Architecture	**Responsible Section for Compliance**	**Staff Response**
7. The project owner shall submit for the Community Development Director's review and approval a site plan with dimensions showing the locations of the proposed buildings and structures in compliance with the minimum setbacks from the property line as set forth in the Oakley Zoning Code.	**Land Use**	The Energy Commission has exclusive authority for siting power plants over 50 MWs. Condition of Certification **LAND-1** has been recommended to ensure that the proposed OGS complies with applicable portions of the city's Zoning Code. Also, note that the applicant and the city have executed the Oakley Generating Station Cooperation and Community Benefits Agreement (dated March 31, 2010), wherein several of the city's requirements have been agreed upon.
8. The project shall comply with the parking standards established by the Oakley Zoning Code. All parking stall striping shall be double striped. Parking stalls shall be 9 feet wide by 19 feet deep and drive aisles shall be a minimum 24 feet in width as reviewed and approved by the Community Development Director.	**Facility Design**	Addressed in PSA Part A
9. A lighting and photometric plan shall be submitted to the Community Development Director for review and approval prior to the issuance of building permits. City to defer to conditions imposed by CECs regarding minimizing backscatter to the nighttime sky, shielding to prevent light trespass, and motion detectors to light areas only when occupied, unless CEC does not impose and such conditions, in which event measures to minimize backscatter and shield light trespass shall be incorporated into the lighting and photometric plan for review and approval by the City.	**Visual**	Addressed in PSA Part A
10. Trash enclosures shall match Oakley Disposal and City standards and shall provide adequate space to accommodate both trash and recycling, as determined by the Community Development Director. Trash enclosures shall be constructed with a roof to match the building materials and have metal gates.	**Waste Management**	Addressed in PSA Part A
11. Storage shall be contained inside the buildings. Pallets, boxes, cardboard, etc. shall not be stored outside, except within trash	**Waste Management**	Addressed in PSA Part A

enclosures.		
Landscaping Requirements	**Responsible Section for Compliance**	**Staff Response**
12. A landscaping and irrigation plan for all areas shown on the site plan shall be submitted for review and approval of the Community Development Director prior to the issuance of building permits. The landscaping plan shall include the project's frontage, side and rear yards. Landscaping shall conform to the City's Water Efficient Landscaping Ordinance and shall be installed prior to Certificate of Occupancy. The plans shall by prepared by licensed landscape architect and shall be certified to be in compliance with the City's Water Efficient Landscape Ordinance.	**Visual**	Addressed in PSA Part A
13. California native drought tolerant plants shall be used to the extent feasible, and subject to the approval of the Community Development Director.	**Visual**	Addressed in PSA Part A
14. Prior to start of commercial operation, the applicant shall implement a Screening Trees Plan reviewed and approved by the City of Oakley. If site constraints prevent effective screening of the power plant facility on the subject site, the applicant shall identify and implement screening in offsite locations, as required and approved by the Community Development Director.	**Visual**	Addressed in PSA Part A
15. Prior to issuance of a certificate of occupancy, an on-site inspection shall be made of the entire project site by a licensed landscape architect to determine compliance with the approved landscape plan. A signed certification of completion shall be submitted to the Community Development Director for review and approval.	**Visual**	Addressed in PSA Part A
16. Landscaping shall be maintained as shown on the landscape plan in perpetuity.	**Visual**	Addressed in PSA Part A

Sound Walls	Responsible Section for Compliance	Staff Response
17. If sound walls are required to comply with applicable City and local standards, sound walls shall attenuate, not just deflect sound. Sound absorbing material should be used for the construction of sound walls, per the review and approval of the Community Development Director. Anti-graffiti shall be used on sound walls.	**Noise and Vibration**	Addressed in PSA Part A
Signage	**Responsible Section for Compliance**	**Staff Response**
18. All signage shall meet the requirements of the City of Oakley's Sign Ordinance in the Zoning Code. All proposed signage shall be reviewed and approved by the Planning and Building Divisions.	**Land Use**	The Energy Commission has exclusive authority for siting power plants over 50 MWs. Condition of Certification **LAND-1** has been recommended to ensure that the proposed OGS complies with applicable portions of the city's Zoning Code. Also, note that the applicant and the city have executed the Oakley Generating Station Cooperation and Community Benefits Agreement (dated March 31, 2010), wherein several of the city's requirements have been agreed upon.
19. All signs shall be on permanent structures and of design and material to compliment the proposed commercial building. No signs on the premises shall be animated, rotating or flashing. No flags, pennants, banners, pinwheels or similar items shall be permitted on the premises, with the exception of a United States flag, California state flag, and required safety devices, such as windsocks.	**Land Use**	This is not applicable to the proposed project. In addition, this project is not a proposed commercial building.
20. Temporary signage, for such things as special events and grand openings, shall require a Temporary Use Permit per the review and approval of the Community Development Director.	**Land Use**	This is not applicable to the proposed project. In addition, this project is not a proposed commercial building.
Lay Down/Staging Area	**Responsible Section for Compliance**	**Staff Response**
21. The project owner shall provide the Oakley Community Development Department for review and approval the description of the final lay down/staging areas identified for construction of the project. The description shall include: Assessor's Parcel numbers,	**Land Use**	The AFC includes this information. Also, the applicant and the city have executed the Oakley Generating Station Cooperation and Community Benefits Agreement (dated March 31, 2010), wherein several of the city's requirements have been agreed

addresses, land use designations, zoning, site plan showing dimensions, owner's name and addressed (if leased).		upon.
Construction Traffic	**Responsible Section for Compliance**	**Staff Response**
22. Following completion of project construction of the power plant and all related facilities, the project owner shall repair (insert affected roadways) that were affected by the installation of linear facilities, to at least their pre-construction condition. 1) The project owner shall photograph, videotape or digitally record images of portions of (insert affected roadways) in the area of the underground linear facility installations. 2) The project owner shall also notify the City of Oakley, Contra Costa County, and Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction related activities associated with other projects.	**Traffic & Transportation**	Condition of Certification **TRANS-3** requires that any road damaged by project construction be repaired to its original condition and coordinated with the appropriate jurisdiction.
23. Following construction of the power plant and all related facilities, the project owner shall meet with the CPM and City of Oakley to determine the actions necessary and schedule to complete the repair of all roadways to original or as near original condition as possible.	**Traffic & Transportation**	As verification of Condition of Certification **TRANS-3,** the project owner shall meet with the CPM and city of Oakley within 30 days after completion of the project to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near-original condition as possible.
Marking and/or Lighting of Stacks	**Responsible Section for Compliance**	**Staff Response**
24. The project owner shall provide appropriate evidence of compliance with Federal Aviation Administration (FAA) regulations to the Oakley Community Development Department regarding the marking and/or lighting of the project's exhaust stacks.	**Traffic & Transportation**	As all permanent project components are under 200-feet in height and do not exceed any obstruction standard of FAA Form 7460, no proposed project components are subject to FAA lighting or marking requirements. During construction, it is possible that cranes exceeding 200-feet in height could be utilized. In the event this occurs, staff is proposing Condition of Certification **TRANS-2**, which would require all construction equipment exceeding 200-feet in height adhere to FAA Advisory Circular 70/7460-1K Obstruction Marking and Lighting

		requirements."
Air Quality	**Responsible Section for Compliance**	**Staff Response**
25. City to defer to conditions by CEC and BAAQMD for air quality.	**Air Quality**	See Conditions of Certification **AQ-SC1** through **AQ-50**.
Biological Resources	**Responsible Section for Compliance**	**Staff Response**
26. The project owner shall protect, preserve, and improve the 0.62-acre wetlands located on the Project Site by removing garbage and replacing non native species with native species.	**Biological Resources**	See Condition of Certification **BIO-8**.
27. The project shall be subject to compliance with East Contra Costa County Habitat Conservation Plan (HCP/NCCP).	**Biological Resources**	See Conditions of Certification **BIO-9, BIO-11, BIO-12, BIO-14, BIO-16, BIO-17, BIO-20,** and **BIO-21**.
28. City to defer to Conditions imposed by CEC regarding other biological resources.	**Biological Resources**	See Conditions of Certification **BIO-1** through **BIO-8, BIO-10, BIO-13, BIO-15,** and **BIO-19**.
Facility Closure	**Responsible Section for Compliance**	**Staff Response**
29. City to defer to conditions imposed by the CEC regarding facility closure, subject to the City's review and approval of the facility closure plan prepared by the project applicant.	**Facility Design**	Addressed in PSA Part A
Building Division Conditions	**Responsible Section for Compliance**	**Staff Response**
30. The Chief Building Official (CBO) shall be the City of Oakley Building Official as referenced in these conditions.	**Facility Design**	Addressed in PSA Part A
31. Plans shall meet the currently adopted Uniform Codes as well as the newest T-24 Energy Requirements per the State of California Energy Commission. To confirm the most recent adopted codes please contact the Building Division at (925) 625-7005.	**Facility Design**	Addressed in PSA Part A
32. City to defer to Conditions imposed by CEC regarding	**Worker Safety and Fire**	Addressed in PSA Part A

Automatic Life Safety Sprinkler System.	**Protection**	
33. City to defer to Conditions imposed by CEC for detailed specifications regarding plan check and permit process for construction of power plant.	**Facility Design**	Addressed in PSA Part A
34. Prior to requesting a Certificate of Occupancy from the Building Division all Conditions of Approval required to be completed prior to occupancy must be completed.	**Facility Design**	Addressed in PSA Part A
Public Works and Engineering Conditions	**Responsible Section for Compliance**	**Staff Response**
35. Submit improvement plans prepared by a registered civil engineer to the City Engineer for review and approval and pay the appropriate processing costs in accordance with the Municipal Code and these conditions of approval. The plans shall be consistent with the Stormwater Control Plan for the project, include the drawings and specifications necessary to implement the required stormwater control measures, and be accompanied by a Construction Plan C.3 Checklist as described in the Stormwater C.3 Guidebook.	**Facility Design**	Addressed in PSA Part A
36. Submit grading plans including erosion control measures and revegetation plans prepared by a registered civil engineer to the City Engineer for review and approval and pay appropriate review and processing costs in accordance with the Code and these conditions of approval.	**Facility Design**	Addressed in PSA Part A
37. Submit landscaping plans for publicly maintained landscaping, including planting and irrigation details, as prepared by a licensed landscape architect to the City Engineer for review and approval and pay appropriate review and processing costs in accordance with the Code and these conditions of approval.	**Visual**	Addressed in PSA Part A
38. Execute any agreements required by the Stormwater Control Plan which pertain to the transfer of ownership and/or long term maintenance of stormwater treatment mechanisms required by the plan.	**Soil and Water**	Not required as Project Owner maintains responsibility for Stormwater Treatment BMPs.

Roadway Improvements	Responsible Section for Compliance	Staff Response
39. Construct the frontage of Bridgehead Road to City public road standards for a four lane divided arterial, including curb, sidewalk, right of way landscaping, a sixteen foot wide landscaped median, necessary longitudinal and transverse drainage, pavement widening and conformance to existing improvements.	**Traffic and Transportation**	The Traffic and Transportation section identifies this condition and replies as follows: Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
40. Design all public pedestrian facilities in accordance with Title 24 (Handicap Access) and the Americans with Disabilities Act.	**Traffic and Transportation**	The Traffic and Transportation section identifies this condition and replies as follows: Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.

Road Alignment/Sight Distance	Responsible Section for Compliance	Staff Response
41. Submit a preliminary plan and profile to the City Engineer for review and approval showing all required improvements to Bridgehead Road, and pay appropriate review and processing costs. The sketch plan shall be to scale, show horizontal and vertical alignments, transitions, curb lines, lane striping and cross sections and shall provide sight distance for a design speed of 55 miles per hour. The plan shall extend a minimum of 150 feet ± beyond the limits of the proposed work.	**Traffic and Transportation**	The Traffic and Transportation section identifies this condition and replies as follows: Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
42. Locate any project signs so as to not obstruct sight distance at the intersection of Bridgehead Road and the project driveways. The design speed for Bridgehead Road shall be 55 mph.	**Traffic and Transportation**	The Traffic and Transportation section identifies this condition and replies as follows: Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
Road Dedications	**Responsible Section for Compliance**	**Staff Response**
43. Convey to the City, by offer of dedication, the right of way for Bridgehead Road along the project frontage.	**Traffic and Transportation**	The Traffic and Transportation section identifies this condition and replies as follows: Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
44. Relinquish abutter's rights of access along Bridgehead Road except for the one approved driveway location.	**Traffic and Transportation**	The Traffic and Transportation section identifies this condition and replies as follows: Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.

Access to Adjoining Property	Responsible Section for Compliance	Staff Response
45. Furnish necessary rights of way, rights of entry, permits and/or easements for the construction of off-site, temporary or permanent, public or private road and drainage improvements.	**Traffic and Transportation**	The Traffic and Transportation section identifies this condition and replies as follows: Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
46. Obtain an encroachment permit from Caltrans for construction of any improvements within the State right of way.	**Traffic and Transportation**	Condition of Certification **TRANS-4** requires that encroachment on public ROW during construction comply with Caltrans, Contra Costa County, city of Oakley, and other relevant jurisdictions limitations and requires all permits be obtained for such activities.
47. Applicant shall only be allowed access to the project site at the one location shown on the approved site plan.	**Traffic and Transportation**	The Traffic and Transportation section identifies this condition and replies as follows: Condition of Certification **LAND-1** ensures that the project and its associated facilities are constructed and operated in compliance with the provisions of the city of Oakley's requirements as detailed in Article 16, 9.1.1602 Variance and Conditional Use Permit, from the city's Municipal Code.
Landscaping in the Public Right of Way	**Responsible Section for Compliance**	**Staff Response**
48. Enter into an agreement with the City that requires the right of way landscaping adjacent to the site to be maintained as part of the on-site landscaping at the property owner's expense to a standard acceptable to and agreed upon by the City.	**Visual Resources**	Addressed in PSA Part A
Street Lights	**Responsible Section for Compliance**	**Staff Response**
49. Install streetlights along the project Bridgehead Road frontage. The City Engineer shall determine the final number and location of the lights, and the lights shall be on an LS2-A rate service. The	**Visual Resources**	Addressed in PSA Part A

lights shall be General Electric spun aluminum “cobra head” style.		
Grading	**Responsible Section for Compliance**	**Staff Response**
50. Submit geotechnical report to the City Engineer for review and approval that substantiates the design features incorporated into the project, including but not limited to grading activities, compaction requirements, utility construction, slopes, retaining walls, and roadway and pavement sections, and pay all appropriate review and processing costs.	**Facility Design**	Addressed in PSA Part A
51. At least one week prior to commencement of grading, the applicant shall post on the site and mail to the owners of property within 300 feet of the exterior boundary of the project site notice that construction work will commence. The notice shall include a list of contact persons with name, title, phone number and area of responsibility. The person responsible for maintaining the list shall be included. The list shall be kept current at all times and shall consist of persons with authority to indicate and implement corrective action in their area of responsibility. The names of the individual responsible for noise and litter control shall be expressly identified in the notice. The notice shall be reissued with each phase of major grading activity. A copy of the notice shall be concurrently transmitted to the City Engineer. The notice shall be accompanied by a list of the names and addresses of the property owners noticed, and a map identifying the area noticed.	**Noise and Vibration**	Addressed in PSA Part A
52. A list of all dust control measures to be implemented by the project shall be provided for the review and approval of the City Engineer, which measures shall supplement all measures imposed by the CEC.	**Air Quality**	See Conditions of Certification **AQ-SC1** through **AQ-SC4** for construction dust control. Following construction, the operational site would be paved and/or graveled and would not be a substantial source of dust.
53. Grade any slopes with a vertical height of four feet or more at a slope of 3 to 1. Retaining walls that may be installed to reduce the slope must be masonry and comply with the City’s building code.	**Facility Design**	Addressed in PSA Part A
54. Submit a dust and litter control plan to the City Engineer for review and approval, and pay all appropriate review and	**Air Quality**	See Condition of Certification **AQ-SC2**. The Oakley City Engineer would have the opportunity to review and comment

processing costs, prior to beginning any construction activities. The City-approved plan shall supplement all dust and litter control conditions imposed by the CEC.		on the Air Quality Construction Mitigation Plan at least 60 days prior to ground disturbance, and the City of Oakley may request revisions and appropriate fees at that time.
55. Submit a haul route plan to the City Engineer for review and approval prior to importing or exporting any material from the site, and pay all appropriate review and processing costs. The plan shall include the location of the borrow or fill area, the proposed haul routes, the estimated number and frequency of trips, and the proposed schedule of hauling. Based on this plan the City Engineer shall determine whether pavement condition surveys must be conducted along the proposed haul routes to determine what impacts the trucking activities may have. The project proponents shall be responsible to repair to their pre-construction condition any roads along the utilized routes.	**Traffic and Transportation**	Condition of Certification **TRANS-1** requires that a Construction Traffic Control Plan be prepared in coordination with city of Oakley and include construction vehicle haul routes, location of the borrow/fill area, estimated number and frequency of construction vehicle trips, and proposed schedule of hauling. Furthermore, Condition of Certification **TRANS-3** requires that any road damaged by project construction be repaired to its original condition and coordinated with the appropriate jurisdiction.
56. Prior to commencement of any site work that will result in a land disturbance of one acre or more, the applicant shall provide evidence to the City Engineer that the requirements for obtaining a State General Construction Permit have been met. Such evidence may be a copy of the Notice of Intent letter sent by the State Water Resources Control Board. The WDID Number shall be shown on the grading plan prior to approval by the City Engineer.	**Soil and Water**	A Notice of Intent is required under Condition of Certification **Soil & Water-3**, and construction SWPPP is required under Condition of Certification **Soil & Water-2**.
57. Submit an updated erosion control plan reflecting current site conditions to the City Engineer for review and approval no later than September 1st of every year while the Notice of Intent is active, and pay all appropriate review and processing costs.	**Soil and Water**	Drainage Erosion and Sediment Control Plan are required under Condition of Certification **Soil & Water-1**, and construction SWPPP is required under Condition of Certification **Soil & Water-2**.
58. Grade all pad elevations or install levees to satisfy Chapter 914-10 of the City's Municipal Code, including degree of protection provisions.	**Facility Design**	Addressed in PSA Part A
59. The burying of any construction debris is prohibited on construction sites.	**Waste Management**	Addressed in PSA Part A

Utilities/Undergrounding	Responsible Section for Compliance	Staff Response
60. Underground all new and existing utility distribution facilities along the frontage of Bridgehead Road. The applicant shall provide joint trench composite plans for the underground electrical, gas, telephone, cable television and communication conduits and cables including size, location and details of all trenches, locations of building utility service stubs and meters and placements or arrangements of junction structures as part of the Improvement Plan submittals for the project. The composite drawings and/or utility improvement plans shall be signed by a licensed civil engineer.	**Facility Design**	Addressed in PSA Part A
61. All utility boxes with the public right of way shall be installed underground and all wires and cables must be installed in conduits. The determination of compliance with this condition shall be at the discretion of the City Engineer.	**Facility Design**	Addressed in PSA Part A
62. Above ground utility boxes with the public right of way shall be screened per the review and approval of the City Engineer.	**Facility Design**	Addressed in PSA Part A
Drainage Improvements	**Responsible Section for Compliance**	**Staff Response**
63. Collect and convey all stormwater entering and/or originating on this property, without diversion and within an adequate storm drainage facility, to an adequate natural watercourse having definable bed and banks, or to an existing adequate public storm drainage facility that conveys the storm waters to an adequate water course. Alternatively, develop on-site retention and infiltration system of adequate size and capacity to accommodate the 100-year frequency event plus appropriate factors of safety to ensure that stormwater is kept on-site. The applicant shall submit plans and supporting calculations and documentation for the infiltration basin to the City Engineer for review and approval, and shall pay all appropriate review and processing costs.	**Soil and Water**	Stormwater conveyance and water quality treatment BMPs including Retention/Infiltration Basin is covered under Drainage, Erosion and Sediment Control required in Condition of Certification **Soil & Water-1**.

64. Submit a final hydraulic report including 10-year and 100-year frequency event calculations for the proposed drainage system and stromwater pond to the City Engineer for review and approval, and pay all appropriate review and processing costs.	**Soil and Water**	Hydrology and Hydraulic report, including 10-year and 100-year storm analyses covered under Drainage, Erosion and Sediment Control required in Condition of Certification **Soil & Water-1**.
65. Design and construct all storm drainage facilities in compliance with the Municipal Code and City design standards.	**Soil and Water**	City review and comment of storm drainage designs under Drainage, Erosion and Sediment Control required in Condition of Certification **Soil & Water-1**.
66. Prevent storm drainage from draining across the sidewalk(s) and driveway(s) in a concentrated manner.	**Soil and Water**	City review and comment of storm drainage designs under Drainage, Erosion and Sediment Control required in Condition of Certification **Soil & Water-1**.
67. Dedicate a public drainage easement over the drainage system that conveys storm water run-off from public streets.	**Soil and Water**	Stormwater runoff from public streets not affected by the proposed project. Runoff from public streets will not be discharged onto project site.
National Pollutant Discharge Elimination System (NPDES)	**Responsible Section for Compliance**	**Staff Response**
68. Comply with all rules, regulations and procedures of the National Pollutant Discharge Elimination System (NPDES) for municipal, construction and industrial activities as promulgated by the California Water Resources Control Board, the Regional Water Quality Control Board (Central Valley – Region IV), including the Stormwater C.3 requirements as detailed in the Guidebook available at www.cccleanwater.org. Compliance shall include developing long-term best management practices (BMP's) for the reduction or elimination of storm water pollutants. The project design shall incorporate wherever feasible, the following long-term BMP's in accordance with the Contra Costa Clean Water Program for the site's storm water drainage: • Utilize pavers or other pervious materials for driveways, walkways, and parking areas wherever feasible. • Minimize amount of directly connected impervious surface area. • Delineate all storm drains with "No Dumping, Drains to the Delta" permanent metal markers per City standards. • Construct concrete driveway weakened plane joints at	**Soil and Water**	Stormwater conveyance and water quality treatment BMPs including bioswales and Retention/Infiltration Basin design to meet C.3 requirements covered under Drainage, Erosion and Sediment Control required in Condition of Certification **Soil & Water-1**.

angles to assist in directing run-off to landscape/pervious areas prior to entering the street curb and gutter. • Install filters in on-site storm drain inlets. • Sweeping the paved portion of the site at least once a month utilizing a vacuum types sweeper. • Use of the landscape areas, vegetated swales, pervious pavement, and other infiltration mechanisms to filter stormwater prior to entering the storm drain system. • Provide a sufficient amount of on-site trash receptacles. • Distribute public information items regarding the Clean Water Program to vendors and suppliers. • Other alternatives as approved by the City Engineer.		
Fees/Assessments	**Responsible Section for Compliance**	**Staff Response**
69. Comply with the requirements of the development impact fees listed below, in addition to those noticed by the City Council in Resolution 00-85 and 08-03. The applicant shall pay the fees in the amounts in effect at the time each building permit is issued.		
A. Traffic Impact Fee (authorized by Ordinance No. 14-00, adopted by Resolution 49-03)	**Traffic and Transportation**	See **TRANS-5**
B. Regional Transportation Development Impact Fee or any future alternative regional fee adopted by the City (authorized by Ordinance No. 14-00, adopted by Resolution No. 73-05)	**Traffic and Transportation**	See **TRANS-5**
C. Park and Land Dedication In-Lieu Fee (adopted by Ordinance No. 03-03)	**Socioeconomic**	See **SOCIO-1**
D. Park Impact Fee (authorized by Ordinance No. 05-00, adopted by Resolution No. 19-03)	**Socioeconomic**	See **SOCIO-1**
E. Public Facilities Fee (authorized by Ordinance No. 05-00, adopted by Resolution No. 18-03)	**Socioeconomic**	See **SOCIO-1**
F. Fire Facilities Impact Fee, collected by the City (adopted by Resolution No. 18-03)	**Socioeconomic**	See **SOCIO-1**
G. General Plan Fee (adopted by Resolution No. 53-03) and	**Land Use**	Item G (General Plan Fee) is not a LORS that is applicable to the proposed project because of the Energy Commission's exclusive authority to license power plants over 50 megawatts. Detailed discussion justifying inapplicability of this LORS is provided in the Land Use section of the PSA Part B.
H. East Contra Costa County Habitat Conservation Plan Fee (adopted by Resolution No. 12-07)	**Biology**	See **BIO-20**
The applicant should contact the City Engineer prior to constructing any public improvements to determine if any of		

the required improvements are eligible for credits or reimbursements against the applicable traffic benefit fees or from future developments.		
70. The applicant shall be responsible for paying County Recorder's fees for the Notice of Determination as well as the State Department of Fish and Game's filing fee.		Addressed in PSA Part A
71. Annex the property to the City of Oakley Landscape and Lighting District No. 1 for citywide landscaping and park maintenance, subject to an assessment for maintenance based on the assessment methodology described in the Engineer's Report. The assessment shall be the per parcel annual amount (with appropriate future cost of living adjustment) as established at the time of voting by the City Council. Any required election and/or ballot protest proceedings shall be completed prior to issuance of a certificate of occupancy. The Applicant shall apply for annexation and provide all information and documents required by the City to process annexation. All costs of annexation shall be paid by Applicant.	**Land Use/Visual**	CEC staff needs to consult with City of Oakley regarding appropriate LORS supporting recommended condition.
72. Same as 71.		
73. Participate in the provision of funding to maintain police services by voting to approve a special tax for the parcels utilized by this project. The tax shall be the per parcel annual amount (with appropriate future cost of living adjustment) as established at the time of voting by the City Council. The election to provide the tax shall be completed prior to issuance of a certificate of occupancy. Should the building be occupied prior to the City receiving the first disbursement from the tax bill, the applicant shall be responsible for paying the pro-rata share for the remainder of the tax year prior to the City conducting a final inspection.		Addressed in PSA Part A
74. Participate in the formation of a mechanism to fund the operation and maintenance of the storm drain system, including storm water quality monitoring and reporting. The appropriate funding mechanism shall be determined by the City and may include, but not be limited to, an assessment district, community	**Soil and Water**	Monitoring and Adaptive Management Plan for Mitigation Wetland E including water quality monitoring and reporting required under Condition of Certification **Soil & Water-6**. Industrial SWPPP required under Certification **Soil & Water-5**.

services district, or community facilities district. The funding mechanism shall be formed prior to issuance of a certificate of occupancy, and the project proponent shall fund all costs of the formation.		

75. Applicant shall comply with the drainage fee requirements as adopted by the County Board of Supervisors. The applicant shall pay the fee in effect at the time of building permit issuance. Certain improvements required by the Conditions of Approval for this development or the Code may be eligible for credit or reimbursement against the drainage area fee. The applicant should contact the City Engineer to determine the extent of any credit or reimbursement for which they might be eligible. Any credit or reimbursement shall be determined prior to building permit issuance or as approved by the Flood Control District.	**Soil and Water**	Monitoring and Adaptive Management Plan for Mitigation Wetland E including water quality monitoring and reporting required under Condition of Certification **Soil & Water-6**. Industrial SWPPP required under Certification **Soil & Water-5**.

PREPARATION TEAM

OAKLEY GENERATING STATION
09-AFC-4
PREPARATION TEAM

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Land Use.....Negar Vahidi and Susanne Huerta
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BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
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1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *OAKLEY GENERATING STATION*

Docket No. 09-AFC-4
PROOF OF SERVICE
(Revised 8/13/2010)

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DECLARATION OF SERVICE

I, Maria Santourdjian, declare that on January 14, 2011, I served and filed copies of the attached Preliminary Staff Assessment Part B. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[http://www.energy.ca.gov/sitingcases/contracosta/index.html].** The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

__x__ sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery;

_____ by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "email preferred."

AND

For filing with the Energy Commission:

__x__ **sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (preferred method);**

OR

_____depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-4
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Originally Signed by
Maria Santourdjian