CALIFORNIA ENERGY COMMISSION
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SACRAMENTO, CA 95814-5512

DOCKET
01-AFC-18C
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DATE: November 4, 2009

TO: Interested Parties

FROM: Matt Trask, Amendment Project Manager

SUBJECT: Henrietta Peaker Project (HPP) (01-AFC-18C)
Staff Analysis of Proposed Modifications to the California Energy Commission's Final Decision Approving the HPP

On October 10, 2008, GWF Energy, LLC, filed a petition with the California Energy Commission to amend the Energy Commission Decision for the Henrietta Peaker Project (HPP). Staff prepared an analysis of this proposed change, and a copy is available for your information and review.

The HPP project is a 95 MW simple-cycle peaking power plant located southwest of the city of Lemoore in a rural area of Kings County. The project was certified by the Energy Commission on January 31, 2002, and began commercial operation on July 1, 2002. The proposed modifications would allow GWF to convert the facility from single-cycle to combined-cycle operations by adding two Once-Through Steam Generators, an air-cooled condenser and a steam turbine, which would increase overall generating capacity of the facility to 120 MW without increasing fuel use.

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality, public health and safety, and proposes revisions to existing conditions of certification for Air Quality, Biological Resources, Cultural Resources, Facility Design, Land Use, Noise and Vibration, Soil and Water Resources, Traffic and Transportation, Transmission System Engineering, and Visual Resources. It is staff's opinion that, with the implementation of revised conditions, the project will remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The amendment petition and staff's analysis has been posted on the Energy Commission's webpage at:

http://www.energy.ca.gov/sitingcases/henrietta_amendment/documents/index.html

The Energy Commission's Order (if approved) will also be posted on the webpage. Energy Commission staff intends to recommend approval of the petition at the January 13, 2010, Business Meeting of the Energy Commission, though the actual date of the meeting may change. If you have comments on this proposed modification, please submit them at the address below prior to November 20, 2009.

Matt Trask, Amendment Project Manager
California Energy Commission
1516 9th Street, MS-2000
Sacramento, CA 95814

Comments may be submitted by fax to (916) 654-3882, or by e-mail to mtrask@energy.state.ca.us. If you have any questions, please call me at (916) 651-2935.

For further information on how to participate in this proceeding, please contact the Energy Commission Public Adviser's Office, at (916) 654-4489, or toll free in California at (800) 822-6228, or by e-mail at publicadviser@energy.state.ca.us. News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail at mediaoffice@energy.state.ca.us.

Enclosure

Staff Assessment

HENRIETTA PEAKER PLANT

Amendment No.1 (01-AFC-18C)
Kings County

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STAFF REPORT

NOVEMBER 2009
(01-AFC-18C)
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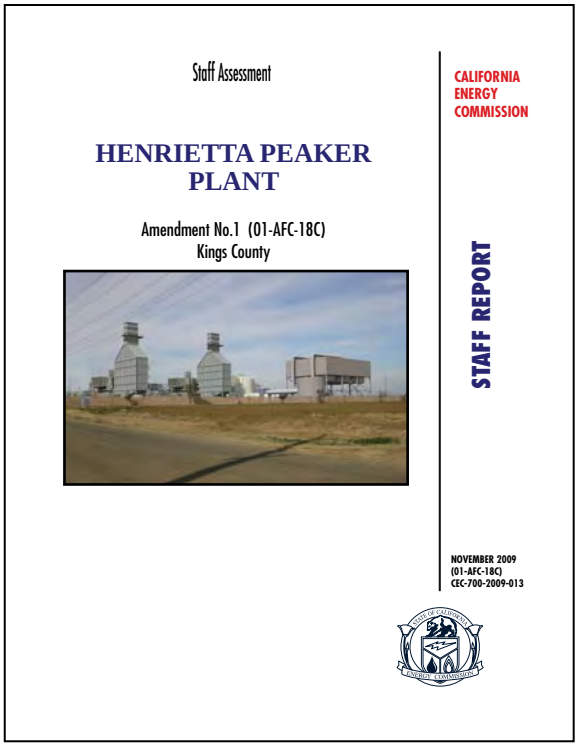

CALIFORNIA ENERGY COMMISSION

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HENRIETTA PEAKER PROJECT (01-AFC-18C)
STAFF ASSESSMENT
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EXECUTIVE SUMMARY

Matt Trask, Amendment Project Manager

INTRODUCTION

On October 1, 2008, the California Energy Commission received a petition from GWF Energy, LLC (GWF) to amend the Energy Commission Decision for the Henrietta Peaker Project (HPP) (01-AFC-18C).

The purpose of the Energy Commission's amendment review process in this Staff Assessment (SA) is to assess the direct, indirect and cumulative impacts of the amendment on the environment, public health and safety, and the electric transmission system. The SA presents the conclusions, recommendations, and proposed conditions of certification that staff believes are necessary to mitigate or avoid potential significant adverse environmental impacts and to satisfy laws, ordinances, regulations and standards (LORS) that have changed since the original project was certified. The review process includes an evaluation of the consistency of the proposed changes with the Energy Commission's Decision and with current applicable LORS (Title 20, Calif. Code of Regulations, section 1769).

This SA contains the Energy Commission staff's evaluation of the following technical areas: air quality; biological resources; cultural resources; land use, noise and vibration; public health; socioeconomic resources; soil and water resources; traffic and transportation; transmission line safety and nuisance; visual resources; waste management; facility design; geology and paleontology; power plant efficiency; power plant reliability; and transmission system engineering.

PROJECT LOCATION AND DESCRIPTION

The 95-megawatt project was certified by the Energy Commission on January 31, 2002, and began operations on July 1, 2002. The facility is located adjacent to Pacific Gas & Electric's (PG&E) 70 kV Henrietta Substation approximately 1 mile south of Highway 198 on 25th Avenue, southwest of the town of Lemoore in Kings County. It consists of two aero-derivative General Electric LM6000 combustion turbine-generator sets operating in simple-cycle mode. It presently is licensed to use up to 150 acre-feet per year (afy) of surface water for plant cooling and other uses.

GWF requests to convert the HPP to the GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta) by adding two Once-Through Steam Generators (OTSGs) to recover heat from the exhaust of the existing turbines and create steam to power a new 25 MW steam turbine generator. The OTSGs differ from more common heat-recovery steam generators (HRSGs) found at combined-cycle plants in that the OTSGs are constructed to withstand operation of the plant in simple-cycle operations for extended periods, providing considerable flexibility in how GWF would operate the plant and its ability to deliver power to the grid.

To avoid the need for extensive new water use at the converted plant, GWF proposes to install a 74-foot tall, 120-foot long, 84-foot wide air-cooled condenser to convert steam

exiting the steam turbine back into liquid to be pumped back into the OTSGs. The combined-cycle plant would also utilize a wet-surface air cooler (WSAC) for lube-oil cooling, which uses a spray of water onto the surface of the heat exchanger when air temperatures are above 98 degrees. GWF proposes to increase present water use at the plant by approximately 5 percent in order to supply makeup water for the OTSGs and WSAC.

GWF also intends to demolish and remove the two existing oxidation catalyst and selective catalytic reduction (SCR) systems, including the existing catalyst housing and 85-foot stacks, and add a new oxidation catalyst system within each OTSG. The new system would control carbon monoxide (CO) emissions to outlet concentration of less than 3 parts per million volume dry (ppmvd) at 15 percent oxygen (O2) and volatile organic compounds (VOC) emissions to outlet concentration of less than 2 ppmvd at 15 percent O2 during simple- cycle and combined-cycle operation. The new SCR system within each OTSG would reuse the existing aqueous ammonia storage system to control oxides of nitrogen (NOx) emissions to less than 2 ppmvd at 15 percent O2 during combined-cycle operation.

These proposed modifications would require changes to the site layout concerning location of the new and existing structures, such as relocation and expansion of the present stormwater retention basin, resulting in expanding the fenced area of the project site by about 3.9 acres to about 9.9 acres within GWF's 20-acre plot. In addition, GWF requests to add a temporary area for construction worker parking and secondary laydown. The additional 4.5 acres, located adjacent to the present HPP site on GWF land used for the same purpose during construction of the existing plant, would allow for a more efficient use of the project site during construction and safer, more cost-effective construction staging.

A more complete description of the project, including maps of the project site and vicinity, is contained in the **PROJECT DESCRIPTION** section of this SA. (**See PROJECT DESCRIPTION Figure 1 & 2**)

NECESSITY FOR THE PROPOSED MODIFICATIONS

The project owner requested the proposed modifications in order to increase the efficiency and operational flexibility of the plant, and therefore be better able to provide the power and ancillary services being solicited by area utilities. If approved and constructed, the modified plant would be able to operate both in simple-cycle and combined-cycle modes, and in combined-cycle mode would be able to produce an additional 25 MW of power, without any increase in fuel use.

PROJECT FUNDING AND OWNERSHIP

GWF Henrietta, LLC, a subsidiary of GWF Energy, LLC, would be the sole project owner of the GWF Henrietta facility.

SUMMARY OF STAFF ANALYSIS

The Executive Summary table below shows all the technical areas contained in the SA and also indicates where staff has recommended changes to the existing HPP license and conditions of certifications. Staff believes that by requiring changes to the existing technical area conditions identified below, the potential impacts of the proposed conversion to combined-cycle operations would be reduced to less than significant levels. The details of the proposed condition changes can be found under their appropriate technical headings in this SA.

Executive Summary Table
Summary of Technical Sections Conditions of Certification

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

Energy Commission technical staff reviewed the petition to amend for potential environmental effects and consistency with applicable laws, ordinances, regulations and standards (LORS). Where applicable, staff referred to previous environmental assessments in the attached analyses of GWF's amendment petition. Staff determined that the technical areas of hazardous materials management, power plant efficiency and reliability, public health, socioeconomics, transmission line safety and nuisance, and worker safety and fire protection were not affected by the proposed changes, and no revisions or new conditions of certification are needed to ensure the project remains in compliance with all applicable LORS. Staff also determined no additional analysis was needed for the areas of hazardous materials management, and worker safety and fire protection.

Staff determined that the following technical or environmental areas would be affected by the proposed project change to combined-cycle operations and has proposed new and revised conditions of certification in order to assure compliance with LORS and/or to reduce potential environmental impacts to a less than significant level.

- **Air Quality**: Changes to air quality conditions of certification relate largely to the changes in the conditions imposed in the Air Permit for the facility, as well as

updating air quality standards and the best management practices employed to reduce project impacts.

- **Biological Resources**: Staff recommends elimination of seven Biological Resources Conditions of Certification and changes to five other Conditions originally contained in the Decision to reflect the proposed minor project changes and remain relevant to the proposed GWF Henrietta project.
- **Cultural Resources:** The changes to Cultural Resources Conditions of Certification were made to more appropriately provide for the discovery of as yet unknown buried archaeological deposits, reflecting changing standards and practices now recommended by staff compared to when the project's license was originally issued, and to assure the proposed project's compliance with all applicable LORS, but also allows for elimination of certain construction monitoring under certain circumstances.
- **Facility Design:** The Facility Design Conditions of Certification were modified to include several additional components that would be installed as a result of the changed design of the project, such as the steam turbine and its step-up transformer, and to note an update to the applicable Building Codes since the project was originally licensed.
- **Geology, Mineral Resources and Paleontology:** As with Cultural Resources, Conditions of Certification related to Geology, Mineral Resources and Paleontology were modified to ensure protection of any paleontological resources that might be encountered during construction, reflecting changing standards and practices now recommended by staff compared to when the project's license was originally issued, and to assure the proposed project's compliance with all applicable LORS.
- **Land Use:** One Land Use-related Condition of Certification was modified to allow review of the required setbacks for the project by the Kings County Planning Department.
- **Noise:** One Noise-related Condition of Certification was revised to more accurately reflect the appropriate conditions for verifying project noise levels by specifying the power level at which the monitoring should be done, and a new condition was added restricting the time that high-pressure steam blows are allowed for testing.
- **Soil & Water Resources:** The Soil & Water Resources Conditions of Certification were modified to reflect the changes in water use and the impact mitigation for the project, which consists of groundwater banking in the local area.
- **Traffic and Transportation:** One Traffic and Transportation Condition of Certification requiring construction period parking was eliminated because such parking area was established during the original project construction and would be re-used for the amendment-related work.
- **Transmission System Engineering:** The TSE Conditions of Certification were revised to reflect the changed design of the project, and to ensure proper interconnection and synchronization of the steam turbine generator.
- **Visual Resources:** Staff has proposed visual resources Condition of Certification **VIS-7** to screen the construction laydown and parking area outside the boundary of the HPP site.

STAFF RECOMMENDATIONS AND CONCLUSIONS

Staff concludes that the following required findings mandated by Title 20, section 1769(a)(3) of the California Code of Regulations can be made and will recommend approval of the petition to the Energy Commission:

A. There will be no new or additional unmitigated significant environmental impacts associated with the proposed changes,

B. The facility will remain in compliance with all applicable laws, ordinances, regulations and standards,

C. The change will be beneficial to the project owner by increasing operational efficiencies and enhancing the project's economics. Moreover, the change will be beneficial to the State of California by increasing power in an area of need (the Greater Fresno Area in particular and Southern California in general), and help alleviate congestion on key transmission interties connecting Northern and Southern California.

D. There has been a substantial change in circumstances since the Energy Commission certification justifying the change. The combined-cycle will provide superior fuel economy and environmental performance compared to the present simple-cycle configuration.

INTRODUCTION

Testimony of Matt Trask

PURPOSE OF THIS REPORT

The Staff Assessment (SA) presents the California Energy Commission (Energy Commission) staff's independent analysis of the GWF Energy's LLC's October 2008 Petition to Amendment the Energy Commission's license for the Henrietta Peaker Project (HPP) (01-AFC-18C). This SA is a staff document. It is neither a Committee document, nor a draft decision.

The SA describes the following:

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

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

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

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

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

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

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

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

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

The SA contains an Executive Summary, Introduction, Project Description, and the environmental, engineering, and public health and safety analysis of the proposed amendment. The technical areas included in the SA are: air quality (including greenhouse gas analysis); biological resources; cultural resources; land use; noise and vibration; public health; socioeconomic resources; soil and water resources; transmission line safety and nuisance; traffic and transportation; visual resources; waste management, facility design; geology, mineral resources and paleontology; power plant efficiency; power plant reliability; and transmission system engineering. Staff determined that no additional analysis was needed over that done for the original project license in the areas of worker safety and fire protection, and hazardous materials handling.

Each of the technical area assessments includes a discussion of:

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

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

ENERGY COMMISSION AMENDMENT PROCESS

The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or

local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, §25500). The Energy Commission must review Petitions to Amend to assess potential environmental and public health and safety impacts, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws and standards (Pub. Resources Code, §25523 (d)).

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

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

Staff conducts its environmental analysis in accordance with the requirements of CEQA. The Energy Commission's site certification and amendment program has been certified by the Resources Agency as CEQA-equivalent (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other applicable portions of CEQA.

Staff uses the SA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. If controversy or disagreement over the SA arises after it is published, Staff may conduct one or more workshops to discuss their findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshop(s) and written comments, staff will refine their analyses, correct any errors, and finalize conditions of certification to reflect areas where staff has reached agreement with the parties. These refined analyses, along with responses to written comments on the SA, will be published in an errata to the SA.

The Siting Committee has oversight over compliance issues for the Energy Commission and has elected to oversee the HPP amendment petition. If significant controversy or disagreement among parties arise following publication of this SA, all parties will be afforded an opportunity to present evidence and to rebut the testimony of other parties at one or more Committee hearings, thereby creating a hearing record on which a decision on the amendment can be based. The hearing before the Committee would also allow all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies. If no significant controversy nor disagreement among parties arises following publication of the SA, the Siting Committee may choose to not hold hearings on the petition, in which case parties would still be able to address their concerns at the Business Meeting at which the Energy Commission is scheduled to rule upon the petition.

Following any hearings, the Siting Committee's recommendation to the full Energy Commission on whether or not to approve the proposed amendment may be contained

in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is circulated to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. If there is a revised PMPD, it will be circulated for a comment period to be determined by the Committee. At the close of that comment period, the PMPD would be submitted to the full Energy Commission for a decision.

The Energy Commission staff has made a substantial effort to notify interested parties, encourage public participation and notify property owners within 1000 feet of the HPP project and 500 feet of the transmission line. Energy Commission staff mailed Notices of Receipt on October 16, 2008, to interested parties, local libraries, responsible and trustee agencies and to property owners within 1000 feet of the HPP project and 500 feet of the transmission line. Staff also contacted applicable local, regional, state and federal agencies to encourage participation in the amendment process.

AGENCY COORDINATION

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

PROJECT DESCRIPTION

Testimony of Matt Trask

INTRODUCTION

On October 10, 2008, the California Energy Commission received a petition from GWF Energy, LLC (GWF) to amend the Energy Commission Decision for the Henrietta Peaker Plant (HPP) (01-AFC-18C). The 95-megawatt project was certified by the Energy Commission on January 31, 2002, and began operations on July 1, 2002. The facility is located adjacent to Pacific Gas & Electric's (PG&E) 70 kV Henrietta Substation approximately one mile south of Highway 198 on 25th Ave southeast of the city of Lemoore in Kings County. If approved by the Energy Commission, construction of the modified facility is expected to commence in February 2011 and last for 15 months.

The petition contains several modifications, the most notable being the installation of an air-cooled condenser, a steam-turbine generator, and two Once-Through Steam Generators (OTSGs). All of the proposed modifications are described below.

PROJECT LOCATION

Following the completion of the certification process in January 2002, the project owner was granted permission by the Energy Commission to construct the HPP in an unincorporated area of Kings County approximately one mile south of the main entrance gate of the Lemoore Naval Air Station. The existing facility is located adjacent to PG&E's Henrietta Substation, occupying 7 acres of a 20 acre parcel owned by GWF. See **PROJECT DESCRIPTION Figures 1 and 2** for the local setting of this proposed location.

PROJECT FACILITIES

GWF requests to convert the HPP to the GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta) by adding two OTSGs to recover heat from the exhaust of the existing turbines and create steam to power a new 25 MW steam turbine generator. The OTSGs differ from more common heat-recovery steam generators (HRSGs) found at combined-cycle plants in that the OTSGs are constructed to withstand operation of the plant in simple-cycle operations for extended periods, providing considerable flexibility in how GWF would operate the plant and its ability to deliver power to the grid.

To avoid the need for extensive new water use at the converted plant, GWF proposes to install a 74-foot tall, 240-foot long, 42-foot wide air-cooled condenser to convert steam exiting the steam turbine back into liquid to be pumped back into the OTSGs. The combined-cycle plant would also utilize a wet-surface air cooler (WSAC) for lube-oil cooling, which uses a spray of water onto the surface of the heat exchanger when air temperatures are above 98 degrees. GWF proposes to increase present water use at the plant by approximately 5 percent, or 8 acre-feet per year (afy) in order to supply makeup water for the OTSGs and WSAC. The increased water use would come from the project's existing service connection from the Westlands Water District (WWD) and Kings County.

These proposed modifications would require changes to the site layout concerning location of the new and existing structures, such as replacing and expanding the present stormwater retention basin by 2,200 cubic yards to accommodate increased stormwater flows off the site. The developed power plant site would be expanded from its present 7 acres to about 9.9 acres of fenced area within GWF's 20 acre parcel.

In addition, GWF requests to add a temporary area for construction worker parking and secondary laydown. The additional 4.5 acres, located adjacent to the present HPP site on GWF land used for the same purpose during construction of the existing plant, would allow for a more efficient use of the project site during construction and safer, more cost-effective construction staging.

Key features of GWF's proposal for the new combined-cycle plant include:

- Addition of two new OTSGs, each receiving the exhaust from one of the existing combustion turbine generators (CTGs). The OTSGs would be vertical flow boilers with rectangular stacks that would be 91.5 feet tall by 13 feet wide by 8.9 feet long.

- Addition of a new 25 MW (net) condensing steam turbine generator (STG) with an associated lube oil cooler.

- Addition of a new 74-foot tall by 240-foot long by 42-foot wide air cooled condenser (ACC) for system heat rejection.

- On-site modifications to the water piping, fire protection, and the storm water drainage collection systems.

- Addition of a new 42 MMBtu/hr, 20-foot tall auxiliary boiler with a stack approximately 4 feet in diameter and 30 feet tall to provide steam turbine seals and air cooled condenser evacuation during OTSG start-up.

- Replacement of the existing HPP storm water retention basin for storm water management. The new basin would be larger than the existing basin by approximately 2,200 cubic yards and relocated to the east side of the site expanding the existing fence line. Cut and fill from the retention basin relocation would be retained onsite and incorporated into filling the existing basin and final facility grading.

- Addition of a new water treatment skid for boiler makeup water.

- Modification of the wastewater treatment system to optimize water supply requirements and minimize off-site wastewater disposal.

- Increase in water consumption of approximately 8 afy for OTSG feedwater makeup and the lube oil cooler makeup, but no change to the water supply or service connection.

- Addition of a generator step-up transformer and circuit breaker into the existing on-site 115 kilovolt (kV) switchyard to transmit the STG power output to the PG&E grid.

- No change to existing off-site transmission lines.
- No change to existing site access.

AIR QUALITY EMISSIONS

The air quality and public health analysis is based on 8,000 hours per year of steady state operations, plus up to 541 hours of start-up and shutdown operations per year. Annual emissions limits and District-required emission reduction credit quantities (offsets) are unchanged from those in the original project license. The project includes use of Best Available Control Technology (BACT) to control NOx, VOCs, sulfur dioxide (SO_2), and PM10/2.5 emissions.

The project would involve demolition and removal of the two existing oxidation catalyst and selective catalytic reduction (SCR) systems, including the existing catalyst housing and 85-foot stacks, and addition of a new oxidation catalyst system within each OTSG. The new system would control carbon monoxide (CO) emissions to outlet concentration of less than 3 parts per million volume dry (ppmvd) at 15 percent oxygen (O2) and volatile organic compounds (VOC) emissions to outlet concentration of less than 2 ppmvd at 15 percent O2 during simple-cycle and combined-cycle operation. Addition of a new SCR system within each OTSG, reusing the existing aqueous ammonia storage system, would control oxides of nitrogen (NOx) emissions to less than 2 ppmvd at 15 percent O2 during combined-cycle operation.

WATER SUPPLY AND WASTE WATER TREATMENT

Makeup water for the OTSGs and WSACs would come from the project's existing service connection from the Westlands Water District (WWD) and Kings County. GWF holds sufficient rights to accommodate the increase of up to 8 acre-feet per year under worst-case conditions. These include entitlements to both Central Valley Project and State Water Project waters from the California Aqueduct through WWD's system, as well as irrigation rights for farmland that GWF owns in the area. Project water use would continue to be mitigated through a set of agreements resulting in groundwater injection at a greater than one to one ratio with total use.

An on-site treatment system using reverse-osmosis and mixed-bed polishing technology would treat the canal water for plant use, though untreated water would be used for other purposes, such as service water and fire protection. Other than the 8 acre-feet for OTSG and WSAC makeup, the quantities of water used at the site would remain nearly the same as under the original design. Waste water generated by the reverse osmosis system would be reclaimed by a waste recovery system, and the mixed bed polishing units would be regenerated off-site, producing no liquid or solid wastes inside GWF Henrietta.

The modified project would include replacing and expanding the existing storm water retention basin for storm water management. The basin would be expanded by approximately by 2,200 cubic yards and moved to the east side of the site to accommodate increased stormwater flows off the site. Excess cut from expansion of the retention basin would be retained on-site and incorporated into the final facility grading.

CONSTRUCTION AND OPERATION

GWF proposes construction to begin on the project as early as the first quarter of 2010 and take approximately 15 months. Commercial operation of GWF Henrietta is expected to begin by the spring of 2011. The construction work force necessary for the project is expected to peak at 154 workers in months 7 through 12. Once the new project is on line, the operational staff required is expected to increase by about 14 employees. The capital cost of the project is expected to be approximately $90 million.

FACILITY CLOSURE

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

REFERENCES

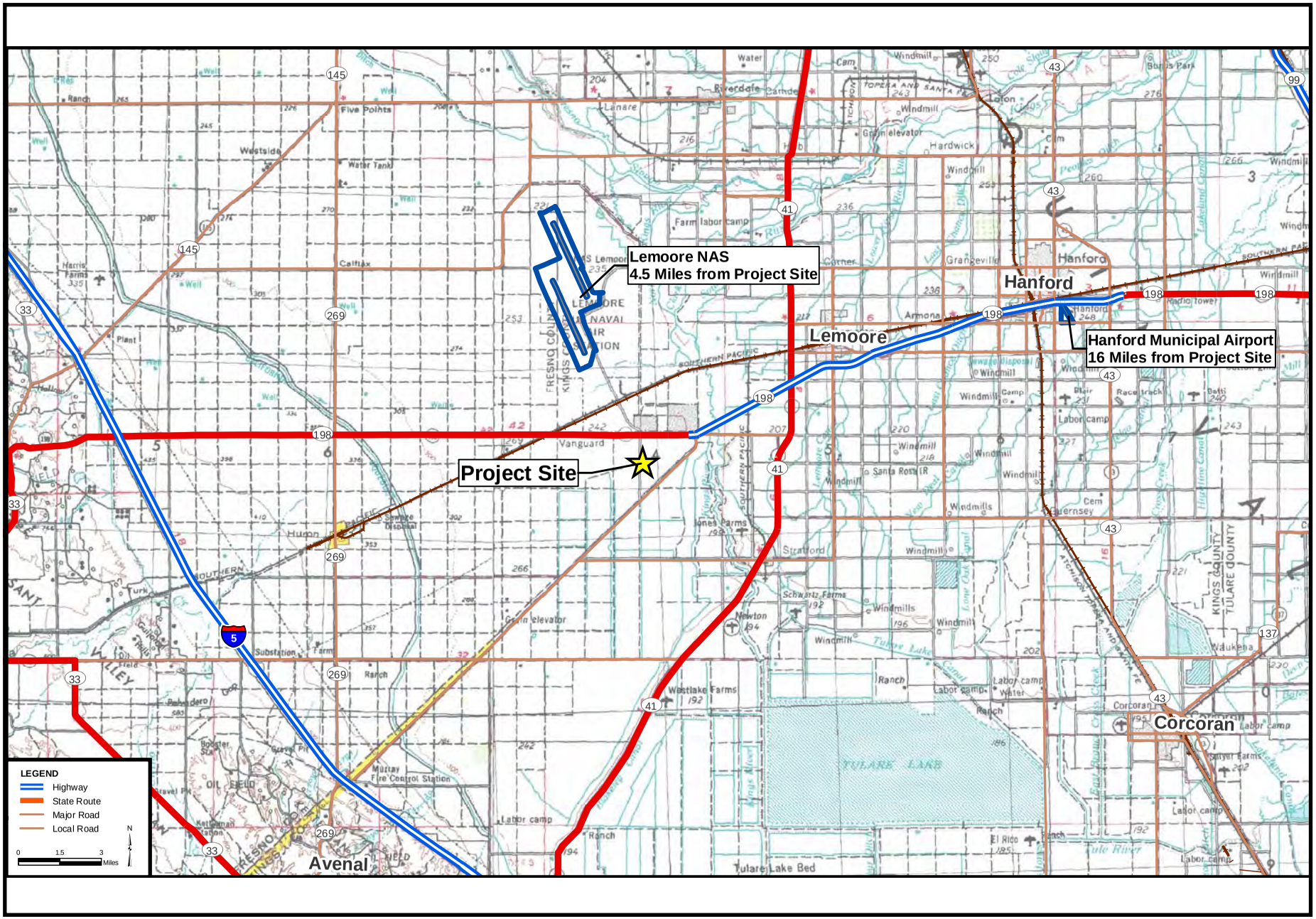
California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Energy Park Peaker Project Application for Certification, Docket No. 01-EP-7, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Energy Park Peaker Project Application for Certification (01-EP-7), Kings County, California, published on December 18, 2001.

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

PROJECT DESCRIPTION - FIGURE 1

GWF Henrietta Amendment Project - Regional Setting

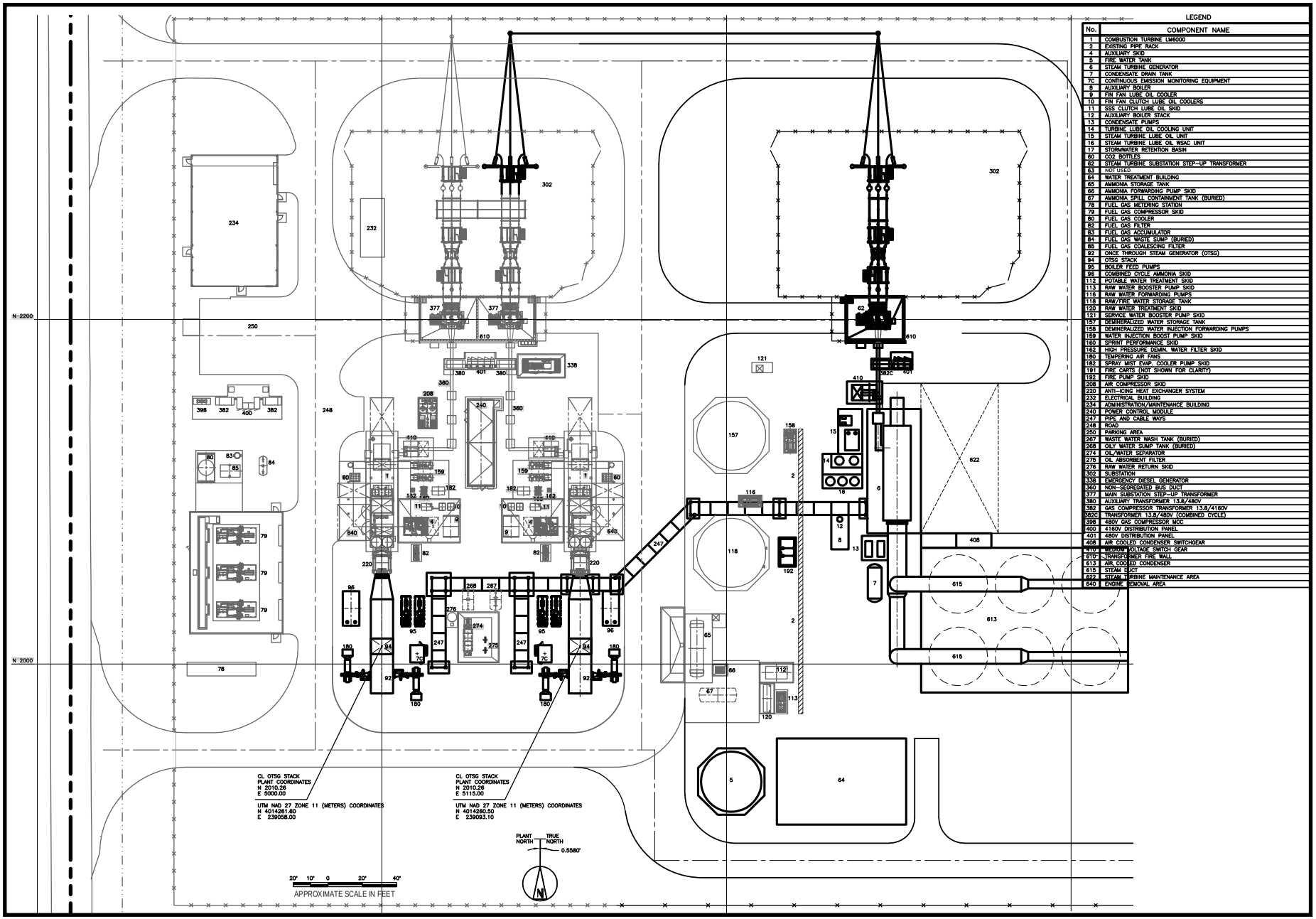


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, NOVEMBER 2009

SOURCE: Henrietta Amendment #1

PROJECT DESCRIPTION - FIGURE 2

GWF Henrietta Amendment Project - General Arrangement



SOURCE: Henrietta Amendment #1

ENVIRONMENTAL ANALYSIS

AIR QUALITY

Testimony of William Walters, P.E.

AMENDMENT REQUEST

GWF proposes to modify the existing Henrietta Peaker Plant (HPP) to create a dual-function power plant. The modified facility, called the GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta) would operate both in simple-cycle mode and combined-cycle mode.

The setting, project emissions, and project impacts are fully updated by this analysis and the Conditions of Certification (COCs) have been revised. All of the District conditions have been revisited by the San Joaquin Valley Air Pollution Control District (SJVAPCD or District), and all of the District Final Determination of Compliance (FDOC) conditions including the additions and revisions required by the District are provided in this analysis. District conditions have been renumbered in some instances. The construction emission mitigation staff COCs have been updated to current staff recommended measures.

The HPP has operated as a “peaker” since it began commercial operations in 2002 to provide the critical peak energy requirements of the State of California under terms and conditions of a Power Purchase Agreement with the California Department of Water Resources. GWF Henrietta would remain capable of operating in simple-cycle mode, without steam generation. The amendment would add two Once-Through Steam Generators (OTSGs), which would utilize the exhaust heat from the two existing Combustion Turbine Generators (CTGs) to generate superheated steam in the combined-cycle mode. Each OTSG would contain a new Selective Catalytic Reduction (SCR) unit to control nitrogen oxide (NOx) emissions from the CTG’s. Generated steam would flow through a new 25 megawatt (MW) (net) condensing steam turbine generator (STG). Low pressure steam from the STG outlet would exhaust to a new air-cooled condenser (ACC) to be condensed, which would return to the OTSGs as feed water.

Emissions from simple-cycle operation without steam generation would remain the same with the exception of a reduction in NOx and carbon monoxide (CO) from the integration of the new SCR and CO oxidation catalyst control systems. CO emissions would be reduced from 6 ppmvd to 3 ppmvd at 15 percent oxygen (O_2), and NOx emissions would be reduced from 3.7 ppmvd to 2.5 ppmvd at 15 percent O_2. The concentration of ammonia used in the SCR process would be limited to 10 ppmvd or less at 15 percent O_2.

In the combined-cycle mode, NOx emissions would be reduced to 2 ppmvd at 15 percent O_2 by a combination of water injection into the CTG combustor and the SCR system. The concentration of ammonia used in the SCR process would be limited to 5 ppmvd or less at 15 percent O_2. No supplementary firing of natural gas in the CTGs would be needed during the combined-cycle operation.

Under both simple- and combined-cycle operations the CO emissions and volatile organic compound (VOC) emissions from the CTG would be controlled by the oxidation catalyst to 3 ppmvd or less and 2 ppmvd or less at 15 percent O_2, respectively.

The proposed modifications would involve substantial changes to almost every aspect of the original air quality analysis because of the substantial changes to the gas turbine operation and newly proposed auxiliary equipment. The new auxiliary equipment with air pollutant emissions includes an auxiliary boiler, a Wet Surface Air Condenser (WSAC) used for auxiliary cooling, and a 460 horsepower diesel fueled firewater pump engine.

To address these changes, the SJVAPCD conducted a new evaluation for GWF Henrietta. The SJVAPCD commenced review of the proposed amendment in December 2008, and issued a Preliminary Determination of Compliance (PDOC) on April 15, 2009 (SJVAPCD 2009a) and a FDOC on August 4, 2009 (SJVAPCD 2009b).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

At the time of certification, LORS applicable to Air Quality were identified in the Staff Assessment for the project. These LORS would continue to apply to the amended project with the following revisions:

AIR QUALITY Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
40 Code of Federal Regulations (CFR) 52	Nonattainment New Source Review (NSR) requires a permit and requires Best Available Control Technology (BACT) and offsets. Permitting and enforcement delegated to SJVAPCD. Prevention of Significant Deterioration (PSD) requires major sources to obtain permits for attainment pollutants. A major source for a combined-cycle combustion turbine is defined as any one pollutant exceeding 100 tons per year. Since the emissions from GWF Henrietta would not exceed 100 tons per year, PSD does not apply.
40 CFR 60 Subpart Dc	Requires fuel use record keeping for natural gas fired boilers with heat input rating between 10 and 100 MMBtu/hr. No emission performance standards apply to natural gas fired boilers under this regulation. Enforcement delegated to SJVAPCD.
40 CFR 60 Subpart IIII	Regulates emissions and provides other operating and recordkeeping requirements for 2009 model year and later emergency firewater pump stationary compression ignition internal combustion engine with an engine power ratings between 130≤kW≤560 (175≤hp≤750). Enforcement delegated to SJVAPCD.
40 CFR 60 Subpart KKKK	New Source Performance Standard for gas turbines: 15 parts per million (ppm) NOx at 15%O_2 and fuel sulfur limit of 0.060 lbs SOx per million Btu heat input. BACT will be more restrictive. Enforcement delegated to SJVAPCD.
40 CFR Part 70	Title V: Federal permit. Title V permit application is required within one year of start of operation. Permitting and enforcement delegated to SJVAPCD.
40 CFR Part 72	Acid Rain Program. Requires permit and obtaining sulfur oxides credits. Permitting and enforcement delegated to SJVAPCD.

Applicable Law	Description
State	
Health and Safety Code (HSC) Section 40910-40930	Permitting of source needs to be consistent with Air Resource Board (ARB) approved Clean Air Plans.
HSC Section 41700	Restricts emissions that would cause nuisance or injury.

Applicable Law	Description
State	
California Code of Regulations (CCR) Section 93115	Airborne Toxics Control Measure for Stationary Compression Ignition Engines. Limits the types of fuels allowed, established maximum emission rates, establishes recordkeeping requirements.

Applicable Law	Description
Local – San Joaquin Valley Air Pollution Control District (SJVAPCD) Rules and Regulations	
Regulation I – General Provisions	This regulation sets forth requirements and standards for stack monitoring, source sampling, and breakdown events.
Regulation II – Permits	This regulation sets forth the regulatory framework of the application for and issuance of construction and operation permits for new, altered and existing equipment. Included in these requirements are the federally delegated requirements for New Source Review, Title V Permits, and the Acid Rain Program. Regulation II Rule 2201 establishes the pre-construction review requirements for new, modified or relocated facilities, in conformance with the federal New Source Review regulation to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the San Joaquin Valley is not unnecessarily restricted. This regulation establishes Best Available Control Technology (BACT) and emission offset requirements. Regulation II, Rule 2520 defines the permit application and issuance as well as compliance requirements associated with the Title V federal permit program. Any new source which qualifies as a Title V facility must obtain a Title V permit within 12 months of starting operation modification of that source. Regulation II, Rule 2540 incorporates the requirements for the Acid Rain Program, including the requirement for a subject facility to obtain emission allowances for SOx emissions as well as fuel sampling and/or continuous monitoring to determine SOx, NOx, and carbon dioxide (CO_2) emissions from the facility.
Regulation IV – Prohibitions	This regulation sets forth the restrictions for visible emissions, odor nuisance, various air emissions, and fuel contaminants. Regulation IV incorporates provisions of 40 CFR Part 60, Chapter I, and is applicable to all new, modified, or reconstructed sources of air pollution. Sections of this regulation apply to stationary gas turbines (40 CFR Part 60 Subpart KKKK), where this subpart establish limits of NO_2 and SO_2 emissions from the gas turbines as well as monitoring and test method requirements. Sections of this regulation also apply to the auxiliary boiler (Subpart Dc) and to the firewater pump engine (Subpart IIII). This regulation also specifies additional performance standards for stationary gas turbines, boilers and internal combustion engines.
Regulation V – Procedures before the Hearing Board	Establishes the procedures for reporting emergencies and emergency variances.
Regulation VIII – Fugitive PM10 Prohibitions	This regulation sets forth the requirements and performance standards for the control of emissions from fugitive dust causing activities.

SETTING

AIR QUALITY STANDARDS AND ATTAINMENT STATUS

The Federal Clean Air Act and the California Clean Air Act both require the establishment of standards for ambient concentrations of air pollutants, called ambient

air quality standards (AAQS). The state AAQS, established by the California Air Resources Board (ARB), are typically lower (more protective) than the federal AAQS, which are established by the United States Environmental Protection Agency (U.S.EPA). The state and federal air quality standards are listed in **AIR QUALITY Table 2**. The averaging times for the various air quality standards, the times over which they are measured, range from one-hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 or μg/m^3, respectively).

AIR QUALITY Table 2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O_3)	8 Hour	0.075 ppm (147 μg/m^3)	0.070 ppm (137 μg/m^3)
	1 Hour	--	0.09 ppm (180 μg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 μg/m^3)	9.0 ppm (10 μg/m^3)
	1 Hour	35 ppm (40 μg/m^3)	20 ppm (23 μg/m^3)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm (100 μg/m^3)	0.03 ppm (57 μg/m^3)
	1 Hour	--	0.18 ppm (339 μg/m^3)
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.030 ppm (80 μg/m^3)	--
	24 Hour	0.14 ppm (365 μg/m^3)	0.04 ppm (105 μg/m^3)
	3 Hour	0.5 ppm (1300 μg/m^3)	--
	1 Hour	--	0.25 ppm (655 μg/m^3)
Respirable Particulate Matter (PM10)	Annual Arithmetic Mean	--	20 μg/m^3
	24 Hour	150 μg/m^3	50 μg/m^3
Respirable Particulate Matter (PM2.5)	Annual Arithmetic Mean	15 μg/m^3	12 μg/m^3
	24 Hour	35 μg/m^3	--
Sulfates (SO_4)	24 Hour	--	25 μg/m^3
Lead	30 Day Average	--	1.5 μg/m^3
	Calendar Quarter	1.5 μg/m^3	--
Hydrogen Sulfide (H_2S)	1 Hour	--	0.03ppm (42 μg/m^3)
Vinyl Chloride (Chloroethene)	24 Hour	--	0.03ppm (42 μg/m^3)
Visibility Reducing Particulates	8 Hour	--	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

Source: ARB 2009a.

The project site is located in the vicinity of the city of Lemoore in Kings County. The project site is located within the San Joaquin Valley Air Basin (SJVAB) under the jurisdiction of SJVAPCD. The SJVAB is designated as non-attainment for the federal and state ozone and PM2.5 standards, and the state PM10 standard. This area is designated as attainment for the federal PM10 standard and the federal and state CO, NOx, and SOx standards. **AIR QUALITY Table 3** summarizes the area's attainment status for various applicable state and federal standards. The ambient air quality standards that staff uses as a basis for determining project significance are health-based standards. They are set at levels to adequately protect the health of all members of the public, including those most sensitive to adverse air quality such as the aged, people with existing illnesses, and infants and children, while providing a margin of safety.

AIR QUALITY Table 3
Federal and State Attainment Status for San Joaquin Valley Air Basin

Pollutant	Federal Classification	State Classification
Ozone	Extreme Nonattainment[b]	Severe Nonattainment
PM10	Attainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
NO_2	Attainment[a]	Attainment
CO	Attainment[a]	Attainment
SO_2	Attainment[a]	Attainment

Source: U.S.EPA 2009. ARB 2009b
Note(s): [a] Attainment = attainment or unclassified
[b] Based on redesignation request that should be formalized later in 2009, the actual current 8-hour classification is severe.

CRITERIA POLLUTANT AIR QUALITY DATA

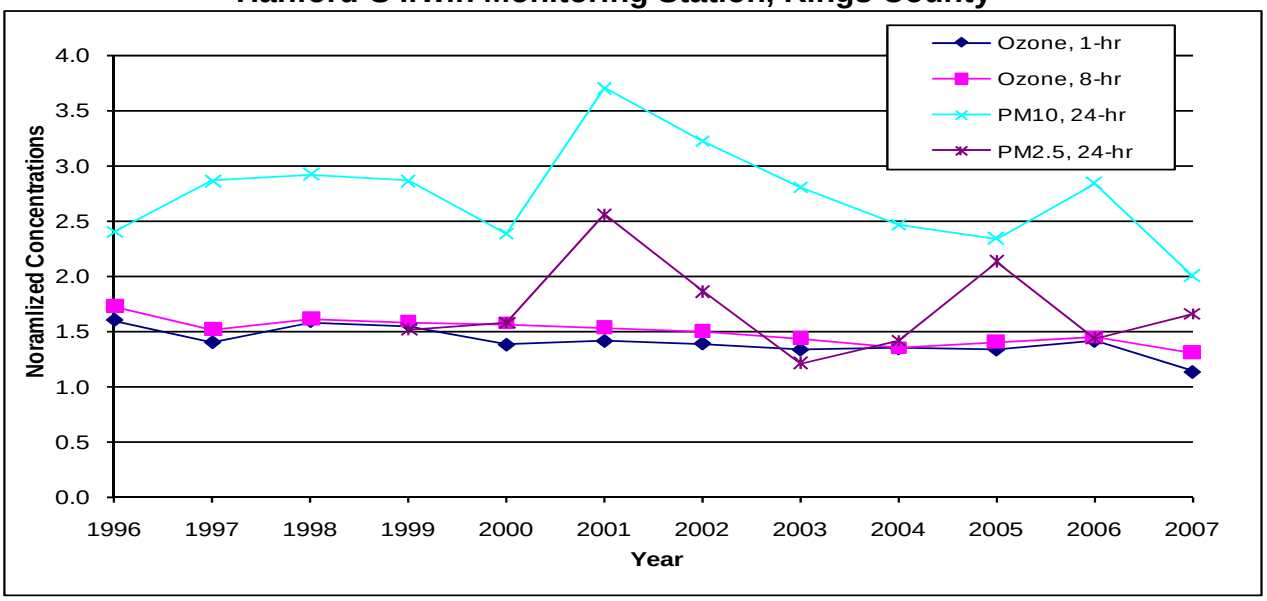
Ambient air quality monitoring data for ozone, PM10, PM2.5, CO, NO_2, and SO_2, for the years between 2002 through 2007 at the most representative monitoring stations for each pollutant are shown in **AIR QUALITY Table 4** and the 1-hour and 8-hour ozone, and 24-hour PM10 data for the years 1996 through 2007 are compared to the most restrictive applicable standards in **AIR QUALITY Figure 1**. The closest monitoring stations from the site are the Hanford-South Irwin Street monitoring station, 15 miles northeast of the project site, the Corcoran-Patterson Avenue monitoring station, 21 miles southeast of the project site, and the Fresno-First Street and Drummond Street monitoring stations, 33 miles northeast of the project site. All ozone, PM10 and NO_2 data presented are collected from the Hanford-South Irwin monitoring station. All PM2.5 data are from Corcoran-Patterson Avenue monitoring station, and all CO data are from Fresno-Drummond Street monitoring station. A complete history of SO_2 concentration is not available; however, SO_2 is not expected to be a critical pollutant in this study since this area has been designated as attainment for SO_2 and the project does not emit SO_2 in high concentrations. The 2007 SO_2 concentration data is collected from the Fresno First Street monitoring station.

AIR QUALITY Table 4
Criteria Pollutant Summary Maximum Ambient Concentrations (ppm or µg/m^3)

Pollutant	Averaging Period	Units	2002	2003	2004	2005	2006	2007	Limiting AAQS
Ozone	1 hour	ppm	0.125	0.120	0.121	0.120	0.127	0.102	0.09
Ozone	8 hours	ppm	0.105	0.100	0.094	0.098	0.101	0.091	0.07
PM10 [a]	24 hours	µg/m^3	161	140	123	117	142	100	50
PM10	Annual	µg/m^3	54.8	47.5	43.6	41	46.8	44.4	20
PM2.5 [a]	24 hours	µg/m^3	65.1	42.2	49.4	74.5	50.1	57.9	35
PM2.5	Annual	µg/m^3	21.5[b]	16.2	17.4[b]	17.5	16.9[b]	21.2	12
NO_2	1 hour	ppm	0.067	0.076	0.069	0.072	0.073	0.058	0.18
NO_2	Annual	ppm	0.014	0.013	0.012	0.012	0.012	0.011	0.03
CO	1 hour	ppm	5.2	3.6	3.5	2.8	4.0	4.4	20
CO	8 hours	ppm	3.54	2.56	2.73	2.33	3.31	2.37	9.0
SO_2	1 hour	ppm	--	--	--	--	--	0.13	0.25
SO_2	24 hours	ppm	--	--	--	--	--	0.031	0.04
SO_2	Annual	ppm	--	--	--	--	--	0.007	0.03

Source: ARB 2009c, ARB 2008
Notes: [a] Exceptional PM concentration events, such as those caused by wind storms may be included in data presented.
[b] State arithmetic mean is not available. Instead, national annual average PM2.5 data are used.

AIR QUALITY Figure 1
1996-2007 Historical Ozone and PM Air Quality Data
Hanford-S Irwin Monitoring Station, Kings County



Source: ARB 2009c, ARB 2008
Note: The highest measured ambient concentrations of various criteria air contaminants were divided by their applicable standard and provided as a graphical point. Any point on the chart that is greater than one means that the measured concentrations of such air contaminant exceed the standard, and any point that is less than one means that the respective standard is not exceeded for that year. For example the 1-hour ozone concentration in 1998 is 0.143 ppm/0.09 ppm standard = 1.6.

Ozone

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted NOx and hydrocarbons (VOCs) in the presence of sunlight to form ozone.

As **AIR QUALITY Table 4** and **AIR QUALITY Figure 1** indicate, the 1-hour and 8-hour ozone concentrations measured in Kings County have been slowly decreasing over time. The collected air quality data (not shown) indicate that the ozone violations occurred primarily during May through September.

Nitrogen Dioxide

The entire air basin is classified as attainment for the state and federal NO_2 standards. Approximately 90 percent of the NOx emitted from combustion sources is nitric oxide (NO), while the balance is NO_2. NO is oxidized in the atmosphere to NO_2, but some level of photochemical activity is needed for this conversion. The highest concentrations of NO_2 typically occur during the fall. The winter atmospheric conditions can trap emissions near the ground level, but lacking significant photochemical activity (sun light), NO_2 levels are relatively low. In the summer the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions disperse pollutants, preventing the accumulation of NO_2. The NO_2 concentrations in the project area are well below the state and federal ambient air quality standards.

Carbon Monoxide

The area is classified as attainment for the state 1-hour and 8-hour CO standards. The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground. The project area has a lack of significant mobile source emissions and has CO ambient concentrations that are well below the state and federal ambient air quality standards.

Particulate Matter (PM10) and Fine Particulate Matter (PM2.5)

Particulate Matter (PM10 and PM2.5) can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Respirable particulate matter, or PM10, is derived from a combination of sources including fugitive dust and combustion particulate and secondary particulate formation. Fine particulate matter, or PM2.5, is derived mainly from either the combustion of materials, or from precursor gases (SOx, NOx, and VOC) through complex reactions in the atmosphere. PM2.5 consists mostly of sulfates, nitrates, ammonium, elemental carbon, and a small portion of organic and inorganic compounds.

The area is non-attainment for the state and federal PM2.5 standards and state PM10 standards. As shown in **AIR QUALITY Figure 1**, PM10 and PM2.5 concentrations were much higher than the state 24-hour PM10 standard in the recent 12-year history.

Sulfur Dioxide

The entire air basin is classified as attainment for the state and federal SO_2 standards. Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. The project area's SO_2 concentrations are below the state and federal ambient air quality standards.

Summary

In summary, staff recommends the background ambient air concentrations in **AIR QUALITY Table 5** for use in the modeling and impacts analysis. The maximum criteria pollutant concentrations from the past three years of available data collected at the most representative monitoring stations are used to determine the recommended background values.

The background concentrations for PM10 and PM2.5 are at or above the most restrictive existing ambient air quality standards, while the background concentrations for the other pollutants are all well below the most restrictive existing ambient air quality standards.

The pollutant modeling analysis was limited to the pollutants listed above in **AIR QUALITY Table 5**; therefore, recommended background concentrations were not determined for the other criteria pollutants (ozone, lead, visibility, etc.).

AIR QUALITY Table 5
Staff Recommended Background Concentrations (µg/m^3)

Pollutant	Averaging Period	Recommended Background	Limiting Standard	Percent of Standard
NO_2	1 hour	137.5	339	41%
	Annual	22.8	57	40%
PM10	24 hour	142	50	284%
	Annual	46.8	20	234%
PM2.5	24 hour	74.5	35	213%
	Annual	21.2	12	177%
CO	1 hour	5,060	23,000	22%
	8 hour	3,678	10,000	37%
SO_2	1 hour	340.6	655	52%
	3 hour	195.0	1,300	15%
	24 hour	81.4	105	78%
	Annual	18.7	80	23%

Source: ARB 2009c, GWF Energy 2008a, ARB 2008, and Energy Commission Staff Analysis

PROJECT DESCRIPTION CHANGES

EQUIPMENT DESCRIPTION CHANGES

Electricity would be produced by the two existing CTGs and the single, new STG. The followings are the major components of the new amended generating system (GWF Energy 2008a).

Combustion Turbine Generator (CTG): This equipment is unchanged from the HPP Final Decision (CEC 2002) and consists of two natural gas-fired General Electric LM6000 CTGs equipped with water injection and evaporative inlet air coolers.

Once Through Steam Generator (OTSG): The OTSGs would recover heat from the exhaust gases of the CTGs to convert de-mineralized feed-water into high pressure steam. There would be one OTSG per existing CTG. Each OTSG would be a continuous tube heat exchanger in which preheating, evaporation, and superheating of the feed water would take place consecutively. Each OTSG would be equipped with SCR and oxidation catalyst equipment.

Steam Turbine Generator (STG): Steam generated in the OTSGs would be routed to a new two-pressure STG. The steam turbine would extract the thermal energy from the pressurized steam and convert it to mechanical work. The generator, coupled to the steam turbine, would convert the mechanical work into electricity.

Air Cooled Condenser (ACC): The project would add one new ACC with sufficient surface area to reject heat from the steam cycle to the atmosphere. The ACC would be elevated and supported by a steel structure to ensure adequate air flow.

Auxiliary Boiler: A natural gas fueled 42 MMBtu/hr auxiliary steam boiler would be used to generate warming steam for steam turbine casings and steam piping systems during preparation for the start-up of the combined-cycle power plant. The auxiliary boiler would have a 30 foot tall, 48 inch diameter stack and fitted with 6 ppm ultra low-NOx burner technology.

Wet surface air cooler (WSAC): A 305 gallon per minute (gpm) WSAC would be used to reject heat from a fin-fan heat exchanger in the auxiliary cooling water system. The auxiliary cooling water system is provided for the STG lube oil cooler, STG generator cooler, STG hydraulic control system, boiler feed pump lube oil, and seal water coolers.

460 hp Firewater Pump Engine: A 460 hp Cummins model CFP15E-F10 Tier 3 certified diesel-fired emergency internal combustion engine is proposed to power a new firewater pump for the site.

EMISSION CONTROLS

The turbines would be equipped with water-injected low NOx combustors and a post-combustion SCR system. Combination of these two features would reduce NOx emissions to 2.5 ppmvd at 15 percent O_2 in the simple-cycle mode, and 2.0 ppmvd at 15 percent O_2 in combined-cycle mode.

Additionally an oxidation catalyst system would be used to reduce CO and VOC emissions from the turbines to 3 ppmvd and 2 ppmvd (corrected to 15 percent O_2) respectively when operating in either simple-cycle or combined-cycle mode. Particulate matter and SO_2 emissions would be controlled by exclusively firing pipeline quality natural gas using inlet air filtration and mist eliminator filters on lubricating oil vents.

The natural gas-fired auxiliary boiler would be equipped with an ultra-low NOx emissions burner that would achieve a 6 ppm NOx concentration and would also achieve a 50 ppm CO concentration (corrected to 3 percent O_2). The auxiliary boiler would also be fired exclusively on natural gas to control PM and SOx emissions.

The WSAC would employ a mist eliminator that would reduce mist, and reduce associated PM emissions, to no more than 0.005 percent of the water spray flow.

The emergency fire pump would be a Tier III engine, which would use diesel fuel with no more than 15 ppm by weight fuel sulfur.

To ensure that the systems perform correctly, continuous emissions monitors (CEMs) would be installed on the turbine OTSG stacks prior to release to the atmosphere. The existing CEM systems would be used to sample, analyze, and record fuel gas flow rate, exhaust gas flow rate, NOx and CO concentration levels, and percentage of O_2 in the stack exhaust gas. An existing SCR inlet NOx analyzer would be used to calculate ammonia slip. This system would generate emission data reports in accordance with permit requirements and would send alarm signals to the plant control room when emission levels approach or exceed pre-selected limits.

AMENDED PROJECT EMISSIONS

Construction Activities and Emissions

Construction of the project would includes the demolition of the two existing oxidation catalyst and SCR systems, demolition of the associated exhaust stacks, and installation of the two new OTSGs, the new 25 MW steam condensing turbine generator, new ACC, the new auxiliary boiler and other auxiliary equipment. The total duration for the

demolition and construction would be approximately 15 months. Construction schedule is based on 12 hours of equipment operation per day and 26 working days per month. 2.9 acres of the existing GWF-owned 20-acre parcel would be dedicated to the proposed amendment and the construction activities for this amendment would disturb 4.5 acres of land for temporary construction laydown and parking.

The existing HPP already has natural gas and water pipelines and transmission infrastructure in place; therefore, no modifications to the offsite linear facilities are required.

In the emissions estimates shown in **AIR QUALITY Table 6**, it was conservatively assumed that the construction equipment would operate 12 hours per day, 26 days per month. The maximum annual construction emissions represent the 12-month period out of the 15-month construction schedule with the highest emissions. The 12-month period with the highest predicted emissions is the period from month 2 through month 13. Total construction emissions during 15 months are presented in **AIR QUALITY Table 7**.

No maximum daily offsite emission rate was provided by the project owner; therefore, staff has estimated the maximum daily emissions based on maximum monthly emissions and the days per month schedule assumption.

AIR QUALITY Table 6
Maximum Daily, Monthly, and Annual Construction Emissions

Maximum Daily Emissions (lbs/day)						
	NOx	CO	VOC	SOx	PM10	PM2.5
Onsite Construction Equipment	99.10	56.90	15.80	0.11	6.98	6.21
Onsite Motor Vehicle	0.05	0.28	0.03	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	14.00	1.34
Onsite Total	99.15	57.18	15.83	0.11	20.70	7.55
Offsite Total	2.70	10.09	0.37	0.02	0.14	0.02
Total	101.85	67.27	16.20	0.13	21.12	7.57
Maximum Monthly Emissions (lbs/month)						
	NOx	CO	VOC	SOx	PM10	PM2.5
Onsite Construction Equipment	2,578.00	1,479.00	410.00	2.9	182.00	1,444.00
Onsite Motor Vehicle	1.27	7.24	0.68	0.02	0.11	1.36
Fugitive Dust	--	--	--	--	4,898.00	538.60
Onsite Total	2,579.27	1,486.24	410.68	2.92	5,080.11	1,983.96
Offsite Total	70.31	262.30	9.50	0.45	31.09	9.26
Total	2,649.58	1,748.54	420.18	3.37	5,111.20	1,993.22
Maximum Annual Emissions (tons/year)						
	NOx	CO	VOC	SOx	PM10	PM2.5
Onsite Construction Equipment	10.48	6.09	1.74	0.01	0.75	0.67
Onsite Motor Vehicle	0.01	0.04	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	2.07	0.23
Onsite Total	10.49	6.13	1.74	0.01	2.82	0.89
Offsite Total	0.26	1.04	0.04	0.00	0.01	0.00
Total	10.75	7.17	1.78	0.01	2.83	0.90

Source: GWF Energy 2008a

AIR QUALITY Table 7
Total Construction Emissions (tons/construction)

	NOx	CO	VOC	SOx	PM10	PM2.5
Onsite Total	10.7	6.2	1.8	0.012	2.8	0.9
Offsite Total	1.3	0.51	0.071	0.0018	0.76	0.13
Total	12.00	6.71	1.87	0.014	3.56	1.03

Source: GWF Energy 2009a

The original Staff Assessment found that mitigation measures would be necessary to avoid the potentially significant impacts of particulate matter and ozone concentrations during construction, and various Conditions of Certification (COCs) were identified and adopted. This conclusion remains applicable for this amendment, and staff recommends COCs, updated to current staff recommendations, to mitigate both fugitive dust and equipment exhaust emissions during construction.

Commissioning Activities and Emissions

The total duration of the commissioning phase for the proposed project is expected to be 65 days. Commissioning activities are conducted to test and tune the CTG performance and ensure emission limits will be met. The commissioning emissions are reduced to the extent feasible by limiting equipment operation during commissioning consistent with the equipment manufacturers' recommended intervals. **AIR QUALITY Table 8** and **9** summarize the commissioning NOx and CO emissions for four testing scenarios that were included in the modeling analysis, which were the four worst-case emission event scenarios out of the 16 different testing scenarios provided by the project owner (GWF Energy 2008a, Attachment C2, Table C2.1). The commissioning event scenario data provided by the project owner consider three different turbine load rates, 45 percent, 50 percent and 100 percent; and provide the peak hourly and total commissioning NOx and CO emissions for each of the sixteen event scenarios.

AIR QUALITY Table 8
Turbine Commissioning Emissions

Scenarios	Turbines/Modeling Load	Emission Rates (lbs/hr)	
		NOx	CO
Steam Blows	1 or 2 / 50%	52.0	20.9
Steam Blows	Both / 50%	39.0	18.2
Verify STG on Turning Gear; Establish Vacuum in ACC Exit Bypass Blowdown to ACC (combined blows) commence tuning on ACC Controls; Finalize Bypass Valve Tuning	1 or 2 /50%	44.8	40.5
Verify STG on Turning Gear; Establish Vacuum in ACC Exit Bypass Blowdown to ACC (combined blows) commence tuning on ACC Controls; Finalize Bypass Valve Tuning	Both / 100%	44.8	40.5

Source: GWF Energy 2008a

AIR QUALITY Table 9
Maximum and Total Turbine Commissioning Emissions

	NOx	CO
Maximum Hourly (lbs/hr per turbine)	52.0	40.5
Total Commissioning Period (tons, both turbines)	8.3	6.3

Source: GWF Energy 2008a

Operational Phase and Emissions

GWF Henrietta would consist of two existing General Electric (GE) LM6000 PC Sprint CTGs, two new OTSGs used to generate steam, a new 25 MW (net) STG, a new ACC, and a 305 gpm WSAC. GWF Henrietta would also include a new 42 MMBtu auxiliary boiler to minimize the duration of the combined-cycle start-up events of the facility, an existing 471 horsepower (hp) diesel fired emergency generator, and a new 460 hp diesel fired water pump engine as a secondary source of fire protection.

Normal operating emission estimates for simple-cycle and combined-cycle operation modes are presented in **AIR QUALITY Table 10**. Start-up and shutdown emission estimates shown in **AIR QUALITY Table 11** are based on vendor data and engineering estimates. Each turbine starts up in the simple-cycle mode. If the turbine transitions to combined-cycle operation, then the turbine would subsequently start up in the combined-cycle mode, resulting in emissions that are the sum of the simple-cycle and combined-cycle start-up emissions. A shutdown event would occur in the same sequenced manner depending on the operating mode.

AIR QUALITY Table 10
Maximum Full Load Normal Operating Emission Rates per Turbine

	NOx	CO [a]	VOC [a]	SO_2	PM10/PM2.5
Simple-cycle	4.2	3.1	1.2	0.33	2.2
Combined-cycle	3.4	3.1	1.2	0.33	2.2

Source: GWF Energy 2008a
Note:
[a] The average annual emission rate for CO and VOC, for the determination of annual emissions, is estimated to be 1.8 and 0.5 lbs/hour, respectively.

AIR QUALITY Table 11
Start-up/Shutdown Emission Rates per Turbine

	NOx	CO	VOC	SO_2	PM10/PM2.5
Simple-cycle					
Startup (lbs/event)[a]	7.7	7.7	0.7	0.1	0.1
Shutdown (lbs/event)[b]	7.7	7.7	0.7	0.1	0.2
Combined-cycle					
Startup (lbs/event)[c]	6.1	3.0	0.5	0.3	2.2
Shutdown (lbs/event)[d]	2.1	1.0	0.2	0.1	0.8

Source: GWF Energy 2008a
Notes:
[a] Simple-cycle startup is based on a 10-minute start cycle.
[b] Simple-cycle shutdown is based on a 10-minute stop cycle.
[c] Combined-cycle startup is based on a 60-minute start cycle.
[d] Combined-cycle shutdown is based on a 20-minute stop cycle.

AIR QUALITY Table 12 presents the worst case hourly emissions rates per turbine. The emissions estimates are based on a startup event, 40 minutes of normal operation and a shutdown event in the simple-cycle mode for NOx, CO, and VOC. The emissions estimates for SO_2 and PM10/PM2.5 are based on 60 minutes of normal operation. Since emission rates during the simple-cycle mode are always higher for NOx, CO and VOC than during the combined-cycle mode, the maximum hourly emissions for those pollutants would occur during the simple-cycle operation.

AIR QUALITY Table 12
Maximum Hourly Emission Rates per Turbine

	NOx	CO	VOC	SO_2	PM10/PM2.5
Simple-cycle	18.2	17.5	2.2	0.33	2.2

Source: GWF Energy 2008a

When operating in simple-cycle mode, GWF Henrietta would retain the current level of normal emissions and emissions concentrations with exception of CO and VOCs emissions. The new emission concentration limits for CO and VOCs would be 3 ppmvd, and 2 ppmvd respectively each at 15 percent O_2. Maximum simple-cycle daily turbine emissions are based on two simple-cycle start-up and shutdown events per turbine. Normal operation duration for maximum simple-cycle emissions is estimated to be 23.3 hours with 100 percent load rate at 15°F. Maximum daily emissions for combined-cycle mode are based on two combined-cycle start-up and shutdown events, with 20.7 hours of normal operation at 100 percent load at 15°F.

The hourly auxiliary boiler operation emissions are estimated based on full load operation, and the daily emission are based on continuous operation for 24 hours. The hourly diesel fired emergency firewater pump emissions are estimated based on 60 minutes of continuous operation. The daily emission rates are based on non-emergency use of one hour per day. Maximum WSAC emissions are estimated from the maximum cooling water total dissolved solids (TDS). For the hourly emissions, TDS concentration is assumed to be 1,100 ppm, 5 cycles of concentration, and a design cooling water recirculation rate of 305 gallons per minute with a 0.005 percent efficient drift eliminator. The WSAC emissions are based on continuous maximum operation for hourly and daily emissions. The project owner's maximum operating hourly and daily emission estimates under simple-cycle and combined-cycle operation are provided in **AIR QUALITY Table 13** and **14**.

AIR QUALITY Table 13
GWF Henrietta Facility Maximum Simple-cycle Emissions

Maximum Hourly Emissions, lbs/hr (excluding start-ups and shutdowns)					
	NOx	CO	VOC	SO_2	PM10/PM2.5
Turbine (Both Turbines)	8.5	6.2	2.4	0.66	4.4
Auxiliary Boiler	0.31	1.6	0.21	0.029	0.32
WSAC	--	--	--	--	0.0084
Existing Emergency Generator	4.9	0.12	0.04	0.005	0.03
Emergency Fire Pump	2.7	0.68	0.09	0.005	0.08
Total Project (lbs/hr)	16.4	8.6	2.7	0.7	4.8
Maximum Daily Emissions, lbs/day (including 2 start-ups and 2 shutdowns)					
	NOx	CO	VOC	SO_2	PM10/PM2.5
Turbine (Both Turbines)	260	206	62	16	104
Auxiliary Boiler	7.4	37.3	5.0	0.7	7.7
WSAC	--	--	--	--	0.2
Existing Emergency Generator	4.9	0.12	0.04	0.005	0.03
Emergency Fire Pump	2.7	0.68	0.09	0.005	0.08
Total Project (lbs/day)	275.0	244.1	67.1	16.7	112.0

Source: GWF Energy 2008a

AIR QUALITY Table 14
GWF Henrietta Facility Maximum Combined-cycle Emissions

Maximum Hourly Emissions, lbs/hr (excluding start-ups and shutdowns)					
	NOx	CO	VOC	SO_2	PM10/PM2.5
Turbine (Both Turbines)	6.8	6.2	2.4	0.66	4.4
Auxiliary Boiler	0.31	1.6	0.21	0.029	0.32
WSAC	--	--	--	--	0.0084
Existing Emergency Generator	4.9	0.12	0.04	0.005	0.03
Emergency Fire Pump	2.7	0.68	0.09	0.005	0.08
Total Project (lbs/hr)	14.7	8.6	2.7	0.7	4.8
Maximum Daily Emissions, lbs/day (including 2 start-ups and 2 shutdowns)					
	NOx	CO	VOC	SO_2	PM10/PM2.5
Turbine (Both Turbines)	236	206	60	16	104
Auxiliary Boiler	7.4	37.3	5.0	0.7	7.7
WSAC	--	--	--	--	0.2
Existing Emergency Generator	4.9	0.12	0.04	0.005	0.03
Emergency Fire Pump	2.7	0.68	0.09	0.005	0.08
Total Project (lbs/day)	251.0	244.1	65.1	16.7	112.0

Source: GWF Energy 2008a

The basis for maximum annual emissions is 1,350 hours of normal operation in the simple-cycle mode at 63°F, 6,650 hours of combined-cycle normal operation at 63°F, and 325 start-ups and shutdowns. Annual SO_2 emissions are based on an expected annual fuel sulfur level of 0.25 grains per 100 standard cubic feet of natural gas. The auxiliary boiler assumes 4,000-hour annual operation at full load. Annual WSAC emissions are based on use of water sprays in the WSAC for 850 hours of operation per year. The annual emission rates for the emergency generator engine and emergency fire pump engine are based on non-emergency use of 50 and 100 hours per year, respectively. The project owner's maximum annual operating emission estimates are provided in **AIR QUALITY Table 15**.

AIR QUALITY Table 15
GWF Henrietta Facility Annual Emissions

Maximum Annual Emissions, tons/year					
	NOx	CO	VOC	SO_2	PM10/PM2.5
Turbine (Both Turbines)	36.00	20.71	4.68	2.82	18.66
Auxiliary Boiler	0.61	3.1	0.42	0.06	0.64
WSAC	--	--	--	--	0.0036
Existing Emergency Generator	0.12	0.003	0.001	0.0001	0.001
Emergency Fire Pump	0.14	0.034	0.0045	0.0005	0.004
Total Project (tons/year)	36.9	23.9	5.1	2.9	19.3

Source: GWF Energy 2008a, SJVAPCD 2009b

The operation of the original Henrietta project was found to cause potentially significant air quality impacts by emitting PM10 and precursors to PM10, PM2.5, and ozone. The original staff assessment and Energy Commission decision found that the project owner could fully mitigate these impacts by offsetting the project emissions. This amendment would not change the basic mitigation strategy (GWF Energy 2009a), where the project owner is proposing to use the emission reduction credits that have been already surrendered to offset the project's emissions (including the transfer of NOx ERCs no longer needed for NOx emission reduction due to the reduction in annual permitted NOx emissions) for use as interpollutant offsets for PM10 to meet District offset requirements and for VOC to meet staff recommended California Environmental Quality Act (CEQA)

mitigation. Due to the revisions in the equipment, which also significantly revise the gas turbine emission exhaust parameters, staff has revisited the short- and long-term analysis of operational impacts. Additionally, due to the proposed change to the offset mitigation package the analysis of the proposed offset mitigation was also revisited.

AMENDED PROJECT IMPACTS

DISPERSION MODELING APPROACH

In the original HPP project analysis, the project owner used the U.S.EPA's Industrial Source Complex (ISC) Model, version 00101, to estimate the impacts of the project's criteria pollutants emissions. For the proposed amendment, the impact analysis is prepared using the U.S.EPA-approved AERMOD model, which is now U.S.EPA's guideline model, and meteorological data approved by the SJVAPCD[1]. Additionally, the project owner obtained hourly ozone ambient data from the Hanford-South Irwin monitoring station for 2004 that was used in a more refined NO_2 impact modeling analysis using the Ozone Limiting Method (OLM) option that is available with AERMOD.

The background concentrations used in the dispersion modeling analysis were chosen from the highest ambient concentrations from the most recent 3 years of data (see **AIR QUALITY Table 4** and **5**). The impacts from the amended GWF Henrietta were added to the background concentrations for the evaluation of impacts on ambient air quality as shown in **AIR QUALITY Tables 16, 18,** and **19**.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Analysis of Construction Phase Impacts

For the construction impacts analysis, the emissions were divided into onsite exhaust impacts and fugitive dust impacts. Onsite exhaust emissions were modeled as four separate point sources within the construction zone. PM10 emissions from fugitive dust were modeled as an area source with a release height of 2 meters. The modeling results shown in **AIR QUALITY Table 16** indicate that maximum construction impacts would not exceed the most stringent SO_2, CO, and annual NO_2 standards. However, PM10/PM2.5 and 1-hour NO_2 modeled impacts combined with the background concentration would be potentially significant due to the potentially significant increase to existing PM10/PM2.5 exceedances and the creation of new NO_2 exceedances.

For the construction impacts analysis, the emissions were divided into onsite exhaust impacts and fugitive dust impacts. Onsite exhaust emissions were modeled as four separate point sources within the construction zone. PM10 emissions from fugitive dust were modeled as an area source with a release height of 2.0 meters. The modeling results shown in **AIR QUALITY Table 16** indicate that maximum impacts of construction do not exceed the most stringent SO_2, CO, and annual NO_2 standards. However, PM10/2.5 and 1-hour NO_2 modeled impacts combined with the background concentration are potentially significant due to the potentially significant increase to existing PM10/PM2.5 exceedance and create of new NO_2 exceedance. Construction impacts were modeled very conservatively, assuming steady-state construction and

[1] Meteorological data for 2004 collected from the Hanford monitoring station and processed by SJVAPCD.

worst-case background concentration. OLM method does not account for kinetic limitation in the near-field conversion of NO to NO_2 that are likely to reduce the amount of NO_2 that are likely to reduce the amount of NO_2 that can be formed from NOx emissions in near-field where the model predicts high concentrations. Taking all these factors into consideration, the actual 1-hour NO_2 impacts are expected to be less than predicted impacts, therefore it is unlikely that a violation would be occur.

AIR QUALITY Table 16
Maximum Project Construction Impacts

Pollutant	Averaging Period	Impacts ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO_2	1-hour	269	137.5	406.5	339	120%
	Annual	18.4	22.8	41.2	57	72%
CO	1-hour	233	5,060	5293	23,000	23%
	8-hour	81	3,678	3759	10,000	38%
SO_2	1-hour	0.46	340.6	341.1	665	51%
	3-hour	0.3	195.0	195.3	1,300	15%
	24-hour	0.09	81.4	81.49	105	78%
	Annual	0.02	18.7	18.72	80	23%
PM10	24-hour	57.6	142	199.6	50	399%
	Annual	11.9	46.8	58.7	20	293%
PM2.5	24-hour	7.7	74.5	82.2	35	235%
	Annual	2.3	21.2	23.5	12	196%

Source: GWF Energy 2008a

The project owner has noted that the modeling method they used was conservative for several reasons and that they do not believe the construction would cause a violation of the State 1-hr NO_2 standard. The OLM method used for 1-hour NO_2 determination does not account for ozone reactant or kinetic limitations in the near-field conversion of NO to NO_2 that are likely to reduce the amount of NO_2 that can be formed from NOx emissions in near-field where the model predicts high concentrations. Staff completed a separate modeling analysis to determine the worst case 1-hr NOx impacts. Staff's modeling analysis uses both the hourly background ozone data to determine conservative impacts from the construction impacts and adds them to the corresponding actual hourly background NO_2 concentrations from the Hanford monitoring station to determine a worst-case hourly concentration. This analysis is still conservative as it assumes complete conversion of all of the NO to NO_2 based on complete reaction with the ambient ozone concentration in the very short-time frame that the emission plume reaches the fence line. The results of this analysis are provided in **AIR QUALITY Table 17**.

AIR QUALITY Table 17
Maximum Project Construction 1-hr NO_2 Impacts

Pollutant	Averaging Period	Impacts ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO_2	1-hour	261.6	54.6	316.2	339	93%

Source: Staff analysis

As shown in **AIR QUALITY Table 17** the expected worst-case construction related 1-hour NO_2 impact was found to be below the California AAQS. The maximum impact was determined to occur at the western fence line.

The project area is designated nonattainment area for PM10/2.5, and the selected background concentrations exceed the current PM10/2.5 standards. In order to minimize the construction impacts of PM10/2.5 and NO_2, best available control measures would be used throughout the 15-month construction period.

Construction Mitigation

Project Owner's Proposed Mitigation

The project owner proposes to implement previous construction mitigation measures outlined in the HPP COCs.

Staff Proposed Mitigation

Staff agrees with the project owner's proposed mitigation measures. However, because of the predicted significant contribution to both the short- and long-term PM10 and PM2.5 problems, staff believes some additional construction mitigation measures are necessary.

Staff recommends construction PM10 and NOx emission mitigation measures as articulated in Conditions of Certification **AQ-SC1** through **AQ-SC5** that include modified versions of similar conditions proposed by the project owner in the Amendment Petition that bring these mitigation measures up to the current staff recommendations.

Staff recommends **AQ-SC1** to require the project owner to have an on-site construction mitigation manager who would be responsible for the implementation and compliance of the construction mitigation program. The documentation of the ongoing implementation and compliance with the construction mitigation program would be provided in the monthly construction compliance report that is required in staff's recommended Condition of Certification **AQ-SC2**. Recommended Condition of Certification **AQ-SC3** formalizes the fugitive dust control requirements. Recommended Condition of Certification **AQ-SC4** would limit the potential offsite impacts from visible dust emissions, to respond to situations when the control measures required by **AQ-SC3** are not working effectively to control fugitive dust from leaving the construction site area.

Staff recommends Condition of Certification **AQ-SC5** to mitigate the PM and NOx emissions from the large diesel-fueled construction equipment. Implementation of this mitigation measure would provide additional primary and secondary PM mitigation to supplement the recommended fugitive dust mitigation measures. This condition requires the use of U.S.EPA/ARB Tier 2 engine compliant equipment for equipment over 100 hp where available, a good faith effort to find and use available U.S.EPA/ARB Tier 3 engine compliant equipment over 100 hp, and also includes equipment idle time restrictions and engine maintenance provisions. The Tier 2 standards include engine emission standards for NOx plus non-methane hydrocarbons, CO, and PM emissions; while the Tier 3 standards further reduce the NOx plus non-methane hydrocarbons emissions. The Tier 2 and Tier 3 standards became effective for engine/equipment model years 2001 to 2003 and models years 2006 to 2007, respectively, for engines between 100 and 750 hp.

Analysis of Commissioning Phase Impacts

The project owner estimated commissioning impacts based on the maximum emission rates for each operating load and turbine configuration. The annual commissioning

impacts are not provided since commissioning activities are only expected to last for 65 days. The project owner did not include the auxiliary boiler, diesel-fueled engines, and WSAC emissions as part of the turbine commissioning impacts analysis. Maximum impacts for SO_2, PM10 and PM2.5 are expected to be equal to or less than normal operational impacts due to reduced loads and fuel input during the commission period. The modeled commissioning impacts for NO_2 and CO in **AIR QUALITY Table 18** show that the total impacts would be well below the ambient air quality standards, therefore, impacts from commissioning would be less than significant.

AIR QUALITY Table 18
Initial Commissioning Impacts Analysis

Pollutant	Averaging Time	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Percent of Standard
NO_2	1-hour	57	137.5	194.5	339	57%
CO	1-hour	52	5,060	5112	23,000	22%
	8-hour	32	3,678	3710	10,000	37%

Source: GWF Energy 2008a

The impacts associated with the proposed revisions to the commissioning activities would be greater than those presented for Henrietta in the original analysis, but as with the original analysis, no significant impacts would occur. The commissioning emissions would be counted toward the annual emission limits for the facility, thus there is an incentive for the project owner to limit the commissioning emissions to the lowest possible levels.

Analysis of Operating Phase Impacts

In order to evaluate the maximum operating impacts, a modeling analysis was conducted at base and 60 percent loads at the design-high (115°F), low (15°F), and weighted annual average ambient temperature (63°F). The emission rates provided in **AIR QUALITY Tables 13** through **15** were used in operational modeling analysis.

AIR QUALITY Table 19
Maximum Project Operating Impacts

Pollutant	Averaging Period	Impacts ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Percent of Standard
NO_2	1-hour	201.4	137.5	338.9	339	100%
	Annual	2.3	22.8	25.1	57	44%
CO	1-hour	127	5,060	5187	23,000	23%
	8-hour	87	3,678	3765	10,000	38%
SO_2	1-hour	1.9	340.6	342.5	665	52%
	3-hour	1.3	195.0	196.3	1,300	15%
	24-hour	0.91	81.4	82.3	105	78%
	Annual	0.17	18.7	18.9	80	24%
PM10	24-hour	11.6	142	153.6	50	307%
	Annual	2.0	46.8	48.8	20	244%
PM2.5	24-hour	11.6	74.5	86.1	35	246%
	Annual	2.0	21.2	23.2	12	193%

Source: GWF Energy 2008a

The NO_2, SO_2, and CO concentrations combined with the background concentrations do not exceed the most stringent standards. The NO_2 impacts determined by the project

owner's NOx_OLM modeling analysis are primarily driven by the emergency engine and fire pump engine. The maximum 1-hour NO_2 impacts determined from the gas turbines alone would be less than 21 µg/m^3 and from the auxiliary boiler alone would be less than 22 µg/m^3. Additionally, using actual hourly NO_2 background concentration data rather than using the worst-case background concentration would result in lower total project impacts than shown in the table. Therefore, staff believes that no exceedances of the 1-hour NO_2 AAQS would occur as a result of the normal operation of the facility. However, the NO_2 and VOC emissions if unmitigated could contribute to ozone exceedance.

The maximum 24-hour PM10 and PM2.5 impacts shown in the table are fence line impacts (southeast fence line) and are driven by the modeled auxiliary boiler and the fire pump engine emissions (over 95 percent of the total impact). It is unlikely that these two devices would actually operate for 24 hours a day very often, in the case of the boiler, or ever in the case of the fire pump engine. Additionally, it is generally considered appropriate to use the 98th percentile impact for the 24-hour PM2.5 modeling result basis, since the basis of the NAAQS is the 98th percentile value, while the project owner provided and the table shows the maximum 24-hour impact. Therefore, staff feels that the modeled PM10 and PM2.5 24-hour impacts are overstated The selected PM10 and PM2.5 background concentrations exceed the standard without adding the operational impacts. Therefore, PM10/2.5 emissions, if unmitigated, would further contribute to existing exceedances and would be potentially significant. GWF Henrietta is proposing to fully offset all project emissions.

Chemically Reactive Pollutant Impacts

Ozone Impacts

The project's gaseous emissions of NOx, SO_2, VOC and ammonia can contribute to the formation of secondary pollutants: ozone and PM10/PM2.5.

There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, it can be said that the emissions of NOx and VOC from the GWF Henrietta project do have the potential (if left unmitigated) to contribute to higher ozone levels in the region. These impacts would be cumulatively significant because they would contribute to ongoing violations of the state and federal ozone ambient air quality standards.

PM2.5 Impacts

Secondary PM10 formation, which is assumed to be 100 percent PM2.5, is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion, which occurs downwind from the point of emission, is complex and depends on many factors, including local humidity and the presence of air pollutants. The basic process assumes that the SOx and NOx emissions are converted into sulfuric acid and nitric acid first, and then react with ambient ammonia to form sulfate and nitrate. The sulfuric acid reacts with ammonia much faster than nitric acid and converts completely and irreversibly to particulate form. Nitric acid reacts with ammonia to form both a particulate and a gas phase of ammonium nitrate. The

particulate phase will tend to fall out, however the gas phase can revert back to ammonia and nitric acid. Thus, under the right conditions, ammonium nitrate and nitric acid establish a balance of concentrations in the ambient air. There are two conditions that are of interest, described as “ammonia rich” and “ammonia poor.” The term “ammonia rich” indicates that there is more than enough ammonia to react with all the sulfuric acid and to establish a balance of nitric acid-ammonium nitrate. Further ammonia emissions in this case will not necessarily lead to significantly increased ambient PM2.5 concentrations. In the case of an “ammonia poor” environment, there is insufficient ammonia to establish a balance and thus additional ammonia will tend to increase PM2.5 concentrations.

The San Joaquin Valley has been the subject of an extensive secondary particulate formation study, the California Regional Particulate Air Quality Study, which has determined that the San Joaquin Valley is ammonia rich. Therefore, the ammonia emissions from the GWF Henrietta project are not expected to lead to substantial further formation of ammonium nitrate or sulfate. While there will certainly be some conversion from the ammonia emitted from the GWF Henrietta project, there is currently no regulatory model that can predict the conversion rate. However, because of the known relationship of NOx and SOx emissions to PM2.5 formation, it can be said that the emissions of NOx and SOx from the GWF Henrietta project do have the potential (if left unmitigated) to contribute to higher PM2.5 levels in the region.

The project owner is proposing to fully mitigate the project’s NOx, VOC, SO_2, and PM10 emissions through the use of emission offsets and limit the ammonia slip emissions to 5 ppm when operating in combined-cycle mode and 10 ppm when operating in simple-cycle mode. NOx, VOC, SO_2, and PM10 are proposed to be offset by the project owner at a greater than 1:1 ratio. With the proposed emission offsets, it is staff’s belief that the project would not cause significant secondary pollutant impacts.

Operations Mitigation

Project Owner’s Proposed Mitigation

Emission Controls

As discussed in the air quality section of the amendment petition (GWF Energy 2008a), the project owner proposes the following emission controls on the stationary equipment associated with operation of GWF Henrietta:

Turbines

The project owner’s proposed Best Available Control Technology (BACT) for the two 95MW turbines would include water injected low NOx combustors and SCR (for NOx), good combustion practices and an oxidation catalyst (for CO), and operate exclusively on pipeline quality natural gas (for VOC, PM and SOx) to limit emission levels. The amendment petition (GWF Energy 2008a) and FDOC conditions (SJVAPCD 2009b) provides the following BACT emission limits, each for the two CTGs:

NOx: 2.5 ppmvd at 15 percent O_2 in simple-cycle mode, 2.0 ppmvd at 15 percent O_2 in combined-cycle mode, or 4.2 lbs/hour for simple-cycle mode and 3.4 lbs/hour for combined-cycle mode (1-hour average)

CO: 3.0 ppmvd at 15 percent O_2, 3.1 lbs/hour both modes (3-hour average),

VOC: 2.0 ppmvd at 15 percent O_2, 1.2 lbs/hour for both modes (3-hour average)

PM10/PM2.5: 2.20 lbs/hour

SO_2: 0.33 lbs/hour, based on fuel sulfur content of 0.25 grains/100 scf

NH_3: 10.0 ppmvd (6.2 lbs/hour) in simple-cycle mode and 5.0 ppmvd (3.1 lbs/hour) or less at 15 percent O_2 in combined-cycle mode. (24-hour rolling average)

Auxiliary Boiler

The auxiliary boiler would be equipped with an ultra low-NOx burner (for NOx), good combustion practices (for CO), and operate exclusively on pipeline quality natural gas (for VOC, PM and SOx) to limit emission levels as follows:

NOx: 6.0ppmvd at 3% O_2, or 0.0073 lbs/MMBtu, 0.306 lbs/hour

CO: 50.0ppmvd at 3% O_2, or 0.037 lbs/MMBtu, 1.553 lbs/hour

VOC: 0.005 lbs/MMBtu, 0.210 lbs/hour

PM10/PM2.5: 0.01 lbs/MMBtu, 0.294 lbs/hour

SO_2: 0.01 lbs/MMBtu, 0.0225 lbs/hour

Wet Surface Air Cooler (WSAC)

Drift rate, percent of recirculation rate: 0.005 percent, using a mist eliminator

PM10/PM2.5: 0.0084 lbs/hour (24-hour average)

Existing Emergency Generator Engine

The existing 471 bhp emergency generator engine is equipped with positive crankcase ventilation (PCV), 90 percent efficient crankcase emission control device, turbocharger, intercooler/aftercooler, and automatic air/fuel ratio or O_2 controller.

NOx: 4.69 grams/bhp-hour, 4.87 lbs/hour

CO: 0.12 grams/bhp-hour, 0.12 lbs/hour

VOC: 0.04 grams/bhp-hour, 0.042 lbs/hour

PM10/PM2.5: 0.029 grams/bhp-hour, 0.03 lbs/hour

SO_2: 0.0051 grams/bhp-hour, 0.005 lbs/hour

Emergency Firewater Pump Engine

The proposed emergency firewater pump engine would be 460bhp, Tier III engine, equipped with positive crankcase ventilation (PCV), 90 percent efficient crankcase emission control device, turbocharger, intercooler/aftercooler, and automatic air/fuel ratio or O_2 controller.

NOx: 2.66 grams/bhp-hour, 2.698 lbs/hour

CO: 0.671 grams/bhp-hour, 0.68 lbs/hour

VOC: 0.086 grams/bhp-hour, 0.09 lbs/hour

PM10/PM2.5: 0.078 grams/bhp-hour, 0.079 lbs/hour

SO_2: 0.0051 grams/bhp-hour, 0.0052 lbs/hour

Emission Offsets

The project owner is only required by District regulations to offset the difference between the proposed-post project potential to emit and the current permitted emission levels for NOx and PM10, since the other pollutants do not trigger District offset requirements. However, the original HPP was fully offset to meet both District regulations and staff recommended CEQA mitigation (1:1 minimum offset ratio for all nonattainment pollutants and precursors). In fact, the project owner surrendered enough credits to meet a 1.5:1 minimum offset ratio for all pollutants regardless of the District offset requirements.

All criteria pollutants emissions for the amended project would be increased with the exception of NOx. In order to offset the potential incremental PM10 emissions, 6,607 lbs, the project owner is proposing to provide 15,725 lbs of surplus NOx mitigation at 2.38:1 ratio. The District, in their FDOC, has accepted the general philosophy of applying the reduction in necessary NOx offsets for PM10 (interpollutant netting), that they have determined to be consistent with Rule 2201 requirements (SJVAPCD 2009b). However, the District has but has determined that an interpollutant ratio of 2.629:1 is appropriate for the site location. The District has also provided staff information that an interpollutant offset ratio of 1:1 would currently be considered appropriate for SOx for PM10 and NOx for VOC.

AIR QUALITY Table 20
GWF Henrietta Mitigation Summary (lbs)

	NOx	CO	VOC	PM10/2.5	SO_2
Post Project Potential to Emit	73,735	47,700	10,217	38,607	5,757
Current Permitted Emissions Level (2 Turbines)	99,994	43,685	5,696	32,006	5,281
Project Emissions Change	-26,259	4,015	4,521	6,601	476

Source: GWF Energy 2008a, SJVAPCD 2009b

The VOC emissions increase is disproportionately high, in terms of percentage increase, due in nearly equal measure to an increase in the assumed average hourly emission factor (0.5 lb/hour versus 0.33 lbs/hour) and an increase in the assumed startup/shutdown cycle VOC emissions.

The project owner surrendered enough emissions reduction credits for the HPP project to offset the current GWF Henrietta project emissions to meet both District requirements and staff recommended CEQA mitigation. Staff's offset accounting analysis is provided below in **AIR QUALITY Tables 21** through **24**. For the purposes of this accounting analysis the greater of the District rule requirement or staff recommended CEQA mitigation is used where the District requirement is the greatest for NOx and staff's recommended CEQA mitigation is the greatest for PM, VOC, and SOx mitigation.

The NOx ERCs are all more than 15 miles from the project site, so a District distance ratio of 1.5:1 applies.

AIR QUALITY Table 21
NOx Offsets for GWF Henrietta

Offset Source Location	Credit Number	Total Q1 (lbs)	Total Q2 (lbs)	Total Q3 (lbs)	Total Q4 (lbs)
525 W. Third St., Hanford	C-410-2	22,510	0.0	0.0	5,708
525 W. Third St., Hanford	C-411-2	5,205	4,562	4,562	7,991
525 W. Third St., Hanford	C-412-2	0.0	0.0	0.0	1,915
Elk Hills Sec.:35 Township: 30S Range:23 E	S-1615-2	20,012	39,890	40,329	40,329
Total ERC Holdings		47,727	44,452	44,891	55,943
GWF Henrietta NOx emissions [a]		18,182	18,383	18,585	18,585
SJVAPCD Offset Threshold		5,000	5,000	5,000	5,000
Emissions minus Threshold		13,182	13,383	13,585	13,585
Total District Required @ 1.5:1		19,773	20,075	20,378	20,378
ERC's not surrendered remaining on Certificate [b]	S-1615-2	18,672	14,242	14,681	26,888
Surplus (Total ERC Holdings – Total Required – Not Surrendered)		9,282	10,136	9,833	8,678

Sources: GWF Energy 2009a, GWF Energy 2009b, SJVAPCD 2009b, staff analysis.
[a] Emissions were distributed equally by the number of days in the quarter for a 365 day year.
[b] Per project owner's information (GWF 2009b)

The SOx emissions are not required to be offset under District rules and are evaluated using a staff recommended CEQA mitigation offset ratio of 1:1. The project owner, at its own discretion, provided SOx ERCs at a 1.5:1 offset ratio for the HPP. As **AIR QUALITY Table 22** shows using a 1:1 offset ratio the project owner has surrendered more SOx ERCs than necessary under staff's CEQA mitigation recommendation.

AIR QUALITY Table 22
SO_2 Offsets Available for GWF Henrietta

Offset Source Location	Credit Number	Total Q1 (lbs)	Total Q2 (lbs)	Total Q3 (lbs)	Total Q4 (lbs)
525 W. Third St., Hanford (from Table 24)	C-413-5	10,000	4,386	1,098	9,372
525 W. Third St., Hanford	C-392-5	2,500	2,500	2,500	2,500
Total ERC Holdings		12,500	6,886	3,598	11,872
GWF Henrietta Permitted SO_2 emissions [a]		1,420	1,435	1,451	1,451
ERC's not surrendered remaining on Certificate [b]	C-413-5	8,020.0	2,406.0	0.0	7,392.1
ERC's not surrendered remaining on Certificate [b]	C-392-5	2,500.0	2,500.0	1,176.8	2,500.0
Surplus per 1:1 staff recommendation (Total ERC Holdings – emissions – Not Surrendered)		560	545	970	529

Sources: GWF Energy 2009a, GWF Energy 2009b, SJVAPCD 2009b, staff analysis.
[a] Emissions were distributed equally by the number of days in the quarter for a 365 day year.
[b] Per project owner's information (GWF 2009b)

The VOC emissions are not required to be offset under District rules and are evaluated using a staff recommended CEQA mitigation offset ratio of 1:1. The project owner, at their own discretion, provided VOC ERCs at a 1.5:1 offset ratio for the HPP. Due to the increase in assumed emissions the project owner has proposed to meet staff's recommended CEQA mitigation by applying the surplus NOx credits (as shown in **AIR QUALITY Table 21**).

AIR QUALITY Table 23
VOC Offsets Available for GWF Henrietta

Offset Source Location	Credit Number	Total Q1 (lbs)	Total Q2 (lbs)	Total Q3 (lbs)	Total Q4 (lbs)
20807 Stockdale HWY, Bakersfield	S-1673-1	2,728	2,626	2,626	2,728
GWF Henrietta Permitted VOC emissions [a]		2,520	2,547	2,575	2,575
ERC's not surrendered remaining on Certificate [b]	S-1673-1	646	439	439	646
Final Surplus		-438	-360	-388	-493
NOx Surplus ERCs from Table 21		9,282	10,136	9,833	8,678
NOx for VOC @ 1:1 ratio		438	360	388	493
Remaining NOx Surplus Surrendered ERCs		8,844	9,776	9,445	8,185

Sources: GWF Energy 2009a, GWF Energy 2009b, SJVAPCD 2009b, staff analysis
[a] Emissions were distributed equally by the number of days in the quarter for a 365 day year.
[b] Per project owner's information (GWF 2009b)

PM10 emissions were originally offset using a SOx for PM10 interpollutant trade that assumed an interpollutant trading ratio of 1.4:1 and an additive distance ratio of 1.5:1 for a total ratio of 1.9:1. The amount of ERCs provided met staff's recommended CEQA mitigation, so the original amount of ERCs surrendered were well above the District offset requirements considering the District's offset threshold of 29,200 lbs/year.

AIR QUALITY Table 24
PM10 Offsets Available for GWF Henrietta

Offset Source Location	Credit Number	Total Q1 (lbs)	Total Q2 (lbs)	Total Q3 (lbs)	Total Q4 (lbs)
525 W. Third St., Hanford	C-445-5	21,101	10,814	6,298	14,572
525 W. Third St., Hanford	C-413-5	10,000	10,000	10,000	10,000
Total ERC Holdings		31,101	20,814	16,298	24,572
GWF Henrietta Permitted PM10 emissions [a]		9,522	9,627	9,733	9,733
ERC's not surrendered remaining on Certificate [b]	C-445-5	5,901	0.0	0.0	0.0
ERC's not surrendered remaining on Certificate [b]	C-413-5	10,000	4,386	1,098	9,372
Remaining SOx Surplus Surrendered ERCs per 1:1 staff recommendation (Total ERC Holdings – emissions – Not Surrendered)		5,678	6,801	5,467	5,467

Sources: GWF Energy 2009a, GWF Energy 2009b, SJVAPCD 2009b
[a] Emissions were distributed equally by the number of days in the quarter for a 365 day year.
[b] Per project owner's information (GWF 2009b)

As **AIR QUALITY Tables 21** through **24** shows, the total amount of surrendered NOx and SOx ERCs (91,341 lbs) is well above District and staff's recommended minimum offset requirements. The project owner originally surrendered considerably more ERCs than required by the District and considerably more than staff's CEQA minimum mitigation recommendation. The total surplus of surrendered NOx and SOx ERCs based the higher of the District required offsets or staff recommended offsets would be 36,250 pounds and 26,017 pounds, respectively. Therefore, the generous amount of ERCs previously surrendered by the project owner are considered more than sufficient to offset the amended project considering the large decrease in permitted NOx emissions versus the smaller increases in PM10, VOC, and SOx emissions, and would accommodate very large increases to the recommended interpollutant offset ratios (NOx for VOC and SOx for PM10, both at 1:1).

The District's accounting in the FDOC was somewhat different as they didn't consider the previous CEQA based SOx ERC mitigation provided by the applicant. The District

instead moved the NOx ERCs no longer needed to offset the NOx emissions to cover the increase in PM10 emissions at a ratio of 2.629:1. The VOC and SOx emissions for the amended project remain below the District offset thresholds. Using this different offset accounting procedure the District also found that the previously surrendered ERCs were sufficient to offset the amended project. Attachment P of the FDOC discusses that U.S. EPA had a comment about the Districts PM10 interpollutant offset proposal and indicates that the District and U.S. EPA have agreed to the procedures necessary to use the NOx credits for PM10 offset purposes.

Summary of Staff Changes to Mitigation

Staff recommends Conditions of Certification **AQ-SC6** for compliance demonstration of control technology and estimation of PM10/PM2.5 emissions for the WSAC that is not included in the District permits.

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 analysis is primarily concerned with "criteria" air pollutants. Such pollutants have impacts that are usually (though not always) cumulative by nature. Rarely will a project cause a violation of a federal or state criteria pollutant standard. However, a new source of pollution may contribute to violations of criteria pollutant standards because of the existing background sources or foreseeable future projects. Air districts attempt to attain the criteria pollutant standards by adopting attainment plans, which comprise a multi-faceted programmatic approach to such attainment. Depending on the air district, these plans typically include requirements for air offsets and the use of Best Available Control Technology for new sources of emissions, and restrictions of emissions from existing sources of air pollution.

Much of the discussion in this analysis is concerned with cumulative impacts. The "Criteria Pollutant Air Quality Data" section describes the air quality background in the SJVAB, including a discussion of historic ambient levels for each of the significant criteria pollutants. The "Analysis of Construction Activities Impacts" section discusses the project's contribution to the local existing background caused by project construction. The "Analysis of Operating Phase Impacts" section discusses the project's contribution to the local existing background caused by project operation. The Cumulative Impacts section includes three additional analyses:

- a summary of projections for criteria pollutants by the air district and the air district's programmatic efforts to abate such pollution;
- an analysis of the project's "localized cumulative impacts", the project's direct operating emissions combined with other local major emission sources; and

- a discussion of greenhouse gas emissions and global climate change impacts (provided in **AIR QUALITY Appendix AIR-1**)

Summary of Projections

The federal and California Clean Air Acts direct local air quality management agencies to implement plans and programs that lead to attainment and maintenance of the ambient air quality standards. The New Source Review program administered by SJVAPCD and other programs for reducing emissions from mobile sources or areawide sources, are part of air quality management plans.

Ozone

- The **2004 Extreme Ozone Attainment Demonstration Plan** illustrates how the SJVAPCD would attain the federal 1-hour ozone standard that was revoked in 2005. The U.S.EPA proposed approval of the SJVAPCD 2004 Ozone Plan on October 16, 2008 (73 FR 61381). This plan shows how the area would achieve the revoked 1-hour ozone standard in 2010, and it includes elements that are the foundation for later ozone plans.

- The **2007 Ozone Plan** to attain the federal 8-hour ozone standard was approved by ARB on June 14, 2007. This plan would reduce ozone and particulate matter levels in the region, primarily by achieving a 75 percent reduction in NOx emissions by 2023. Achieving such dramatic reductions would affect all sectors of the region's economy. The plan relies on four main approaches: tighter district regulations for stationary sources, wider use of incentive-based measures (like the Carl Moyer Program) to accelerate deployment of cleaner sources, new "innovative" programs for trip-reduction and energy conservation, and expanded controls on mobile source tailpipe emissions.

The GWF Henrietta project is subject to the current SJVAPCD rules and regulations that specify performance standards, offset requirements, and emission control requirements for stationary sources. The regulations also include requirements for obtaining Authority to Construct (ATC) permits and subsequent operating permits. These regulations apply to GWF Henrietta and all other projects with emission sources. In general, triennial updates of the attainment plans ensure that population, employment, and transportation trends in the region are taken into account, and compliance with SJVAPCD rules and regulations ensures consistency with the regional air quality management plans.

Particulate Matter

- The **2007 PM10 Maintenance Plan** illustrates how the SJVAPCD intends to continue the efforts of the 2003 PM10 Plan and 2006 PM10 Plan that implemented aggressive PM10 controls in the region, including Reasonably Available Control Measures (RACM) for large existing sources of PM10 and fugitive dust. The 2007 PM10 Maintenance Plan includes a request for reclassification to "attainment" for the federal PM10 standard, and it provides for continued attainment for 10 years from the designation. In November 2008, the U.S.EPA redesignated the SJVAPCD to attainment for the federal PM10 standard (73 FR 66759, November 12, 2008).

- The **2008 PM2.5 Plan** was adopted by the SJVAPCD Governing Board on April 30, 2008, and it includes measures for attaining the 1997 and 2006 federal PM2.5 standards. The 2008 PM2.5 Plan shows that emission reductions of NOx, directly emitted PM2.5, and SO_2 are needed to demonstrate attainment of the PM2.5 NAAQS in the San Joaquin Valley (p. 6-1 of plan).

Energy Commission staff is concerned that the GWF Henrietta project could interfere with the attainment effort of the 2008 PM2.5 Plan as it has relied on SOx emission reduction credits without an adequate interpollutant trading ratio for allowing PM2.5 increases. The "reasonable further progress" calculations in the 2008 PM2.5 Plan shows that about 10 times more tons of direct PM2.5 need to be reduced than SO_2 (Table 8-2 of 2008 PM2.5 Plan). The 2014 Receptor Modeling Documentation supporting the 2008 PM2.5 Plan indicates that reducing SOx would not be as effective as reducing direct PM2.5 or NOx. Interpollutant trading is allowed with "the appropriate scientific demonstration of an adequate trading ratio" (Rule 2201, Section 4.13), and the SJVAPCD 2007 PM10 Maintenance Plan (see Appendix E of the Maintenance Plan) indicates that the minimum ratio would be one-to-one with higher interpollutant ratios if appropriate under Rule 2201.

The proposed GWF Henrietta would increase the existing potential to emit for PM10 or PM2.5. However, the project owner originally surrendered considerably more ERCs for the HPP than necessary to meet District rules or staff CEQA mitigation recommendations. The project owner, after subtracting District required NOx ERCs and staff recommended NOx for VOC ERCs and SOx ERCs (both at a 1:1 ratio), has surrendered an additional total of 36,250 pounds of NOx ERCs and 64,632 pounds of SOx ERCs that can be applied to offset the 38,615 pounds of particulate emissions proposed by this amendment. Additionally, unlike other current siting projects GWF Henrietta surrendered all of the SOx ERCs and a portion of the NOx ERCs from a relatively nearby reduction source located in Hanford. Additionally, the District and U.S. EPA have agreed to the necessary District-wide Rule 2201 offset accounting procedures necessary to use the excess NOx ERCs for PM10 offsetting. Therefore, staff believes that the project would comply with the particulate matter plans by meeting its permit requirements and complying with the existing applicable rules and regulations.

Carbon Monoxide

The **Carbon Monoxide Maintenance Plan** applies to 10 separate urbanized areas including the Fresno urbanized area. The project site itself is approximately 30 miles south of the Fresno urbanized area; therefore, the plan does not strictly apply to the project area. The project's construction and operation were not found to cause any new exceedances of the CO AAQS. The project's generated traffic would be insignificant in comparison with the existing Lemoore NAS area traffic and the project's primary emission sources normally emit CO concentrations out of the stack that are below the ambient air quality standards. Therefore, the project would not adversely affect the Carbon Monoxide Maintenance Plan.

Localized Cumulative Impacts

Since the power plant air quality impacts can be reasonably estimated through air dispersion modeling the project contributions to localized cumulative impacts can be

estimated. To represent “past” and, to an extent, “present projects” that contribute to ambient air quality conditions, the Commission staff recommends the use of ambient air quality monitoring data, referred to as the “background”. The staff undertakes the following steps to identify appropriate “present projects” that are not represented in the background and “reasonably foreseeable projects”:

First, Energy Commission staff (or the project owner) works with the air district to identify all projects within 6 miles of the project site that have submitted, within the last year of monitoring data, new applications for an ATC or permit to operate (PTO) and applications to modify an existing PTO. Based on staff’s modeling experience, beyond 6 miles there is no statistically significant concentration overlap for non-reactive pollutant concentrations between two stationary emission sources.

Second, Energy Commission staff (or the project owner) works with the air district and local counties to identify any new area sources within six miles of the project site. As opposed to point sources, area sources include sources like agricultural fields, residential developments or other such sources that do not have a distinct point of emission. New area sources are typically identified through draft or final Environmental Impact Reports (EIR) that are prepared for those sources. The initiation of the EIR process is a reasonable basis on which to determine what is “reasonably foreseeable” for new area sources.

The data submitted, or generated from the applications with the air district for point sources or from the EIR process for area sources provides enough information to include these new emission sources in air dispersion modeling. Thus, the next step is to review the available EIR(s) and permit application(s), and then determine what sources must be modeled and how they must be modeled.

Sources that are not new, but may not be represented in ambient air quality monitoring are also identified and included in the analysis. These sources include existing sources that are co-located with or adjacent to the proposed source (such as an existing power plant). In most cases, the ambient air quality measurements are not recorded close to the proposed project, thus a local major source might not be well represented by the background air monitoring. When these sources are included, it is typically a result of there being an existing source on the project site and the ambient air quality monitoring station being more than 2 miles away.

The modeling results must be carefully interpreted so that they are not skewed towards a single source, in high impact areas near that source’s fence line. It is not truly a cumulative impact of the GWF Henrietta project if the high impact area is the result of high fence line concentrations from another stationary source and GWF Henrietta is not providing a substantial contribution to the determined high impact area.

The project owner initially reviewed 25 facilities that have requested or received approximately 40 ATC permits within 6 miles of GWF Henrietta, provided by SJVAPCD. Many of the sources are eliminated from a cumulative impact analysis because they are either: VOC-only emission sources, equipment shutdowns, or other permitting actions resulting in no net increase in air emissions. Remaining sources listed in **AIR QUALITY Table 25** either had no emission increase or the annual emission increases would be less than 2 tons per year of NOx, CO, SOx, PM10 and PM2.5, which would be less than significant. Since the cumulative sources within 6 miles of the project site would be less

than significant, a cumulative dispersion modeling analysis is not required and cumulative air quality impacts are considered less than significant.

AIR QUALITY Table 25
SJVAPCD Sources within a 6-mile radius

Facility	Description	Emissions information
Central Valley Cabinet Mfg.	New dust collector	Increase ≤ 0.5 tons-PM10/year
Island Cooperative Gin Inc	Modify gin emission limits	No emissions increase
SK Foods Inc	Install a seasonal 99.9 MMBtu/hr boiler	Increase < 0.8 tons/year for: NOx, CO, PM10 and SOx
SK Foods Inc	Modify boiler and engine	Increase < 1.5 tons/year for: NOx, CO, PM10 and SOx
City of Lemoore	Internal combustion engine (ICE)	No emissions increase, modification of 2 emergency IC engine to comply with Rule 4702
Verizon Wireless – Lemoore	Tier 3 diesel ICE	Increase < 10 lbs/year increase in NOx and CO emissions
Leprino Foods Company	Install lactose permeate dryer system	Increase ≤ 2.0 tons-PM10/year
Leprino Foods Company	Expansion of cheese manufacturing operations	Emissions undefined (project in progress, not yet finalized)
Leprino Foods Company	Modify boiler units 1, 2 and 3, for common heat exchanger	No emissions increase
Leprino Foods Company	Reinstate LPG as backup for boilers 1, 2, 3, dryer 4	Increase < 0.2 tons/year SOx
HG Foods LCC	Charbroiler	Increase < 0.3 tons/year for: NOx and PM10
BK Sydran Ventures	Charbroiler	No emissions increase, replaced by next project below
BK Sydran Ventures	Increase throughput	Increase < 0.1 tons/year for: NOx and PM10
Associated Soils Analysis, Inc	Soil remediation with electric cat oxidizer	VOC source

Source: GWF Energy 2009a

COMPLIANCE WITH LORS

The SJVAPCD issued a PDOC for the GWF Henrietta project on April 15, 2009 (SJVAPCD 2009a) and an FDOC on August 4, 2009 (SJVAPCD 2009b). Compliance with all District Rules and Regulations was demonstrated to the District's satisfaction in the FDOC. The District's FDOC conditions are presented in the Conditions of Certification.

FEDERAL

The District is responsible for issuing the Federal New Source Review (NSR) permit. This project will not require a Prevention of Significant Deterioration (PSD) permit from U.S.EPA prior to initiating construction.

STATE

The project owner will demonstrate that the project will comply with Section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury, with the issuance of the District's FDOC and the Energy Commission's affirmative finding for the amended project.

LOCAL

The District has issued an FDOC (SJVAPCD 2009b) stating that the proposed project is expected to comply with all applicable District rules and regulations. The District rules and regulations specify the emissions control and offset requirements for new sources such as the GWF Henrietta project. BACT would be implemented, and ERCs, proposed by the Project owner and approved and certified by the District, would fully mitigate project nonattainment pollutant (including precursors) emissions so that they would be consistent with the strategies and future emissions anticipated under the Districts air quality attainment and maintenance plans.

As part of the Energy Commission's licensing process, in lieu of issuing a construction permit to the project owner for the GWF Henrietta project, the District will prepare and present to the Commission a Determination of Compliance (DOC), both a PDOC, and after a public comment period, an FDOC. The PDOC was published on April 15, 2009, and the FDOC was published on August 4, 2009. The DOC evaluates whether and under what conditions the proposed project will comply with the District's applicable rules and regulations, as described below.

Regulation I – General Provisions

Rule 1080 – Stack Monitoring

This rule grants the Air Pollution Control Officer the authority to request the installation and use of continuous emissions monitors (CEMs), and specifies performance standards for the equipment and administrative requirements for record keeping, reporting, and notification. The FDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 1081 – Source Sampling

This rule requires adequate and safe facilities for use in sampling to determine compliance with emission limits, and specifies methods and procedures for source testing and sample collection. The FDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 1100 – Equipment Breakdown

This rule defines a breakdown condition, the procedures to follow if one occurs, and the requirements for corrective action, issuance of an emergency variance, and reporting. This rule is applied to the owner of any source operation with air pollution control equipment, or related operating equipment that controls air emissions, or continuous monitoring equipment. The FDOC includes conditions to assure compliance with this rule. Compliance is expected.

Regulation II - Permits

Rule 2010 – Permits Required

This rule requires any person who is building, altering, replacing or operating any source that emits, may emit air contaminants, or may reduce emissions, to first obtain authorization from the District in the form of an Authority to Construct or a Permit to Operate. Obtaining the DOC will assure compliance with this rule.

Rule 2201 – New and Modified Stationary Source Review Rule

The main function of the District's New Source Review Rule is to allow for the issuance of Authorities to Construct, Permits to Operate, the application of BACT to new or modified permit source and to require the new permit source to secure emission offsets.

Section 4.1 – Best Available Control Technology

Best Available Control Technology (BACT) is defined as the most stringent emission limitation or control technique of the following: a) achieved in practice for a category and class of source; b) contained in any State Implementation Plan and that have been approved by the U.S.EPA for a category and class of source; c) contained in an applicable federal New Source Performance Standard; or d) any other emission limitation or control technique that the District's Air Pollution Control Officer (APCO) finds is technologically feasible and is cost effective. BACT is required for any new or modified emission unit that results in an emissions increase of 2.0 lbs/day. However, Section 4.2.1 states that BACT is not required for CO emissions from any new or modified emissions unit if those sources emit less than 200,000 lbs/year of CO. In the case of GWF Henrietta, BACT applies for NOx, VOC, CO, SO_2, and PM10 emissions from the natural gas turbines. The District has concluded that the project meets BACT requirements for the gas turbines, auxiliary boiler, and firewater pump engine (SJVAPCD 2009b). Compliance is expected.

Section 4.5 through 4.13 – Emission Offset Requirements

Section 4.5 specifies that emissions offsets for new or modified sources are required when their emissions are equal to or exceed the following levels:

Oxides of Nitrogen, NOx – 20,000 lbs/year;

Volatile Organic Compounds, VOC – 20,000 lbs/year;

Carbon Monoxide, CO – 200,000 lbs/year;

PM10 – 29,200 lbs/year;

Sulfur Oxides, SOx – 54,750 lbs/year.

Under the original HPP project, offsets were provided to meet District rule requirements and staff recommended CEQA mitigation. Therefore, GWF Henrietta is only required to offset the difference between the proposed-post project potential to emit and the current permitted emission levels after consideration of the already submitted ERCs. Reduction in NOx emissions is expected upon completion of the proposed project, which for District purposes would be utilized to offset an increase in PM10 emissions. Although full offset for VOC was provided under the original HPP project, GWF Henrietta is not required to offset VOC since VOC emissions would be under the offset threshold. Offsets for CO and SO_2 are not required since emissions of these pollutants would still remain under the offset thresholds.

Section 4.6 specifies that emissions offsets are not required for increases of CO in attainment areas, if the project owner demonstrates that the emissions increase will not cause or contribute to a violation of the ambient air quality standards, and that those emissions are consistent with Reasonable Further Progress. The District has evaluated the project's CO emissions and has concluded that they are consistent with Reasonable Further Progress and do not require offsets.

Section 4.8 specifies that the emission offsets provided shall be adjusted according to the distance of the offset from the project proposed site. The ratios are:

- Internal or on-site source – 1 to 1;
- Within 15 miles of the source – 1.2 to 1 (non-major source), or 1.3 to 1 (major source); and
- 15 miles or more from the source – 1.5 to 1.

Section 4.13.1 specifies that major sources (defined as those sources that emit greater than 25 tons of NOx and VOC, 100 tons CO, or 70 tons of PM10 and SOx) that are shut down and thus generate an ERC may not be used as an offset for a new major source (like Starwood) unless those ERCs are included in an EPA-approved attainment plan.

Section 4.13.3 allows for the use of interpollutant offsets (including PM10 precursors for PM10) on a case-by-case basis, provided that the project owner demonstrates that the emissions increase will not cause a violation of any ambient air quality standard. The ratio for interpollutant trading shall be based on an air quality analysis and shall be equal to or greater than the minimum offsetting requirement (the distance ratios) of this rule (Section 4.8).

Section 4.13.4 requires Actual Emissions Reductions (AER) used as offsets to have occurred during the same calendar quarter as the emissions increases being offset. Exceptions to this rule (4.13.6 through 4.13.9) allow PM emission reductions that occurred from October through March to offset PM emissions occurring anytime during the year, for NOx and VOC emission reductions that occurred from April through November to offset NOx and VOC emissions occurring anytime during the year, and for CO emission reductions that occurred from November through February to offset CO emissions occurring anytime during the year.

The Districts has evaluated the offset need and the previous ERC submittal for the HPP. The District has found that the ERC previously submitted will comply with these regulations (SJVAPCD 2009b). The District is allowing the use of the previously submitted NOx credits to be used for PM10 offsetting at an interpollutant offset ratio 2.629:1. Compliance with this rule is expected.

Section 4.14 – Ambient Air Quality Standards

Section 4.14.1 requires that a new source not cause, or make worse, the violation of an ambient air quality standard as demonstrated through analysis with air dispersion models. The District completed the required modeling analysis and found that the project would comply with this regulation as the emissions would not cause new violations for the attainment pollutants and would not cause a significant increase in PM10 levels. The Districts PM10 modeling determined the following comparison with U.S.EPA PM10 significance levels:

	Significance Level	**Facility Impact**
PM10 24-hour	5 $\mu g/m^3$	0.60 $\mu g/m^3$
PM10 Annual	1 $\mu g/m^3$	0.039 $\mu g/m^3$

Staff also reviewed the project owner's modeling analysis that indicates no new exceedances of ambient air quality standards. Compliance with this rule is expected.

Section 4.15 – Additional Requirements for new Major Sources and Federal Major Modifications

Section 4.15.2 requires that the owner of a proposed new major source or federal major modification demonstrate to the satisfaction of the District that all major stationary sources subject to emission limitations that are owned or operated by the project owner or any entity controlling or under common control with the project owner in California, are in compliance or on a schedule for compliance with all applicable emission limitations and standards. The project owner's compliance demonstration has been accepted by the District and is included in the District's FDOC (SJVAPCD 2009b).

Section 5.0 – Administrative Requirements

Section 5.8 applies to all power plants proposed to be constructed within the SJVAPCD, where an Application for Certification (AFC) or a Notice of Intention has been submitted to the Energy Commission. It describes the actions to be taken by SJVAPCD to provide information to Energy Commission and ARB to ensure that District's rules and regulations will be satisfied. After the Application has been submitted to Energy Commission and other responsible agencies, including SJVAPCD, the APCO is required to conduct a Determination of Compliance review, identical to that which would be performed if an Application for an Authority to Construct had been received for the power plant. If the AFC does not meet the requirements of this regulation, then the APCO is required to inform the Energy Commission within 20 calendar days following receipt of the AFC, including specifying what additional information is required. In such an instance, the AFC is considered to be incomplete and returned to the project owner for resubmittal. The GWF Henrietta project is a petition for amendment rather than an AFC for a new or amended project. However, the District is treating the project as if it were a full AFC project. With the submittal of the FDOC compliance is assumed.

Rule 2520 – Federally Mandated Operating Permits

Rule 2520 requires that a project owner file a Title V Operating Permit from the U.S.EPA with the District within 12 months of commencing operation. A project is subject to this requirement if any of the following apply: the project is a major stationary source (under PSD definitions), it has the potential to emit greater than 100 tons per year of a criteria pollutant, any equipment permitted is subject to New Source Performance Standards, the project is subject to Title IV Acid Rain program, or the owner is required to obtain a PSD Permit from the U.S.EPA. The Title V Permit application requires that the owner submit information on the operation of the air polluting equipment, the emission controls, the quantities of emissions, the monitoring of the equipment as well as other information requirements. The FDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 2540 – Acid Rain Program

A project greater than 25 megawatts (MW) and installed after November 15, 1990, must submit an acid rain program permit application to the District. The acid rain requirements will become part of the Title V Operating Permit (Rule 2520). Monitoring of the NOx and SOx emissions and a relatively small quantity of SOx allowances (from a

national SOx allowance bank) will be required as well as the use of a NOx CEM. The FDOC includes conditions to assure compliance with this rule. Compliance is expected.

Regulation IV - Prohibitions

Rule 4001 – New Source Performance Standards

Rule 4001 specifies that a project must meet the requirements of the Federal New Source Performance Standards (NSPS), according to Title 40, Code of Federal Regulations, Part 60, Chapter 1. Subpart KKKK, that overrides subpart GG, which pertain to Stationary Gas Turbines, requires that a project meet specific NOx and SO_2 standards, meet continuous emission monitoring system requirements, meet various emission and fuel reporting requirements, and meet specified NOx and SOx performance testing requirements. The District has carefully evaluated this rule in the FDOC (SJVAPCD 2009b) and the FDOC includes conditions to assure compliance with this rule. Compliance is expected.

Subpart Dc applies to the auxiliary boiler. Since the auxiliary boiler is only fired on natural gas the only applicable parts of this regulation are the fuel monitoring requirements. The District has proposed conditions that meet the requirements of this regulation.

Subpart IIII applies to the new firewater engine. The District has evaluated this request and has determined that the proposed Tier 3 engine will meet the emission requirements of this regulation and the District has proposed conditions that will ensure compliance with the record keeping and maintenance provision of this regulation.

Rule 4002 – National Emission Standards for Hazardous Air Pollutants

Rule 4002 incorporates the National Emission Standards for Hazardous Air Pollutants (HAPs) from Part 61 and Part 63, Chapter I, Subchapter C, Title 40 CFR and applies to major sources of HAPs. The facility is not forecast as a major HAPs source. Compliance is expected.

Rule 4101 – Visible Emissions

Rule 4101 prohibits visible air emissions, other than water vapor, of more than No. 1 on the Ringelmann chart (20 percent opacity) for more than three minutes in any one-hour. Considering the control equipment (SCR/CO catalyst) on the turbines no visible emissions are expected during normal operation of the facility. The FDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 4102 – Nuisance

This rule prohibits any emissions “which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or public or which cause or have a natural tendency to cause injury or damage to business or property.” The types of emission sources at the facility are not expected to cause the potential for nuisance. The FDOC includes a condition to assure compliance with this rule. Compliance is expected.

Rule 4201 – Particulate Matter Concentration

Rule 4201 limits particulates emissions from any source that emits or may emit dust, fumes, or total suspended particulate matter to less than 0.1 grain per dry standard cubic foot (gr/dscf) of gas calculated to 12 percent of carbon dioxide. The particulate matter grain loading expected for the proposed facility equipment are less than this standard. The FDOC includes a condition to assure compliance with this rule. Compliance is expected.

Rule 4202 – Particulate Matter Emission Rate

This rule limits particulate matter emissions for any source operation that emits or may emit particulate matter emissions, by establishing allowable emission rates. Calculation methods for determining the emission rate based on process weight are specified. Gaseous and liquid fuels are exempt, so the gas turbines are exempt from this rule.

Rule 4301 – Fuel Burning Equipment

Rule 4301 provides limits on the concentration of combustion contaminants and specifies maximum emission rates for NOx, SO_2, and combustion contaminant emissions (particulates) for any fuel burning equipment, except for air pollution control equipment which is exempt. The specified limits are 140 lbs/hour of NOx (calculated as NO_2), 200 lbs/hour of SO_2, 0.1 gr/dscf of gas calculated to 12 percent of carbon dioxide and 10 lbs/hour of combustion contaminants. The gas turbines do not meet the definition of fuel burning equipment as stated in this rule and are therefore exempt. The use of California diesel fuel will ensure compliance for the firewater pump engine.

Rule 4304 – Equipment Tuning Procedures for Boilers, Steam Generators, and Process Heaters

Pursuant to District Rules 4305, 4306, and 4320, boiler tuning is required during years that annual source testing is required. However, units that are equipped with an APCO approved CEMS or an APCO approved alternate monitoring scheme where the applicable emissions are periodically monitored are not required to perform tuning. The project owner has requested the option to install a CEMS or utilize one of the District's pre-approved alternate monitoring schemes. Depending on which option GWF Henrietta chooses, they may or may not be subject to the requirements of this rule.

Rule 4305 – Boilers, Steam Generators, and Process Heaters – Phase 2

Rule 4305 provides limits on the NOx and CO emission rates of boilers, steam generators, and process heaters. Since emission limits and all other requirements of District Rule 4320 are equivalent or more stringent than the District Rule 4305, compliance with this rule is expected as compliance with Rule 4320 is expected as discussed below.

Rule 4306 – Boilers, Steam Generators, and Process Heaters – Phase 3

Rule 4306 provides limits on the NOx and CO emission rates of boilers, steam generators, and process heaters. Since emission limits and all other requirements of District Rule 4320 are equivalent or more stringent than the District Rule 4306, compliance with this rule is expected as compliance with Rule 4320 is expected as discussed below.

Rule 4320 – Advanced Emission Reduction Options for Boilers, Steam Generators, and Process Heaters Greater than 5.0 MMBtu/hr

Rule 4320 provides limits on the emission rates of boilers, steam generators, and process heaters of which capacities are greater than 5.0 MMBtu/hr. Emission limits for the proposed 42.0 MMBtu/hr boiler are 7 ppmvd or 0.008 lbs/MMBtu for NOx, and 400 ppmvd for CO. The project owner proposes that emission rates from the boiler would not exceed any of the following limits: NOx – 6.0 ppmvd at 3% O_2 or 0.0073 MMBtu; CO – 50.0 ppmvd at 3% O_2 or 0.037 lbs/MMBtu; VOC – 0.005 lbs/MMBtu; PM10 – 0.0076 lbs/MMBtu or SOx – 0.0007 lbs/MMBtu. Therefore, compliance is expected.

Rule 4351 – Boilers, Steam Generators, and Process Heaters – Phase 1

This rule limits emission of NOx from boilers, steam generators and process heaters at NOx major sources that are not located west of Interstate 5 in Fresno, Kings, or Kern Counties. This rule is satisfied when the unit is in compliance with Rule 4320; therefore, compliance with Rule 4351 is expected.

Rule 4702 – Internal Combustion Engines – Phase 2

Rule 4702 provides monitoring and record keeping requirements for standby emergency engine. The District has provided conditions for the firewater pump engine to ensure compliance with this regulation.

Rule 4703 – Stationary Gas Turbines

This rule limits NOx and CO emissions from stationary gas turbines, and establishes requirements for testing, monitoring, and record keeping for NOx and CO emissions from new or modified stationary gas turbines with a designed power of 0.3 MW or higher and/or a maximum heat input rating of more than 3,000,000 Btu per hour. The use of BACT will ensure that the emission requirements of this rule are met. The FDOC includes conditions to assure compliance with this rule. Compliance is expected.

Rule 4801 – Sulfur Compounds

Rule 4801 limits the emissions of sulfur compounds to no greater than 0.2 percent by volume calculated as SO_2 on a dry basis averaged over 15 consecutive minutes. The use of pipeline quality natural gas and California diesel fuel will assure compliance with this rule. Compliance is expected.

Regulation VIII - Fugitive PM10 Prohibitions

Rule 8011 – General Requirements

Rule 8011 specifies the types of chemical stabilizing agents and dust suppressant materials that can (and cannot) be used to minimize fugitive dust from anthropogenic (man-made) sources. The rule also specifies test methods for determining compliance with visible dust emission (VDE) standards, stabilized surface conditions, soil moisture content, silt content for bulk materials, silt content for unpaved roads and unpaved vehicle/ equipment traffic areas, and threshold friction velocity (TFV). Records shall be maintained only for those days that a control measure was implemented, and kept for one year following project completion to demonstrate compliance. An owner subject to Rule 2520 (Federally Mandated Operating Permits) shall keep such records for five years. A fugitive dust management plan for unpaved roads and unpaved vehicle/ equipment traffic areas is discussed as an alternative for Rule 8061 and Rule 8071. The

FDOC includes conditions to assure compliance with all Regulation VIII rules. Compliance is expected.

Rule 8021 – Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities

This rule requires fugitive dust emissions throughout construction activities (from pre-activity to active operations and during periods of inactivity) to comply with the conditions of a stabilized surface area and to not exceed an opacity limit of 20 percent, by means of water application, chemical dust suppressants, or constructing and maintaining wind barriers. A Dust Control Plan is also required and shall be submitted to the APCO at least 30 days prior to the start of any construction activities on any site that will include 10 acres or more of disturbed surface area for residential developments, 5 acres or more of disturbed surface area for non-residential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. The FDOC includes conditions to assure compliance with all Regulation VIII rules. Compliance is expected.

Rule 8031 – Bulk Materials

Rule 8031 limits the fugitive dust emissions from the outdoor handling, storage and transport of bulk materials. It requires that fugitive dust emissions comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20 percent. It specifies that bulk materials be transported using wetting agents, with appropriate freeboard space in the vehicles, or be covered. It also requires that stored materials be covered or stabilized. The FDOC includes conditions to assure compliance with all Regulation VIII rules. Compliance is expected.

Rule 8041 – Carryout and Trackout

This rule limits carryout and trackout during construction, demolition, excavation, extraction, and other earthmoving activities (Rule 8021), from bulk materials handling (Rule 8031), from paved and unpaved roads (Rule 8061), and from unpaved vehicle and equipment traffic areas (Rule 8071) where carryout has occurred or may occur. Specifies acceptable (and unacceptable) methods for cleanup of carryout and trackout. The FDOC includes conditions to assure compliance with all Regulation VIII rules. Compliance is expected.

Rule 8051 – Open Areas

Rule 8051 requires any open area of 0.5 acres or more within urban areas, or three acres or more within rural areas, and contains at least 1,000 square feet of disturbed surface area to comply with the conditions of a stabilized unpaved road surface and to not exceed an opacity limit of 20 percent, by means of water application, chemical dust suppressants, paving, applying and maintaining gravel, or planting vegetation. The FDOC includes conditions to assure compliance with all Regulation VIII rules. Compliance is expected.

Rule 8061 – Paved and Unpaved Roads

Rule 8061 specifies the width of paved shoulders on paved roads and guidelines for medians. It requires gravel, roadmix, paving, landscaping, watering, and/or the use of chemical dust suppressants on unpaved roadways to prevent exceeding an opacity limit of 20 percent. Exemptions to this rule include “any unpaved road segment with less

than 26 annual average daily vehicle trips (AADT)." The FDOC includes conditions to assure compliance with all Regulation VIII rules. Compliance is expected.

Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas

This rule intends to limit fugitive dust from any unpaved vehicle and equipment traffic area by using gravel, roadmix, paving, landscaping, watering, and/or the use of chemical dust suppressants to prevent exceeding an opacity limit of 20 percent. Exemptions to this rule include "unpaved vehicle and equipment traffic areas with less than 50 Average Annual Daily Trips (AADT)." The FDOC includes conditions to assure compliance with all Regulation VIII rules. Compliance is expected.

CONCLUSIONS AND RECOMMENDATIONS

The requested changes in project design and related construction would conform with applicable Federal, State, and SJVAPCD air quality laws, ordinances, regulations, and standards, and the amended project would not cause significant air quality impacts, provided that the recommended staff Conditions of Certification (COCs) and District COCs are included as provided below.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff recommends the following conditions of certification to address the potential impacts associated with the construction and operation of the GWF Henrietta. These conditions include the SJVAPCD conditions from the FDOC, with appropriate staff proposed verification language for each condition, as well as Energy Commission staff proposed conditions. The revisions and additions to the currently approved conditions are shown in underline and strikeout.

Due to the significant revisions in the District conditions for this facility and staff's compilation of certain conditions, **AIR QUALITY Table 26** has been prepared to show which conditions remain, altered or unaltered, from the original list of District conditions, which conditions are new, and how staff's numbering of the conditions relates to the District's list of conditions.

AIR QUALITY Table 26
District's Conditions with Corresponding Commission Conditions of Certification

Current Conditions of Decision	Current SJVAPCD Conditions	Revised Conditions of Certification
Turbines		
	1	AQ-1
AQ-40	2	AQ-2
	3	AQ-3
AQ-1	4	AQ-4
	5	AQ-5
	6	AQ-6
	7	AQ-7
	8	AQ-8
	9	AQ-9

Current Conditions of Decision	Current SJVAPCD Conditions	Revised Conditions of Certification
	10	AQ-10
	11	AQ-11
	12	AQ-12
	13	AQ-13
	14	AQ-14
	15	AQ-15
	16	AQ-16
AQ-4	17	AQ-17
AQ-5	18	AQ-18
AQ-6	19	AQ-19
AQ-7	20	AQ-20
AQ-8	21	AQ-21
AQ-10	22	AQ-22
AQ-9	23	AQ-23
AQ-11	24	AQ-24
AQ-16	25	AQ-25
AQ-19	26	AQ-26
AQ-17	27, 28	AQ-27, -28
AQ-22	29	AQ-29
	30	AQ-30
	31	AQ-31
	32	AQ-32
	33	AQ-32
AQ-18	34	AQ-34
	35	AQ-35
	36	AQ-36
	37	AQ-37
AQ-20	38	AQ-38
AQ-21	39	AQ-39
	40	AQ-40
	41	AQ-41
AQ-23	42	AQ-42
AQ-26	43	AQ-43
	44	AQ-44
AQ-24	45, 46	AQ-45, -46
	47	AQ-47
AQ-25	48	AQ-48
AQ-29	49	AQ-49
	50	AQ-50
AQ-15	51	AQ-51
AQ-28	52	AQ-52
AQ-12	53	AQ-53
	54	AQ-54
AQ-14	55	AQ-55
	56	AQ-56
	57	AQ-57
	58	AQ-58
AQ-34	59	AQ-59
AQ-35	60	AQ-60

Current Conditions of Decision	Current SJVAPCD Conditions	Revised Conditions of Certification
	61	AQ-61
	62	AQ-62
	65	AQ-65
	66	AQ-66
	67	AQ-67
AQ-38	68	AQ-68
	69	AQ-69
AQ-36	70	AQ-70
AQ-37	71	AQ-71
AQ-31	72	AQ-72
AQ-32	73	AQ-73
AQ-39	74	AQ-74
AQ-41	75 to 90	AQ-75
AQ-42	91	AQ-76
	92	AQ-77
	93	AQ-78
	94	AQ-79
AQ-44	95	AQ-80
	96	AQ-81
	97	AQ-82
	98	AQ-83
	99	AQ-84
	100	AQ-85
AQ-2	Deleted	--
AQ-3	Deleted	--
AQ-13	Deleted	--
AQ-27	Deleted	--
AQ-30	Deleted	--
AQ-33	Deleted	--
AQ-43	Deleted	--
AQ-45	Deleted	--
AQ-46	Deleted	--
Emergency Generator		
	1	AQ-1
	2	AQ-2
	3	AQ-3
	4	AQ-4
AQ-48	5	AQ-86
AQ-50	6	AQ-87
AQ-49	7	AQ-88
AQ-53	8	AQ-89
AQ-54	9	AQ-90
AQ-56	10	AQ-91
	11	AQ-92
AQ-51	12	AQ-93
	13	AQ-94
AQ-55	14	AQ-95
	15	AQ-96
	16	AQ-97

Current Conditions of Decision	Current SJVAPCD Conditions	Revised Conditions of Certification
	17	AQ-98
AQ-57	18	AQ-99
	19	AQ-100
AQ-47	Deleted	--
AQ-52	Deleted	--
Natural Gas Fired Boiler		
	1	AQ-1
	2	AQ-2
	3	AQ-3
	4	AQ-4
	5	AQ-101
	6	AQ-102
	7	AQ-103
	8	AQ-104
	9	AQ-105
	10	AQ-106
	11	AQ-107
	12	AQ-108
	13	AQ-109
	14	AQ-110
	15	AQ-111
	16	AQ-112
	17	AQ-113
	18	AQ-114
	19	AQ-115
	20	AQ-116
	21	AQ-117
	22	AQ-118
	23	AQ-119
	24	AQ-120
	25	AQ-121
	26	AQ-122
	27	AQ-123
	28	AQ-124
	29	AQ-125
	30	AQ-126
	31	AQ-127
	32	AQ-128
Emergency Firewater Pump Engine		
	1	AQ-1
	2	AQ-2
	3	AQ-3
	4	AQ-4
	5	AQ-129
	6	AQ-130
	7	AQ-131
	8	AQ-132
	9	AQ-133

Current Conditions of Decision	Current SJVAPCD Conditions	Revised Conditions of Certification
	10	AQ-134
	11	AQ-135
	12	AQ-136
	13	AQ-137
	14	AQ-138
	15	AQ-139
	16	AQ-140
	17	AQ-142
	18	AQ-142
	19	AQ-143

STAFF CONDITIONS

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, 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 an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with conditions **AQ-SC3**, **AQ-SC4**, and **AQ-SC5**.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The 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 the 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.

1. All unpaved roads and disturbed areas in the project and laydown 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 reduced or eliminated during periods of precipitation.
2. No vehicle shall exceed 10 miles per hour on unpaved areas within the project and laydown construction sites.
3. The construction site entrances shall be posted with visible speed limit signs.
4. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned and free of dirt prior to entering paved roadways.
5. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.
6. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.
7. 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.
8. 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 runoff to roadways.
9. 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.
10. At least the first 500 feet of any public roadway exiting the construction site shall be swept visually clean, using wet sweepers or air filtered dry vacuum sweepers, at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on the public roadways.
11. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered or shall be treated with appropriate dust suppressant compounds.
12. 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 in a manner to provide at least two feet of freeboard.
13. 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.

14. Disturbed areas will be re-vegetated as soon as practical.

The fugitive dust requirements listed in this condition may be replaced with as stringent or more stringent methods as required by SJVAPCD Regulation VIII.

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 that have the potential to be transported (1) off the project site or (2) 200 feet beyond the centerline of the construction of linear facilities, or (3) within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

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

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shut-down 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 the additional mitigation measures will be accomplished within the time limits specified.

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

1. All diesel-fueled engines used in the construction of the facility shall be fueled only with ultra-low sulfur diesel, which contains no more than 15 ppm sulfur.

2. 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.

3. A good faith effort shall be made to find and use off-road construction diesel equipment that has a rating of 100 hp to 750 hp and that meets the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines as specified in Title 13, California Code of Regulations section 2423(b)(1). 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.

4. All construction diesel engines, which have a rating of 50 hp or more, shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in Title 13, California Code of Regulations section 2423(b)(1). The following exceptions for specific construction equipment items may be made on a case-by-case basis.

   (A) Tier 1 equipment will be allowed on a case-by-case basis only when the project owner has documented that no Tier 2 equipment is available for a particular equipment type that must be used to complete the project's construction. This shall be documented with signed written correspondence by the appropriate construction contractors along with documented correspondence with at least two construction equipment rental firms.

   (B) The construction equipment item is intended to be on site for five days or less.

   (C) 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.

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

6. All diesel heavy construction equipment shall not remain running at idle for more than five minutes, to the extent practical.

7. 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) copies of all diesel fuel purchase records, (3) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained, and (4) any other documentation deemed necessary by the

CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format at the project owner's discretion.

AQ-SC6 The wet surface air cooler shall have a mist eliminator with a manufacturer guaranteed mist reduction rate of 0.005 percent or less of the water recirculation rate.

The wet surface air cooler spray water shall be tested for total dissolved solids and that data shall be used to determine and report the particulate matter emissions from the wet surface air cooler. The wet surface air cooler spray water shall be tested at least once annually during the anticipated summer operation peak period (July through September).

The wet surface air coolers annual particulate (PM10/PM2.5) emissions shall be limited to 8 lbs/year. The project owner shall estimate annual particulate emissions from the wet surface air cooler using the water quality testing data and estimated spray water use. Compliance with the wet surface air cooler PM10 emission limit shall be demonstrated as follows:

PM10 = cooling water recirculation * total dissolved solids concentration in the blowdown water * design drift rate.

Verification: The project owner shall provide the CPM a copy of the manufacturer guarantee for the mist eliminator 30 days prior to installation of the wet surface air cooler. The project owner shall provide the water quality test results and the wet surface air cooler particulate (PM10/PM2.5) emissions estimates to the CPM as part of the fourth quarter's Quarterly Operational Report (**AQ-68**).

DISTRICT FINAL DETERMINATION OF COMPLIANCE CONDITIONS (SJVAPCD 2009b)

General Facility Conditions

AQ-1 This Determination of Compliance serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201]

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

AQ-~~40~~2 Prior to operating with modifications authorized by this Determination of Compliance, the facility shall submit an application to modify the Title V permit with an administrative amendment in accordance with District Rule 2520 Section 5.3.4. [District Rule 2520, 5.3.4] ~~Permittee shall submit an application to comply with Rule 2520 - Federally Mandated Operating Permits within twelve months of commencing operation. [District Rule 2520]~~

Verification: The project owner shall submit to the CPM copies of the Title V operating permit application within five working days of its submittal by the project owner to the District. ~~The project owner/operator shall file their application with the District within twelve months of commencing operation.~~

AQ-3 To the extent this Determination of Compliance serves as an Authority to Construct, said Authority to Construct shall not become effective until the California Energy Commission approves the Application for Certification. [California Environmental Quality Act and District Rule 2201, Section 5.8.8]

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

AQ-~~1~~4 The ~~project owner~~ ~~permittee~~shall not begin actual onsite construction of the equipment authorized by this Determination of Compliance ~~Authority to Construct~~until the lead agency satisfies the requirements of the California Environmental Quality Act (CEQA). [California Environmental Quality Act]

Verification: The project owner/operator shall keep proof of the project's District air permit and CEC certification including copies of all permit conditions and Conditions of Certification onsite starting at the commencement of construction through the final decommissioning of the project. The project owner shall make the District's permit conditions and Conditions of Certification available at the project site to representatives of the District, ARB, EPA and the Energy Commission for inspection.

Equipment Description, UNIT C-3929-1-5 and UNIT C-3929-2-5:
Modification of 46.9 MW nominally rated simple-cycle peak-demand power generating systems #1 and #2, each consisting of a General Electric Model LM 6000 PC Sprint natural gas fired combustion turbine generator with water spray premixed combustion system, served by a selective catalytic reduction (SCR) system and an oxidation catalyst: Correct nominal rating of power generating system to 47.5 MW and convert the existing power generating system to a simple cycle or combined cycle configuration by (1) Removing the existing oxidation catalyst, selective catalytic reduction system and 85' exhaust stack; (2) installing a new once through heat recovery steam generator; (3) installing a new oxidation catalyst, selective catalytic reduction system and 91.5' tall exhaust stack; and (4) installing a 25 MW nominally rated condensing steam turbine generator and its associated lube oil cooler (shared between C-3929-1 and C-3929-2)

The following Conditions of Certification apply per turbine unit unless otherwise identified.

AQ-5 The owner/operator of GWF Henrietta shall minimize the emissions from the gas turbine to the maximum extent possible during the commissioning period. Conditions **AQ-6** through **AQ-16** shall apply only during the commissioning period as defined below. Unless otherwise indicated, Conditions **AQ-17** through **AQ-85** shall apply after the commissioning period has ended. [District Rule 2201]

Verification: The project owner shall submit to the CPM the monthly commissioning status report by the 10th of each month and the source test data and CTG operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-6 Commissioning activities are defined as, but not limited to, all testing, adjustment, tuning, and calibration activities recommended by the equipment

manufacturers and the GWF Henrietta construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems. [District Rule 2201]

Verification: The monthly commissioning status report shall be submitted to the CPM by the 10th of each month for the previous month, for all months with turbine commissioning activities following the turbine first fire date. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-7 Commissioning period shall commence when all mechanical, electrical, and control systems are installed and individual system startup has been completed, or when a gas turbine is first fired, whichever occurs first. The commissioning period shall terminate when the plant has completed initial performance testing and is available for commercial operation. [District Rule 2201]

Verification: The monthly commissioning status report shall be submitted to the CPM by the 10th of each month for the previous month, for all months with turbine commissioning activities following the turbine first fire date. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-8 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the combustors of this unit shall be tuned to minimize emissions. [District Rule 2201]

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

AQ-9 At the earliest feasible opportunity, in accordance with the recommendations of the equipment manufacturer and the construction contractor, the Selective Catalytic Reduction (SCR) system and the oxidation catalyst shall be installed, adjusted, and operated to minimize emissions from this unit. [District Rule 2201]

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

AQ-10 Coincident with the end of commission period and the steady-state operation of the SCR system and the oxidation catalyst, NO_X and CO emissions from this unit shall comply with the limits specified in condition **AQ-26** or **AQ-30**. [District Rule 2201]

Verification: The project owner shall submit to the CPM the source test data and CTG CEMs operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-11 The project owner shall submit a plan to the District at least four weeks prior to the first firing of this unit, describing the procedures to be followed during the commissioning period. 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 combustors, the installation and operation of the SCR systems and the oxidation catalyst, the installation, calibration, and testing of the NO_X and CO continuous emissions monitors, and any activities requiring the firing of this unit without abatement by the SCR system or oxidation catalyst. [District Rule 2201]

Verification: The project owner shall submit to the CPM for review and the District for approval the commissioning plan at least four weeks prior to the first firing of turbines. The project owner shall notify the CPM and District no later than 30 days prior to the proposed start date of commissioning and expected duration.

AQ-12 Emission rates from this CTG, during the commissioning period, shall not exceed any of the following limits: NO_X (as NO_2) – 52.0 lb/hr; CO – 40.5 lb/hr; VOC (as methane) – 1.20 lb/hr; PM10 – 2.20 lb/hr; or SO_X (as SO_2) – 0.33 lb/hr. [District Rule 2201]

Verification: The project owner shall submit to the CPM the source test data and CTG CEMs operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-13 During the initial commissioning activities, the project owner shall demonstrate compliance with the NO_X emission limit specified in **AQ-12** through the use of a properly operated and maintained continuous emissions monitor located within the inlet section of the steam generator unit. Upon completion of the initial commission activities and with the installation of the SCR system and oxidation catalyst, the project owner shall demonstrate compliance with the NOx and CO emission limits specified in **AQ-12** through the use of a properly operated and maintained continuous emission monitors and recorders as specified in **AQ-53** and **AQ-55**. The monitored parameters for this unit shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation). [District Rule 2201]

Verification: The project owner shall provide the source test data and CPM CEMs data demonstrating compliance with this condition as part of the monthly commissioning status report.

AQ-14 During the initial commissioning activities, the inlet NOx continuous emission monitor specified in this permit shall be installed, calibrated, and operational prior to the first re-firing of this unit. Upon completion of the initial commission activities and the installation of the SCR system and oxidation catalyst, the exhaust stack NOx and CO continuous emissions monitor specified within this permit shall be installed, calibrated, and operational prior to the first re-firing of this unit. After first re-firing, the detection range of the each continuous emission monitor shall be adjusted as necessary to accurately measure the resulting range of NO_X and/or CO emission concentrations. [District Rule 2201]

Verification: The project owner shall provide a protocol for the installation, calibration, and testing for the SCR system continuous monitors at least 60 days prior to SCR system use. The project owner shall submit to the CPM and District the SCR

system operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68)**.

AQ-15 The total number of firing hours of this unit without abatement of emissions by the SCR system and the oxidation catalyst shall not exceed 430 hours during the commissioning period. Such operation of this unit without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system and the oxidation catalyst in place. Upon completion of these activities, the project owner shall provide written notice to the District and the unused balance of the 430 firing hours without abatement shall expire. [District Rule 2201]

Verification: A log of the dates, times, and cumulative unit operating hours when fuel is being combusted during the commissioning period shall be maintained by the project owner. The project owner shall submit, commencing one month from the time of gas turbine first fire, a monthly commissioning status report throughout the duration of the commissioning phase that demonstrates compliance with the requirements listed in this condition. The monthly commissioning status report shall be submitted to the CPM by the 10th of each month for the previous month, for all months with turbine commissioning activities following the turbine first fire date. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-16 The total mass emissions of NO_X, CO, VOC, PM10, and SO_X that are emitted during the commissioning period shall accrue towards the consecutive twelve month emission limits specified in **AQ-39**. [District Rule 2201]

Verification: The monthly commissioning status report shall be submitted to the CPM by the 10th of each month for the previous month, for all months with turbine commissioning activities following the turbine first fire date. The project owner shall submit the total mass emissions of NOx, CO, VOC, PM10, and SOx in the 12th month commissioning status report in compliance with this condition.

AQ-4~~5~~17 A SCR system and oxidation catalyst shall serve this ~~the~~ gas turbine engine. Exhaust ducting may~~shall~~ be equipped (if required) with a fresh air inlet ~~and~~ blower to be used to lower the exhaust temperature prior to inlet of the SCR system catalyst. The project owner ~~Permittee~~ shall submit SCR and oxidation catalyst design details to the District at least ~~thirty (~~30~~)~~ days prior to commencement of construction. [District Rule 2201]

Verification: The project owner/operator shall provide copies of drawings of the catalyst systems chosen and design details to the CPM and the District at least thirty (30) days prior to the commencement of construction of the SCR system~~permanent foundations~~.

AQ-~~5~~18 Project owner ~~Permittee~~ shall submit continuous emission monitor design, installation, and operational details to the District at least ~~thirty (~~30~~)~~ days prior to commencement of construction. [District Rule 2201]

Verification: The project owner/operator shall provide copies of drawings of the continuous emission monitor ~~and~~ system design, installation, and operations details to

the CPM and the District at least ~~thirty (~~30~~)~~ days prior to the commencement of construction of the CEM system~~permanent foundations~~.

AQ-~~6~~19 When operating in simple-cycle mode and when operating in combined-cycle mode, the project owner ~~The permittee~~ shall submit to the District information correlating the NO_X control system operating parameters to the associated measured NO_X output. The information must be sufficient to allow the District to determine compliance with the NO_X emission limits of this permit ~~during times that the CEMS is not functioning properly~~ when no continuous emission monitoring data for NO_X is available or when continuous emission monitoring system is not operating properly. [District Rule 4703]

Verification: The project owner/operator shall provide the District with documentation correlating NOx control system operating parameters to the associated measured NOx output. Information must be sufficient to allow NOx emissions to be calculated during times when the CEMS is not functioning properly.

AQ-~~7~~20 All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District Rule 2201]

Verification: Upon request, the project owner/operator shall make all maintenance records and report available at the project site to representatives of the District, ARB, EPA and the Energy Commission for inspection.

AQ-~~8~~21 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-~~10~~22 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20 percent opacity. [District Rule 4101]

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

AQ-~~9~~23 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~11~~24 Combustion turbine generator (CTG) and electrical generator lube oil vents shall be equipped with mist eliminators. Visible emissions from lube oil vents shall not exhibit opacity of 5 percent or greater, except for up to three minutes in any hour. [District Rules 2201 and 4101]

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

AQ-~~16~~25 This ~~The~~ CTG shall be fired exclusively on PUC-regulated natural gas with a sulfur content of no greater than 0.25 grains of sulfur compounds (as S) per 100 dry scf of natural gas. [District Rule 2201 and 40 CFR 60.4330(a)(2)]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~19~~26 ~~Emissions rates from this unit, except during startup and shutdown events, shall not exceed any of the following: NOx (as NO_2) – 6.21 lb/hr and 3.6 ppmvd @ 15% O_2; VOC (as methane) – 1.17 lb/hr and 2.0 ppmvd @ 15% O_2; CO – 6.25 lb/hr and 6.0 ppmvd @ 15% O_2; PM10 – 2.0 lb/hr; or SOx (as SO_2) – 0.33 lb/hr.~~ When operating in simple-cycle mode, the steady state emission rates from this CTG, except during startup and shutdown periods, shall not exceed any of the following limits: NO_X (as NO_2) – 4.24 lb/hr and 2.5 ppmvd @ 15 percent O_2; CO – 3.10 lb/hr and 3.0 ppmvd @ 15 percent O_2; VOC (as methane) – 1.20 lb/hr and 2.0 ppmvd @ 15 percent O_2; PM10 – 2.20 lb/hr; or SO_X (as SO_2) – 0.33 lb/hr. NO_X (as NO_2) emission rates are one hour rolling averages. All other emission ~~concentration limits~~ rates are three hour rolling averages. [District Rules 2201, 4001 and 4703 and 40 CFR 60.4320(a) & (b)]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~17~~27 ~~During startup or shutdown of any gas turbine engine, combined emissions from the two gas turbine engines (C-3929-1 and C-3929-2) shall not exceed the following: NOx (as NO_2) – 15.4 lb, CO – 15.4 lb, and VOC – 1.4 lb per event. [California Environmental Quality Act]~~ When operating in simple-cycle mode, during start-up, CTG exhaust emission rates shall not exceed any of the following limits: NO_X (as NO_2) – 7.70 lb/event; CO – 7.70 lb/event; VOC (as methane) – 0.70 lb/event; PM10 – 0.13 lb/event; or SO_X (as SO_2) – 0.055 lb/event. [District Rules 2201 and 4703]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~17~~28 ~~During startup or shutdown of any gas turbine engine, combined emissions from the two gas turbine engines (C-3929-1 and C-3929-2) shall not exceed the following: NOx (as NO_2) – 15.4 lb, CO – 15.4 lb, and VOC – 1.4 lb per event. [California Environmental Quality Act]~~ When operating in simple-cycle mode, during shutdown, CTG exhaust emission rates shall not exceed any of the following limits: NO_X (as NO_2) – 7.70 lb/event; CO – 7.70 lb/event; VOC (as methane) – 0.70 lb/event; PM10 – 0.20 lb/event; or SO_X (as SO_2) – 0.055 lb/event. [District Rules 2201 and 4703]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~22~~29 When operating in simple-cycle mode, the ~~The~~ ammonia (NH_3) emissions shall not exceed either of the following limits: 6.20 lb/hr or 10 ppmvd @ 15 percent O_2 over a 24 hour rolling average. [District Rules 2201 and 4102]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-30 When operating in combined-cycle mode, the steady state emission rates from this CTG, except during startup and shutdown periods, shall not exceed any of the following limits: NO_X (as NO_2) – 3.40 lb/hr and 2.0 ppmvd @ 15 percent O_2; CO – 3.10 lb/hr and 3.0 ppmvd @ 15 percent O_2; VOC (as methane) – 1.20 lb/hr and 2.0 ppmvd @ 15 percent O_2; PM10 – 2.20 lb/hr; or SO_X (as SO_2) – 0.33 lb/hr. NO_X (as NO_2) emission rates are one hour rolling averages. All other emission rates are three hour rolling averages. [District Rules 2201 and 4703 and 40 CFR 60.4320(a) & (b)]

Verification: The project owner shall submit to the CPM the source test data and CTG operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-31 When operating in combined-cycle mode, during start-up, CTG exhaust emission rates shall not exceed any of the following limits: NO_X (as NO_2) – 6.10 lb/event; CO – 3.00 lb/event; VOC (as methane) – 0.50 lb/event; PM10 – 2.20 lb/event; or SO_X (as SO_2) – 0.33 lb/event. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the CPM the source test data and CTG operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-32 When operating in combined-cycle mode, during shutdown, CTG exhaust emission rates shall not exceed any of the following limits: NO_X (as NO_2) – 2.08 lb/event; CO – 1.00 lb/event; VOC (as methane) – 0.20 lb/event; PM10 – 0.73 lb/event; or SO_X (as SO_2) – 0.11 lb/event. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the CPM the source test data and CTG operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-33 When operating in combined-cycle mode, the ammonia (NH_3) emissions shall not exceed either of the following limits: 3.10 lb/hr or 5 ppmvd @ 15 percent O_2 over a 24 hour rolling average. [District Rules 2201 and 4102]

Verification: The project owner shall provide the estimated daily ammonia concentration and daily ammonia emissions based on the procedures given in this condition and provide the annual source test data to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**), where the source test data is due in the quarter after the source test report is completed.

AQ-~~18~~34 A simple-cycle startup period~~event is~~ shall be defined as the period ~~beginning with turbine initial firing until the unit meets the lb/hr and ppmvd emission limits in condition AQ-19.~~ of time during which a unit is brought from a shutdown status until the unit meets the steady state simple-cycle lb/hr and ppmvd emission limits specified within this permit. A combined-cycle startup period shall be defined as the period of time beginning with the gas turbine operating in simple-cycle mode and the initial start sequence of the once

though heat recovery steam generator until the unit meets the steady state combined-cycle lb/hr and ppmvd emission limits specified within this permit. A combined-cycle shutdown shall be defined as the period of time during which the initial shutdown sequence is given for the once through heat recovery steam generator until the unit meets the steady state simple-cycle lb/hr and ppmvd emission limits specified within this permit. A simple-cycle shutdown shall be defined as the period of time during which a unit is taken from an operational to a non-operational status as the fuel supply to the unit is completely turned off. ~~A shutdown event is defined as the period beginning with initiation of turbine shutdown sequence and ending with cessation of firing of the gas turbine engine. Startup and shutdown of gas turbine engine shall not exceed a time period of one hour each per occurrence. The number of startups and shutdowns shall not exceed 4 events per hour (i.e. two startup/shutdown cycles).~~ [District Rules 2201 and 4703]

Verification: The project owner/operator shall provide records of compliance as part of the ~~quarterly reports~~ Quarterly Operation Reports ~~of Condition~~ (**AQ-~~31~~68**).

AQ-35 The duration of each startup or shut down time shall not exceed two hours. Startup and shutdown emissions shall be counted toward all applicable emission limits. [District Rules 2201 and 4703]

Verification: The project owner shall submit to the CPM and District the CTG startup and shutdown operating data demonstrating compliance with this condition as part of the fourth quarter's Quarterly Operation Reports (**AQ-68**).

AQ-36 The emission control systems shall be in operation and emissions shall be minimized insofar as technologically feasible during startup and shutdown. [District Rule 4703]

Verification: The project owner shall submit to the CPM and District the CTG startup and shutdown operating data demonstrating compliance with this condition as part of the fourth quarter's Quarterly Operation Reports (**AQ-68**).

AQ-37 During all types of operation, including startup and shutdown periods, ammonia injection in to the SCR system shall occur once the minimum temperature at the catalyst face has been reached to ensure NOx emission reductions can occur with a reasonable level of ammonia slip. The minimum catalyst face temperature shall be determined during the final design phase of this project and shall be submitted to the District at least 30 days prior to commencement of construction. [District Rule 2201]

Verification: The project owner shall submit to the CPM and District the CTG startup and shutdown operating data demonstrating compliance with this condition as part of the fourth quarter's Quarterly Operation Reports (**AQ-68**).

AQ-~~20~~38 Maximum daily emissions from ~~this unit~~ the CTG shall not exceed any of the following limits: NOx(as NO_2) – 129.7 lb/day; CO – 103.1 lb/day; VOC – 30.8 lb/day; PM10 – 52.1 lb/day; or SOx (as SO_2) – 7.9~~5~~ lb/day. ~~NOx (as NO_2) – 150.5 lb/day; VOC – 28.1 lb/day; CO – 151.5 lb/day PM10 – 48.0 lb/day; and SOx (as SO_2) – 7.9 lb/day.~~ [District Rule 2201]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~21~~39 ~~Maximum annual emissions from this unit, including startup and shutdown emissions, shall not exceed any of the following: NOx (as NO_2) – 49,510 lb/year; VOC – 2,844 lb/year; CO – 21,830 lb/year; PM10 – 16,000 lb/year; and SOx (as SO_2) – 2,640 lb/year.~~ Annual emissions from this CTG, calculated on a twelve month rolling basis, shall not exceed any of the following limits: NO_X (as NO_2) – 35,998 lb/year; CO – 20,705 lb/year; VOC – 4,683 lb/year; PM10 – 18,660 lb/year; or SO_X (as SO_2) – 2,819 lb/year. Compliance with the annul NOx and CO emission limits shall be demonstrated using CEM data and compliance with the annual VOC, PM10 and SOx emission limits shall be demonstrated using the most recent source test results. [District Rule 2201]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-40 Each one hour period shall commence on the hour. Each one hour period in a three hour rolling average will commence on the hour. The three hour average will be compiled from the three most recent one hour periods. Each one hour period in a twenty-four hour average for ammonia slip will commence on the hour. [District Rule 2201]

Verification: The project owner shall submit to the CPM the source test data and CTG operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-41 Daily emissions will be compiled for a twenty-four hour period starting and ending at twelve-midnight. Each month in the twelve consecutive month rolling average emissions shall commence at the beginning of the first day of the month. The twelve consecutive month rolling average emissions to determine compliance with annual emissions limitations shall be compiled from the twelve most recent calendar months. [District Rule 2201]

Verification: The project owner shall submit to the CPM the source test data and CTG operating data demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-~~23~~42 Compliance with the ammonia emission limits shall be demonstrated ~~by using~~ utilizing one of the following ~~calculation~~ procedures: ~~ammonia slip ppmv @ 15 percent O_2 = ((a-bxc/1,000,000)) x 1,000,000/b)~~ 1) calculate the daily ammonia emissions using the following equation: (ppmvd @ 15 percent O_2) = ((a - (b x c/1,000,000)) x (1,000,000 / b)) x d, where a = ammonia injection rate (lb/hr) / (17 lb/lb mol), b = dry exhaust flow rate (lb/hr) / (29 lb/lb mol), c = change in measured NOx concentration ppmvd @ 15 percent O_2 across the catalyst, and d = correction factor. The correction factor shall be derived annually during compliance testing by comparing the measured and calculated ammonia slip; 2.) Utilize another District-approved calculation method using measured surrogate parameters to determine the daily

ammonia emissions in ppmvd @ 15 percent O_2. If this option is chosen, the project owner shall submit a detailed calculation protocol for District approval at least 60 days prior to commencement of operation; 3.) Alternatively, the project owner may utilize a continuous in-stack ammonia monitor~~, acceptable to the District to monitor compliance.~~ to verify compliance with the ammonia emissions limit. If this option is chosen, the project owner shall submit a monitoring plan for District approval at least 60 days prior to commencement of operation. ~~At least 60 days prior to using a NH_3 CEM, the permittee shall submit a monitoring plan for District review and approval.~~ [District Rules 2201 and 4102]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~26~~43 When operating in simple-cycle mode and when operating in combined-cycle mode, ~~S~~source testing ~~of startup~~ to measure startup and shutdown NO_X, CO, and VOC~~, and PM10~~ mass emission rates shall be conducted for one of the gas turbines ~~engines~~ (C-3929-1 or C-3929-2) ~~upon initial operation~~ within 60 days after the end of the commissioning period~~and at least once every seven years thereafter. CEM relative accuracy shall be determined during startup source testing in accordance with 40 CFR 60, Appendix B.~~ [District Rules 1081 and 2201]

Verification: The results and field data collected during source tests shall be submitted to the CPM and the District within sixty (60) days of testing. Testing shall be conducted within sixty (60) days after the end of the commissioning period on one of the gas turbines~~of initial operation of one CTG and at least once every seven (7) years~~.

AQ-44 Source testing to measure start up and shutdown NOx, CO, and VOC mass emission rates shall be conducted for one of the gas turbines (C-3929-1 or C-3929-2) at least once every seven years. CEM relative accuracy shall be determined during startup and shutdown source testing in accordance with 40 CFR 60, Appendix F (Relative Accuracy Audit). If CEM data is not certifiable to determine compliance with NOx and CO startup or shutdown emission limits, then source testing to measure startup and shutdown NOx and CO mass emission rates shall be conducted at least once every 12 months. If an annual startup and shutdown NOx and Co relative accuracy audit demonstrates that the CEM data is certifiable, the startup and shutdown NOx and CO testing frequency shall return to the once every seven years schedule. [District Rules 1081 and 2201]

Verification: Testing shall be conducted within sixty (60) days of initial operation of one CTG and at least once every seven (7) years in compliance.

AQ-~~24~~45 ~~Source testing to measure the NO_x, CO, and VOC emission limits (lb/hr and ppmvd @ 15% O_2) shall be conducted within 60 days of initial operation of the CTG and at least once every twelve months thereafter. [District Rule 1081]~~When operating in simple-cycle mode, initial source testing to determine compliance with the steady state NOx, CO, VOC and NH_3 emission rates (lb/hr and ppmvd @ 15 percent O_2) and PM10 emission rate (lb/hr) shall be

conducted within 60 days after the end of the commissioning period. [District Rules 1081, 2201 and 4703 and 40 CFR 60.4400(a)]

Verification: The results and field data collected during source tests required by this condition shall be submitted to the CPM for review and the District for approval within 60 days of testing.

AQ-~~24~~46 ~~Source testing to measure the NO_x, CO, and VOC emission limits (lb/hr and ppmvd @ 15% O_2) shall be conducted within 60 days of initial operation of the CTG and at least once every twelve months thereafter. [District Rule 1081]~~When operating in combined-cycle mode, initial source testing to determine compliance with the steady state NO_X, CO, VOC and NH_3 emission rates (lb/hr and ppmvd @ 15 percent O_2) and PM10 emission rate (lb/hr) shall be conducted within 60 days after the end of the commissioning period. [District Rules 1081, 2201 and 4703 and 40 CFR 60.4400(a)]

Verification: The results and field data collected during source tests required by this condition shall be submitted to the CPM for review and the District for approval within 60 days of testing.

AQ-47 Source testing to determine compliance with the steady state NO_X, CO, VOC and NH_3 emission rates (lb/hr and ppmvd @ 15 percent O_2) and PM10 emission rate (lb/hr) shall be conducted at least once every 12 months. [District Rules 1081, 2201 and 4703 and 40 CFR 60.4400(a)]

Verification: The project owner will submit source test reports to the CPM for review and the District for approval within 60 days of the completion of those tests.

AQ-~~25~~48 ~~Source testing to measure the PM_{10} emission limit (lb/hr), the natural gas sulfur content limit, and the ammonia emission limit shall be conducted within 60 days of initial operation and at least once every twelve months thereafter. [District Rule 1081]~~ Testing to demonstrate compliance with the fuel sulfur content limit of 0.25 grains of sulfur compounds (as S) per 100 dry scf of natural has shall be conducted weekly. Once eight consecutive weekly tests show compliance, the fuel sulfur content testing frequency may be reduced to once every calendar quarter. If a quarterly test shows a violation of the sulfur content limit, then the weekly testing shall resume and continue until eight consecutive tests show compliance. Once compliance is shown on eight consecutive weekly tests, then testing may return to quarterly. [District Rule 2201 and 40 CFR 60.4360, 60.4365(a) and 60.4370(c)]

Verification: ~~The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing. Testing shall be conducted within 60 days of initial operation of each CTG and at least once every twelve months.~~ The project owner shall submit the quarterly fuel sulfur content values in the in the Quarterly Operation Reports (**AQ-68**) and shall document all emissions standard violation in each Quarterly Operation Report. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-~~29~~49 The following test methods shall be used: ~~PM10: EPA method 5 (front half and back half), NOx: EPA Method 7E or 20, CO: EPA method 10 or 10B, O_2: EPA Method 3, 3A, or 20, VOC: EPA method 18 or 25, ammonia: BAAQMD ST-1B, and fuel gas sulfur content: ASTM D3246.~~ NO_X - EPA Method 7E, 20 or ARB Method 100 (ppm basis), or EPA Method 19 (lb/MMbtu basis); CO - EPA Method 10, 10B or ARB Method 100; VOC - EPA Method 18 or 25; PM10 - EPA Method 5 and 202 (front half and back half) or 201 and 202a; ammonia - BAAQMD ST-1B; and O_2 - EPA Method 3, 3A, 20 or ARB Method 100. NOx testing shall also be conducted in accordance with the requirements of 40 CFR 60.4400(a)(2), (3), and (b). EPA approved alternative test methods, as approved by the District, may also be used to address the source testing requirements of this permit. [District Rules 1081, and 4703 and 40 CFR 60.4400(1)(i) and 40 CFR 60.4400(a)(2), (3), and (b)]

Verification: The project owner/operator shall provide records of compliance as part of Condition **AQ-~~28~~52**.

AQ-50 Fuel sulfur content shall be monitored using one of the following methods: ASTM Methods D1072, D3246, D4084, D4468, D4810, D6228, D6667 or Gas Processors Association Standard 2377. [40 CFR 60.4415(a)(1)(i)]

Verification: The project owner shall submit the quarterly fuel sulfur content values in the Quarterly Operation Reports (**AQ-68**) and make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-~~15~~51 The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NO_X, CO, and O_2 analyzer during District inspections. The sampling ports shall be located in accordance with the ARB regulation titled CARB Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081]

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

AQ-~~28~~52 ~~Compliance demonstration (source testing)~~Source testing shall be ~~by~~ District witnessed, or authorized~~,~~ and samples shall be collected by a California ARB certified testing laboratory. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified ~~thirty (~~30~~)~~ days prior to any compliance source test, and a source test plan must be submitted for approval ~~fifteen (~~15~~)~~ days prior to testing. The results of each source test shall be submitted to the District within ~~sixty (~~60~~)~~ days thereafter. [District Rule 1081 and 40 CFR 60.4375(b)]

Verification: The project owner/operator shall notify the CPM and the District thirty (30) days prior to any compliance source test. The project owner/operator shall provide a source test plan to the CPM and District for the CPM and District approval fifteen (15) days prior to testing. The results and field data collected by the source tests shall be submitted to the CPM and District within 60 days of testing.

AQ-~~12~~53 The CTG shall be equipped with a continuous monitoring system to measure and record ~~hours of operation and~~ fuel consumption. [District Rules 2201~~,~~ ~~4001,~~ and 4703]

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

AQ-~~12~~54 The SCR system shall be equipped with a continuous temperature monitoring system to measure and record the temperature at the catalyst face. [District Rules 2201]

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

AQ-~~14~~55 ~~The CTH shall be equipped with a continuous emission monitor (CEM) for NOx (before and after SCR system), CO, and O_2.~~ The owner or operator shall install, certify, maintain, operate and quality-assure a Continuous Emission Monitoring System (CEMS) which continuously measures and records the exhaust gas NO_X, CO and O_2 concentrations. Continuous emissions monitor(s) shall monitor emissions during all types of operation, including during startup and shutdown periods, ~~meet the requirements of 40 CFR part 60, Appendices B and F, and 40 CFR part 75, and District-approved protocol,~~ provided the CEMS passes the relative accuracy requirement for startups and shutdowns specified herein. If relative accuracy of CEMS cannot be demonstrated during startup conditions, CEMS results during startup and shutdown events shall be replaced with startup emission rates obtained from source testing to determine compliance with emission limits contained in this document. [District Rules ~~2201, 4001,~~ 1080 and 4703 and 40 CFR 60.4335(b)(1)]

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

AQ-56 The owner/operator shall develop and keep on site a quality assurance plan for the NOx CEMS. [40 CFR 60.4345(e)]

Verification: CEMS data summaries in compliance with this condition shall be submitted to the CPM as part of the Quarterly Operation Reports (**AQ-68**).

AQ-57 The CEMS shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period or shall meet equivalent specifications established by mutual agreement of the District, the ARB and the EPA. [District Rule 1080 and 40 CFR 60.4345(b)]

Verification: CEMS data summaries in compliance with this condition shall be submitted to the CPM as part of the Quarterly Operation Reports (**AQ-68**).

AQ-58 The NO_X, CO and O_2 CEMS shall meet the requirements in 40 CFR 60, Appendix F Procedure 1 and Part 60, Appendix B Performance Specification 2,3 and 4 (PS 2, 3 and 4), or 40 CFR 75, Appendix A, or shall meet equivalent

specifications established by mutual agreement of the District, the ARB, and the EPA. [District Rule 1080 and 40 CFR 60.4345(a)]

Verification: The project owner shall provide a protocol for the installation, calibration, the testing for the CEMS at least 60 days prior to the operation of CEMS. CEMS data summaries shall be submitted to the CPM as part of the Quarterly Operation Report (**AQ-68**).

AQ-~~34~~59 Audits of continuous emission monitors shall be conducted quarterly, except during quarters in which relative accuracy and ~~total accuracy testing is performed~~ compliance source testing are both performed, in accordance with EPA guidelines. The District shall be notified prior to completion of the audits. Audit reports shall be submitted along with quarterly compliance reports to the District. [District Rule 1080]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~35~~60 The owner/operator shall perform a relative accuracy test audit (RATA) for the NO_X, CO and O_2 CEMS as specified by 40 CFR Part 60, Appendix F, 5.11, or 40 CFR 75, Appendix B, at least once every four calendar quarters. The project owner~~permittee~~ shall comply with the applicable requirements for quality assurance testing and maintenance of the continuous emission monitor equipment in accordance with the procedures and guidance specified in 40 CFR Part 60, Appendix F. If the RATA test is conducted as specified in 40 CFR Part 75 Appendix B, the RATA shall be conducted on a lb/MMBtu basis. [District Rule 1080 and 40 CFR 60.4345(a)]

Verification: The project owner/operator shall provide records of compliance as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-61 Results of the CEM system shall be averaged over a one hour period for NO_X emissions and a three hour period for CO emissions using consecutive 15-minute sampling periods in accordance with all applicable requirements of CFR 60.13. [District Rule 4703 and 40 CFR 60.13]

Verification: CEMS data summaries in compliance with this condition shall be submitted to the CPM as part of the Quarterly Operation Reports (**AQ-68**).

AQ-62 When operating in simple-cycle mode, excess NOx emissions shall be defined as any operating hour in which the 1-hour rolling average NO_X concentration exceeds an applicable emissions limit. When operating in combined-cycle mode, excess NOx emission shall be defined as any 30 day operating period in which the 30 day rolling average NOx concentration exceeds an applicable emissions limit. A period of monitor downtime shall be any unit operating hour in which sufficient data are not obtained to validate the hour for either NO_X or O_2 (or both). [40CFR 60.4350(g), 40 CFR 60.4350(h) and 40 CFR 60.4380(b)(1)]

Verification: CEMS data summaries in compliance with this condition shall be submitted to the CPM as part of the Quarterly Operation Reports (**AQ-68**).

AQ-63 For the purpose of determining excess NOx emission, for each unit operating hour in which a valid hourly average is obtained, the data acquisition system and handling system must calculate and record the hourly NOx emission rate in units of ppm, using the appropriate equation from Method 19 of 40 CFR 60, Appendix A. For any hour in which the hourly O_2 concentration exceeds 19.0 percent O_2, a diluents cap value of 19.0 percent O_2 may be used in the emission calculations. [40CFR 60.4350(b) and 60.4350(f)]

Verification: CEMS data summaries in compliance with this condition shall be submitted to the CPM as part of the Quarterly Operation Reports (**AQ-68**).

AQ-64 Excess SOx emissions is each unit operating hour including in the period beginning on the date and hour of any sample for which the fuel sulfur content exceeds the applicable limits listed in this permit and ending on the date and hour that a subsequent sample is taken that demonstrates compliance with the sulfur limit. Monitoring downtime for SOx begins when a sample is not taken by its due date. A period of monitor downtime for SOx also begins on the date and hour of a required sample, if invalid results are obtained. A period of SOx monitoring downtime ends on the date and hour of the next valid sample. [40CFR 60.4350(a) and (c)]

Verification: CEMS data summaries in compliance with this condition shall be submitted to the CPM as part of the Quarterly Operation Reports (**AQ-68**).

AQ-65 The facility shall install and maintain equipment, facilities, and systems compatible with the District's CEM data polling software system and shall make CEM data available to the District's automated polling system on a daily basis. [District Rule 1080]

Verification: The project owner shall make the records required under this condition available for inspection by representatives of the District, ARB and the Energy Commission.

AQ-66 Upon notice by the District that the facility's CEM system is not providing polling data, the facility may continue to operate without providing automated data for a maximum of 30 days per calendar year provided the CEM data is sent to the District by a District-approved alternative method. [District Rule 1080]

Verification: The project owner shall provide the non-polled CEM data using a District approved alternative method and shall make that data available for inspection by representatives of the ARB and the Energy Commission.

AQ-67 The owner or operator shall, upon written notice from the APCO, provide a summary of the data obtained from the CEM systems. This summary shall be in the form and the manner prescribed by the APCO. [District Rule 1080]

Verification: The project owner shall make the records required under this condition available for inspection by representatives of the District, ARB and the Energy Commission.

AQ-~~38~~68 ~~The permittee shall submit a written report to the APCO for each calendar quarter, within 30 days of the end of the quarter, including:~~ The owner or operator shall submit a written report of CEM operations for each calendar quarter to the APCO. The report is due on the 30th day following the end of the calendar quarter and shall include the following: Time intervals, data and magnitude of excess NOx emissions, nature and the cause of excess (if known), corrective actions taken and preventive measures adopted; Averaging period used for data reporting corresponding to the averaging period specified in the emission test period used to determine compliance with an emission standard; Applicable time and date of each period during which the CEM was inoperative (monitor downtime), ~~(~~except for zero and span checks~~)~~, and the nature of system repairs and adjustments; ~~and~~ A negative declaration when no excess emissions occurred. [District Rule 1080 and 40 CFR 60.4375(a) and 60.4395]

Verification: The project owner/operator shall compile the required data and submit the quarterly reports to the CPM and the APCO within thirty (30) days of the end of the quarter.

AQ-69 APCO or an authorized representative shall be allowed to inspect, as determined to be necessary, the required monitoring devices to ensure that such devices are functioning properly. [District Rule 1080]

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

AQ-~~36~~70 Project owner shall notify the District of any breakdown condition as soon as reasonably possible, but no later than one hour after its detection, unless the owner or operator demonstrates to the District's satisfaction that the longer reporting period was necessary. [District Rule 1100, 6.1]

Verification: The project owner/operator shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~37~~71 The District shall be notified in writing within ten days following the correction of any breakdown condition. The breakdown notification shall include a description of the equipment malfunction or failure, the date and cause of the initial failure, the estimated emissions in excess of those allowed, and the methods utilized to restore normal operations. [District Rule 1100, 7.0]

Verification: The project owner/operator shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~31~~72 The project owner ~~permittee~~ shall maintain the following records: date and time, duration, and type of any startup, shutdown, or malfunction; performance testing, evaluations, calibrations, checks, adjustments, any period during which a continuous monitoring system or monitoring device was

inoperative, and maintenance of any continuous emission monitor. [District Rules 1080, 2201 and 4703 and 40 CFR 60.8(d)]

Verification: The project owner/operator shall compile required data and submit the information to the CPM in quarterly report (AQ-68) submitted no later than 30~~60~~ days after the end of each calendar quarter.

AQ-~~32~~73 The project owner ~~permittee~~ shall maintain the following records: hours of operation, fuel consumption (scf/hr and scf/rolling twelve month period), continuous emission monitor measurements, calculated ammonia slip, calculated NO_X and CO mass emission rates (lb/hr, lb/qtr and lb/twelve month rolling period), and VOC, PM10 and SOx mass emission rates (lb/twelve month rolling period). [District Rules 2201 and 4703]

Verification: The project owner/operator shall comply with the notification requirements of the District and submit written copies of these notification reports to the CPM as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~39~~74 ~~All records required to be maintained by this permit shall be maintained for a period of two years~~All records shall be maintained and retained on-site for a period of at least five years and shall be made ~~readily~~available for District inspection upon request. [District Rules 1070, 2201 and 4703]

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

AQ-~~41~~75 ~~Permittee shall submit an application to comply with Rule 2540 - Acid Rain Program. [District Rule 2540]~~The project owner shall comply with the following Acid Rain regulation requirements:

1. The owners and operators of each affected source and each affected unit at the source shall: (i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and (ii) Have an Acid Rain permit. [40 CFR 72]

2. The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75. [40 CFR 75]

3. The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program. [40 CFR 75]

4. The owners and operators of each source and each affected unit at the source shall: (i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)) not less than the total annual emissions of sulfur dioxide for the

previous calendar year from the unit; and (ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide. [40 CFR 73]

5. Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act. [40 CFR 77]

6. An affected unit shall be subject to the sulfur dioxide requirements starting on the later of January 1, 2000, or the deadline for monitoring certification under 40 CFR part 75, an affected unit under 40 CFR 72.6(a)(3) that is not a substitution or compensating unit. [40 CFR 72 and 40 CFR 75]

7. Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program. [40 CFR 72]

8. An allowance shall not be deducted in order to comply with the requirements under 40 CFR part 73, prior to the calendar year for which the allowance was allocated. [40 CFR 73]

9. An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or the written exemption under 40 CFR 72.7 and 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization. [40 CFR 72]

10. An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right. [40 CFR 72]

11. The owners and operators of each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides. [40 CFR 72]

12. The designated representative of an affected unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77. [40 CFR 77]

13. The owners and operators of an affected unit that has excess emissions in any calendar year shall: (i) Pay without demand the penalty required, and pay up on demand the interest on that penalty; and (ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77. [40 CFR 77]

14. The owners and operators of the each affected unit at the source shall keep on site the following documents for a period of five years from the date the document is created. This period may be extended for cause, at any time prior to the end of five years, in writing by the Administrator or

permitting authority: (i) The certificate of representation for the designated representative for the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site beyond such five-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative. [40 CFR 72]

15. The owners and operators of each affected unit at the source shall keep on site each of the following documents for a period of five years from the date the document is created. (i) This period may be extended for cause, at any time prior to the end of five years, in writing by the Administrator or permitting authority; (ii) All emissions monitoring information, in accordance with 40 CFR part 75; (iii) Copies of all reports, compliance certifications and other submissions and all records made or required under the Acid Rain Program; (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission that demonstrates compliance with the requirements of the Acid Rain Program. [40 CFR 75]

16. The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR 75 Subpart I. [40 CFR 75]

Verification: The project owner shall submit to the CPM and District the CTG annual operating data and NOx emissions limitation information demonstrating compliance with all applicable provisions of 40 CFR 72 as part of the Quarterly Operation Reports (**AQ-68**). The project owner shall maintain the documents in accordance with 40 CFR 72.24 on site and made available to district personnel upon request. The project owner/operator shall submit to the CPM copies of the Title IV permit and proof that necessary emission allowances~~allotments~~ have been acquired at least 15 days prior to the initial firing of the turbine(s). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-~~42~~76 Disturbances of soil related to any construction, demolition, excavation, extraction, or ~~water mining~~ other earthmoving activities shall comply with the requirements for fugitive dust control in ~~SJVAPCD~~ District Rule 8021~~0~~ ~~(4/25/96),~~ unless specifically exempted under S~~s~~ection 4.0 of Rule 8021~~0~~ or Rule 8011. [District Rules ~~8020~~8011 and 8021]

Verification: The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Commission to determine if adequate measures to control fugitive dust emissions are in place.

AQ-77 An owner/operator shall submit a Dust Control Plan to the APCO prior to the start of any construction activity on any site that will include 10 acres or more of disturbed surface area for residential developments, or 5 acres or more of disturbed surface area for non-residential development, or will include moving,

depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least three days. [District Rules 8011 and 8021]

Verification: The project owner shall provide a Dust Control Plan to the APCO and CPM at least 60 days prior to the start of any construction activity required in this condition.

AQ-78 An owner/operator shall prevent or cleanup any carryout or trackout in accordance with the requirements of District Rule 8041 Section 5.0, unless specifically exempted under Section 4.0 of Rule 8041 (8/19/04) or Rule 8011(8/19/04). [District Rules 8011 and 8021]

Verification: The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Commission to determine if adequate measures to control fugitive dust emissions are in place.

AQ-79 Whenever open areas are disturbed, or vehicles are used in open areas, the facility shall comply with the requirements of Section 5.0 of District Rule 8051, unless specifically exempted under Section 4.0 of Rule 8051 or Rule 8011. [District Rules 8011 and 8051]

Verification: The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Commission to determine if adequate measures to control fugitive dust emissions are in place.

AQ-~~44~~80 Any paved road ~~over three miles in length, and any~~ or unpaved roads ~~over 0.5 miles in length, constructed after December 10, 1993~~ shall ~~use the design criteria and dust control measures of, and~~ comply with the ~~administrative~~ requirements of ~~SJVAPCD~~ District Rule 806~~1~~0 unless specifically exempted under S~~s~~ection 4.0 of Rule 806~~1~~0 or Rule 8011. [District Rules ~~8030~~ 8011 and 8061]

~~**Verification:**~~ The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Commission ~~to determine if the width of paved shoulders on paved roads (three miles or greater) is sufficient and if chemical suppressants on unpaved roads (0.5 miles or greater), shoulders and medians is being used as required by Rule 8060~~.

AQ-81 Water, gravel, roadmix, or chemical/organic dust stabilizers/suppressants, vegetative materials, or other District-approved control measure shall be applied to unpaved vehicle travel areas as required to limit Visible Dust Emissions to 20 percent opacity and comply with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011. [District Rules 8011 and 8071]

Verification: The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Commission to determine if adequate measures to control fugitive dust emissions are in place.

AQ-82 Where dusting materials are allowed to accumulate on paved surfaces, the accumulation shall be removed daily or water and/or chemical/organic dust

stabilizers/suppressants shall be applied to the paved surface as required to maintain continuous compliance with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011 and limit Visible Dust Emissions (VDE) to 20 percent opacity. [District Rules 8011 and 8071]

Verification: The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Commission to determine if adequate measures to control fugitive dust emissions are in place.

AQ-83 On each day that 50 or more Vehicle Daily Trips or 25 or more Vehicle Daily Trips with 3 axles or more will occur on an unpaved vehicle/equipment traffic area, project owner shall apply water, gravel, roadmix, or chemical/organic dust stabilizers/suppressants, vegetative materials, or other District-approved control measure as required to limit Visible Dust Emissions to 20 percent opacity and comply with the requirements for a stabilized unpaved road as defined in Section 3.59 of District Rule 8011. [District Rules 8011 and 8071]

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

AQ-84 Whenever any portion of the site becomes inactive, Project owner shall restrict access and periodically stabilize any disturbed surface to comply with the conditions for a stabilized surface as defined in Section 3.58 of District Rule 8011. [District Rules 8011 and 8071]

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

AQ-85 Records and other supporting documentation shall be maintained as required to demonstrate compliance with the requirements of the rules under Regulation VIII only for those days that a control measure was implemented. Such records shall include the type of control measure(s) used, the location and extent of coverage, and the date, amount, and frequency of application of dust suppressant, manufacturer's dust suppressant product information sheet that identifies the name of the dust suppressant and application instructions. Records shall be kept for one year following project completion that results in the termination of all dust generating activities. [District Rules 8011, 8031, and 8071]

Verification: The project owner shall make the records required under this condition available for inspection by representatives of the District, ARB and the Energy Commission.

Equipment Description, UNIT C-3929-4-3:
Modification of 471 hp Caterpillar model #3456 DI TA AA diesel-fired emergency standby IC engine powering an electrical generator: reduce the annual hours of operation for maintenance and testing purposes from 200 hours/year to 50 hours/year

AQ-4~~8~~86 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-~~50~~87 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20 percent opacity. [District Rule 4101]

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

AQ-~~49~~88 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner/operator shall compile required data and submit the information to the CPM in quarterly report submitted no later than sixty (60) days after the end of each calendar year.

AQ-~~53~~89 ~~NOx emissions shall not exceed 5.09 g/hp-hr.~~ Emissions from this IC engine shall not exceed any of the following limits: 4.69 g-NO_X/bhp-hr, 0.12 g-CO/bhp-hr, or 0.04 g-VOC/bhp-hr. [District Rules 2201 and 13 CCR 2423 and 17 CCR 93115]

Verification: The project owner/operator shall provide records of compliance for the above condition as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~54~~90 ~~PM10 emissions shall not exceed 0.13 g/hp-hr.~~ Emissions from this IC engine shall not exceed 0.029 g-PM10/bhp-hr based on U.S.EPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 13 CCR 2423 and 17 CCR 93115]

Verification: The project owner/operator shall provide records of compliance for the above condition as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-~~56~~91 ~~The sulfur content of the diesel fuel used shall not exceed 0.05% by weight.~~ Only ARB certified diesel fuel containing not more than 0.0015 percent sulfur by weight is to be used. [District ~~NSR~~ Rules 2201 and 4801 and 17 CCR 93115]

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

AQ-92 This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rule 4702]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission. The project owner shall submit elapsed time in hours in the quarterly report of Condition **AQ-68**,

AQ-~~51~~93 T~~he~~his engine shall be equipped with either a positive crankcase ventilation (PCV) system which recirculates crankcase emissions into the air intake system for combustion, or a crankcase emissions control device of at least 90 percent control efficiency. [District ~~NSR~~ Rule 2201]

Verification: The project owner /operator shall make the site available for inspection by representative of the District, ARB and the Energy Emission.

AQ-94 The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]

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

AQ-~~55~~95 T~~he~~his engine shall be operated only for ~~maintenance,~~ testing and maintenance of the engine, required regulatory purposes, and during emergency situations. Operation of the engine for maintenance, testing, and required regulatory purposes shall not exceed 50 hours per year. [District Rule 4702 and 17 CCR 93115]

Verification: The project owner/operator shall provide records of compliance for the above condition as part of the Quarterly Operation Reports~~quarterly reports of Condition~~ (**AQ-~~31~~68**).

AQ-96 During periods of operation for maintenance, testing, and required regulatory purposes, the project owner shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [District Rule 4702]

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

AQ-97 An emergency situation is an unscheduled electrical power outage by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the project owner. [District Rule 4702]

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

AQ-98 This engine shall not be used to produce power for the electrical distribution system, as part of a voluntary utility demand reduction program, or for an interruptible power contract. [District Rule 4702]

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

AQ-~~57~~99 The ~~permittee~~ project owner shall maintain monthly records of ~~hours of~~ emergency and non-emergency operation. Records shall include ~~the date,~~ the

number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, and the purpose of the operation (~~e.g.,~~for example: load testing, weekly testing, rolling blackout, general area power outage, etc.).~~, and the sulfur content of the diesel fuel used. Such records shall be retained on-site for a period of two (2) years and made available for District inspection upon request.~~ For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]

~~Verification:~~ The project owner/operator shall make records available for inspection by representatives of the District, ARB and the Energy Commission upon request. ~~Records shall be retained for a period of two (2) years.~~

AQ-100 All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702 and 17 CCR 93115]

Verification: The project owner shall maintain all the records on site and made available to district personnel upon request. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

Equipment Description, UNIT C-3929-5-0:
42.0 MMBtu/hr Rentech Model RTD-2-60, or equivalent, natural gas-fired boiler with a COEN model C-RMB, or equivalent, ultra low-NOx burner, and a fuel gas recirculation system.

AQ-101 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-102 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20 percent opacity. [District Rule 4101]

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

AQ-103 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner/operator shall compile required data and submit the information to the CPM in quarterly report submitted no later than sixty (60) days after the end of each calendar year.

AQ-104 The project owner shall obtain written District approval for the use of any equivalent equipment not specifically approved by this Authority to Construct. Approval of the equivalent equipment shall be made only after the District's determination that the submitted design and performance of the proposed

alternate equipment is equivalent to the specifically authorized equipment. [District Rule 4201]

Verification: The project owner shall submit to the CPM copies of the written District approval within five working days of its submittal by the project owner to the District.

AQ-105 The project owner's request for approval of equivalent equipment shall include the make, model, manufacturer's maximum rating, manufacturer's guaranteed emission rates, equipment drawing(s), and operational characteristics/parameters. [District Rule 2201]

Verification: The project owner shall submit to the CPM copies of the written District approval within five working days of its submittal by the project owner to the District.

AQ-106 Alternate equipment shall be of the same class and category of source as the equipment authorized by the Authority to Construct. [District Rule 2201]

Verification: The project owner shall provide written approval of alternate equipment as required by **AQ-104**.

AQ-107 No emission factor and no emission shall be greater for the alternative equipment than for the proposed equipment. No changes in the hours of operation, operating rate, throughput, or firing rate may be authorized for any alternate equipment. [District Rule 2201]

Verification: The project owner shall provide written approval of alternate equipment as required by **AQ-104**.

AQ-108 All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emission of air contaminants into the atmosphere. [District Rule 2201]

Verification: Upon request, the project owner/operator shall make all maintenance records and report available at the project site to representatives of the District, ARB, EPA and the Energy Commission for inspection.

AQ-109 The flue gas recirculation (FGR) system shall be properly operated and shall be maintained per the manufacturer's recommendations. [District Rule 2201]

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

AQ-110 A non resettable, totalizing mass or volumetric fuel flow meter to measure the amount of fuel combusted in the unit shall be installed, utilized and maintained. [District Rules 2201 and 40 CFR 60.48(c)(g)]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission. The project owner shall submit fuel use records in the Quarterly Operation Reports (**AQ-68**).

AQ-111 The boiler shall operate a maximum of 4,000 hours per calendar year. [District Rule 2201]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission. The project owner shall submit operating hour data in the Quarterly Operation Reports (**AQ-68**).

AQ-112 This unit shall exclusively burn only PUC-regulated natural gas with a sulfur content no greater than 0.25 grains of sulfur compounds (as S) per 100 dry scf of natural gas. [District Rule 2201]

Verification: The project owner shall submit fuel sulfur content data as required under **AQ-48**.

AQ-113 Emissions from the exhaust of this boiler shall not exceed any of the following limits: 6 ppmvd NOx @ 3 percent O_2 or 0.0073 lb-NOx/MMBtu; 50 ppmvd CO @ 3 percent O_2 or 0.037 lb-CO/MMBtu; 0.005 lb-VOC/MMBtu; 0.0076 lb-PM10/MMBtu; or 0.0007 lb-SOx/MMBtu. [District Rules 2201, 4305, 4306, 4320 and 4351]

Verification: The project owner/operator shall provide records of compliance for the above condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-114 All emissions measurements shall be made with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. No determination of compliance shall be established within two hours after a continuous period in which fuel flow to the unit is shut off for 30 minutes or longer, or within 30 minutes after a re-ignition as defined in Section 3.0 of District Rule 4306. [District Rules 2201, 4305, 4306, 4320 and 4351]

Verification: The project owner/operator shall provide records of compliance for the above condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-115 Source testing to measure NOx and CO emissions from this unit while fired on natural gas shall be conducted within 60 days of initial start-up. [District Rules 2201, 4305, 4306 and 4320]

Verification: The results and field data collected during source tests required by this condition shall be submitted to the CPM for review and the District for approval within 60 days of testing.

AQ-116 Source testing to measure NOx and CO emissions from this unit while fired on natural gas shall be conducted at least once every twelve (12) months. After demonstrating compliance on two (2) consecutive annual source tests, the unit shall be tested not less than once every thirty-six (36) months. If the result of the 36-month source test demonstrates that the unit does not meet the applicable emission limits, the source testing frequency shall revert to at least once every twelve (12) months. [District Rules 4305, 4306, and 4320]

Verification: The results and field data collected during source tests required by this condition shall be submitted to the CPM for review and the District for approval within 60 days of testing.

AQ-117 Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081]

Verification: The project owner/operator shall notify the CPM and the District thirty (30) days prior to any compliance source test. The project owner/operator shall provide a source test plan to the CPM and District for the CPM and District approval fifteen (15) days prior to testing.

AQ-118 The source test plan shall identify which basis (ppmv or lb/MMBtu) will be used to demonstrate compliance. [District Rules 4305, 4306 and 4320]

Verification: The project owner/operator shall provide a source test plan to the CPM and District for the CPM and District approval fifteen (15) days prior to testing.

AQ-119 For emissions source testing, the arithmetic average of three 30-consecutive-minute test runs shall apply. If two or three runs are above an applicable limit the test cannot be used to demonstrate compliance with an applicable limit. [District Rules 4305, 4306 and 4320]

Verification: The results and field data collected during source tests required by this condition shall be submitted to the CPM for review and the District for approval within 60 days of testing.

AQ-120 NOx emissions for source test purposes shall be determined using EPA Method 7E or ARB Method 100 on a ppmv basis, or EPA Method 19 on a heat input basis. [District Rules 4305, 4306 and 4320]

Verification: The results and field data collected during source tests required by this condition shall be submitted to the CPM for review and the District for approval within 60 days of testing.

AQ-121 CO emissions for source test purposes shall be determined using EPA Method 10 or ARB Method 100. [District Rules 4305, 4306 and 4320]

Verification: The results and field data collected during source tests required by this condition shall be submitted to the CPM for review and the District for approval within 60 days of testing.

AQ-122 Stack gas oxygen (O_2) shall be determined using EPA Method 3 or 3A or ARB Method 100. [District Rules 4305, 4306 and 4320]

Verification: The results and field data collected during source tests required by this condition shall be submitted to the CPM for review and the District for approval within 60 days of testing.

AQ-123 Testing to demonstrate compliance with the fuel sulfur content limit shall be conducted weekly. Once eight consecutive weekly tests show compliance, the fuel sulfur content testing frequency may be reduced to once every calendar quarter. If a quarterly test shows a violation of the sulfur content limit then the weekly testing shall resume and continue until eight consecutive tests show

compliance. Once compliance is shown on eight consecutive weekly tests then testing may return to quarterly. [District Rules 2201 and 4320]

Verification: The project owner shall submit fuel sulfur content data as required under **AQ-48**.

AQ-124 Fuel sulfur content shall be monitored using one of the following methods: ASTM Methods D1072, D3246, D4084, D4468, D8410, D6228, D6667 or Gas Processors Association Standard 2377. [District Rule 2201]

Verification: The project owner shall submit fuel sulfur content data as required under **AQ-48**.

AQ-125 The exhaust stack shall either be equipped with a continuous emissions monitor (CEM) for NOx, CO, and O_2 or the committee shall implement one of the alternative monitoring schemes (A, B, C, D, E, F, or G) listed in District Rule 4320, Section 5.7.1 (dated 10/16/08). The project owner shall submit, in writing, the chosen method of monitoring (either CEMS or chosen alternate monitoring scheme) at least 30 days prior to initial operation of this boiler. [District Rules 2201, 4305, 4306 and 4320]

Verification: The project owner shall provide in writing to the District and CPM the chosen monitoring scheme for the boiler at least 30 days prior to initial operation. The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Energy Commission.

AQ-126 The project owner shall maintain daily records of the type, higher heating value (hhv) and quantity of fuel combusted by the boiler. [District Rules 2201 and 40 CFR 60.48(c)(g)]

Verification: The project owner shall submit fuel use records in the Quarterly Operation Reports (**AQ-68**). The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Energy Commission.

AQ-127 The project owner shall keep a record of the cumulative annual quantity of hours operated for this unit. The record shall be updated at least monthly. [District Rule 2201]

Verification: The project owner shall submit operating hour data in the Quarterly Operation Reports (**AQ-68**). The project owner/operator shall make the site available for inspection by representatives of the District, ARB and the Energy Commission.

AQ-128 All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rules 1070, 4305, 4306, and 4320]

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

Equipment Description, UNIT C-3929-6-0:

460 bhp Cummins Model CFP15E-F10 Tier 3 certified diesel-fired emergency internal combustion (IC) engine powering a firewater pump.

AQ-129 No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]

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

AQ-130 No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20 percent opacity. [District Rule 4101]

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

AQ-131 Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201]

Verification: The project owner/operator shall compile required data and submit the information to the CPM in quarterly report submitted no later than sixty (60) days after the end of each calendar year.

AQ-132 Emissions from this IC engine shall not exceed any of the following limits: 2.66 g-NOx/bhp-hr, 0.671 g-CO/bhp-hr, or 0.086 g-VOC/bhp-hr. [District Rules 2201 and 13 CCR 2423 and 17 CCR 93115]

Verification: The project owner/operator shall provide records of compliance for the above condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-133 Emissions from this IC engine shall not exceed 0.078 g-PM10/bhp-hr based on U.S.EPA certification using ISO 8178 test procedure. [District Rules 2201 and 4102 and 13 CCR 2423 and 17 CCR 93115]

Verification: The project owner/operator shall provide records of compliance for the above condition as part of the Quarterly Operation Reports (**AQ-68**).

AQ-134 Only CARB certified diesel fuel containing not more than 0.0015 percent sulfur by weight is to be used. [District Rules 2201 and 4801 and 17 CCR 93115]

Verification: The project owner shall submit the quarterly fuel sulfur content values in the in the Quarterly Operation Reports (**AQ-68**) and shall document all emissions standard violation in each Quarterly Operation Report. The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-135 This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO approved alternative. [District Rules 2201, 4305, 4306 and 4320]

Verification: The project owner shall make the site available for inspection by representatives of the District, ARB, and the Commission. The project owner shall submit elapsed time in hours in the Quarterly Operation Reports (**AQ-68**).

AQ-136 This engine shall be equipped with either a positive crankcase ventilation (PCV) system which recirculates crankcase emissions into the air intake system for combustion, or a crankcase emission control device of at least 90 percent control efficiency. [District Rules 2201]

Verification: The project owner /operator shall make the site available for inspection by representative of the District, ARB and the Energy Emission.

AQ-137 The exhaust stack shall vent vertically upward. The vertical exhaust flow shall not be impeded by a rain cap, roof overhang, or any other obstruction. [District Rule 4102]

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

AQ-138 This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer or emissions control system supplier. [40 CFR 60.4211(a)]

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

AQ-139 During periods of operation for maintenance, testing, and required regulatory purposes, the project owner shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier). [40 CFR 60.4211(a)]

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

AQ-140 This engine shall be operated only for testing and maintenance of the engine, required regulatory purposes, and during emergency situations. For testing purposes, the engine shall only be operated the number of hours necessary to comply with the testing requirements of the National Fire Protection Association (NFPA) 25 – "Standard for the Inspection, Testing, and Maintenance if Water-Based Fire Protection Systems", 1998 edition. Total hours of operation for all maintenance, testing, and required regulatory purposes shall not exceed 100 hours per calendar year. [District Rule 4702 and 17 CCR 93115]

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

AQ-141 An emergency situation is an unscheduled event caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the project owner. [District Rule 4702]

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

AQ-142 The project owner shall maintain monthly records of emergency and non-emergency operation. Records shall include the number of hours of emergency operation, the date and number of hours of all testing and maintenance operations, and the purposed of the operation (for example: load testing, weekly testing, emergency fire fighting use, etc.). For units with automated testing systems, the operator may, as an alternative to keeping records of actual operation for testing purposes, maintain a readily accessible written record of the automated testing schedule. [District Rule 4702 and 17 CCR 93115]

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

AQ-143 All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request. [District Rule 4702 and 17 CCR 93115]

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

DELETED CONDITIONS

Staff Conditions

~~**AQ-C1** Prior to breaking ground at the project site, the project owner shall prepare a Construction Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed for construction activities at the Henrietta Peaker Project site and related facilities.~~

~~The Construction Fugitive Dust Mitigation Plan shall specifically identify measures to limit fugitive dust emissions from construction of the project site and linear facilities. Measures that should be addressed include the following:~~

~~the identification of the employee parking area(s) and surface of the parking area(s);~~

~~the frequency of watering of unpaved roads and disturbed areas;~~

~~the application of chemical dust suppressants;~~

~~the use of gravel in high traffic areas;~~

~~the use of paved access aprons;~~

~~the use of sandbags to prevent run off;~~

~~the use of posted speed limit signs limiting speed to 10 MPH;~~

~~the use of wheel washing areas prior to large trucks leaving the project site;~~

~~the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads;~~

~~the use of windbreaks at appropriate locations;~~

~~the suspension of all earth moving activities under windy conditions; and,~~

~~the use of on-site monitoring devices.~~

~~**Verification:** At least sixty (60) days prior to breaking ground at the project site, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with a copy of the Construction Fugitive Dust Mitigation Plan for approval.~~

~~**AQ-C2** The project owner shall mitigate, to the extent practical, construction related emission impacts from off-road, diesel-fired construction equipment. Available measures that may be used to mitigate construction impacts include the following:~~

~~Catalyzed Diesel Particulate Filters (CDPF);~~

~~Ultra-Low-Sulfur Diesel fuel, with a sulfur content of 15 ppm or less(ULSD);~~

~~Diesel engines certified to EPA and CARB 1996 or newer off-road equipment emission standards.~~

~~Additionally, the project owner shall restrict idle time, to the extent practical, to no more than 10 minutes.~~

~~The use of each mitigation measure is to be determined in advance by a Construction Mitigation Manager (CMM), who will be available at the project site(s). The CMM must be approved by the CPM prior to the submission of any reports.~~

~~The CMM shall submit the following reports to the CPM for approval:~~

~~Construction Mitigation Plan~~

~~Reports of Change and Mitigation Implementation~~

~~Reports of Emergency Termination of Mitigation, as necessary~~

~~**Diesel Construction Equipment Mitigation Plan:**~~

~~The Construction Mitigation Plan shall be submitted to the CPM for approval prior to rough grading on the project site, and must include the following:~~

~~A list of all diesel fueled, off-road, stationary or portable construction-related equipment to be used either on the project construction site or the construction sites of the related linear facilities. Equipment used less than a total of 10 consecutive days need not be included in this list.~~

~~Each piece of construction equipment listed under item (1) must demonstrate compliance with the following mitigation requirements:~~

~~Engine Size (BHP)~~	~~1996 CARB or EPA Certified Engine~~	~~Required Mitigation~~
~~< or =100~~	~~Yes or No~~	~~ULSD~~
~~>100~~	~~Yes~~	~~ULSD~~
~~>100~~	~~No~~	~~ULSD and CDPF, if suitable as determined by the CMM~~

~~If compliance cannot be demonstrated as specified under item (2), then the project owner may appeal for relief to the CPM. However, the owner must~~

~~demonstrate that they have made a good faith effort to comply as specified under item (2).~~

~~Report of Change and Mitigation Implementation~~

~~Following the initiation of construction activities, and if changes to mitigation measures are necessary, the CMM shall submit a Report of Change and Mitigation Implementation to the CPM for approval. This report must contain at a minimum the cause of any deviation from the Construction Mitigation Plan, and verification of any Construction Mitigation Plan measures that were implemented.~~
~~The following is acceptable proof of compliance; other methods of proof of compliance must be approved by the CPM.~~

- ~~EPA or CARB 1996 off-road equipment emission standards:~~
- ~~A copy of the certificate from EPA or CARB.~~
- ~~Purchase and use of ultra-low-sulfur fuel (15 ppm or less).~~
  - ~~Receipt or other documentation indicating type and amount of fuel purchased, from whom, where delivered and on what date; and~~
  - ~~A copy of the text included in the contract agreement with all contractors and sub-contractors for use of the ultra-low-sulfur fuel in diesel burning construction equipment as identified in the Construction Mitigation Plan.~~
- ~~Installation of CDPF:~~
  - ~~The suitability of the use of CDPFs is to be determined by a qualified mechanic or engineer who must submit a report to the CPM for approval.~~
  - ~~Installation is to be verified by a qualified mechanic or engineer.~~
- ~~Construction equipment engine idle time:~~
  - ~~A copy of the text included in the contract agreement with all contractors and sub-contractors to keep engine idle time to 10 minutes or less to the extent practical.~~

~~Report of Emergency Termination of Mitigation~~

~~If a specific mitigation measure is determined to be detrimental to a piece of construction equipment or is determined to be causing significant delays in the construction schedule of the project or the associated linear facilities, the mitigation measure may be terminated immediately. However, notification containing an explanation for the cause of the termination must be sent to the CPM for approval. All such causes are restricted to one of the following justifications and must be identified in any Report of Emergency Termination of Mitigation.~~

- ~~The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or power output due to an excessive increase in back pressure.~~
- ~~The measure is causing or is reasonably expected to cause significant engine damage.~~

~~The measure is causing or is reasonably expected to cause a significant risk to nearby workers or the public.~~

~~Any other seriously detrimental cause which has approval by the CPM prior to the change being implemented.~~

~~**Verification:** The project owner will submit to the CPM for approval the qualifications of the CMM at least 45 days prior to the due date for the Diesel Construction Equipment Mitigation Plan. The project owner will submit the Diesel Construction Equipment Mitigation Plan to the CPM for approval 30 calendar days prior to rough grading on the project site or start of construction on any associated linear facilities. The project owner will submit the Report of Change and Mitigation Implementation to the CPM for approval no later than 10 working days following the use of the specific construction equipment on either the project site or the associated linear facilities. The project owner will submit a Report of Emergency Termination of Mitigation to the CPM for approval, as required, no later than 10 working days following the termination of the identified mitigation measure. The CPM will monitor the approval of all reports submitted by the project owner in consultation with CARB, limiting the review time for any one report to no more than 20 working days.~~

~~**AQ-C3** The project owner shall surrender to the District emission reduction credits in the following amounts to mitigate project emissions:~~

	~~Required ERCs after application of offset ratios (lbs/quarter)~~			
~~Pollutant~~	~~1st Quarter~~	~~2nd Quarter~~	~~3rd Quarter~~	~~4th Quarter~~
~~NO_x~~	~~19,370~~	~~20,140~~	~~20,140~~	~~19,370~~
~~PM10~~	~~13,200~~	~~13,200~~	~~13,200~~	~~13,200~~
~~VOC~~	~~1,388~~	~~1,456~~	~~1,456~~	~~1,388~~
~~SO_2~~	~~1,320~~	~~1,320~~	~~1,320~~	~~1,320~~

~~This condition serves to replace the ERC requirements listed in District condition AQ-2, by adding the additional CEQA mitigation proposed by the Applicant for PM10, VOC and SO_2. The values listed above are discounted for distance offset ratios required by Rule 2201, assume Rule 2201 allowed inter-quarter transfers, and assume a total SO_2 for PM10 distance/interpollutant offset ratio of 1.9:1.~~

~~**Verification:** At least 5 days prior to commencing construction, the project owner shall provide to the CPM a copy of the documentation from the District proving that the required emission reduction credits have been surrendered.~~

District Conditions

Gas Turbine Conditions

~~**AQ-2** Upon implementation of C-3929-1-0 and C-3929-2-0, emission offsets shall be provided to offset emissions increases in the following amounts:~~

~~PM_{10} - Q1: 700 lb, Q2: 700 lb, Q3: 700 lb, and Q4: 700 lb and NO_x (as NO_2) - Q1: 29,055 lb, Q2: 30,210 lb, Q3: 30, 210 lb, and Q4: 29,055 lb. Offsets shall be provided at the appropriate offset ratio specified in Rule 2201 Section 4.2.4. SO_x offsets provided to offset PM_{10} increases shall be at a ratio of 1.4:1 at the appropriate distance ratio. [District Rule 2201] This Determination of Compliance~~

~~serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201]~~

~~**Verification:** The project owner/operator shall submit copies of ERCs surrendered to the SJVAPCD in the amounts shown above to the CPM prior to initiation of project construction.~~

~~**AQ-3** The permittee shall notify the District of the date of initiation of construction no later than 30 days after such date, the date of anticipated startup not more than 60 days nor less than 30 days prior to such date, and the date of actual startup within 15 days after such date. [District Rule 4001]~~

~~**Verification:** The project owner/operator shall notify the CPM and the District of the date of initiation of construction no later than 30 days after such date, the date of anticipated startup not more than 60 days or less than 30 days prior to such date, and the date of actual startup within 15 days after such date.~~

~~**AQ-13** Operation of the turbine shall not exceed 8,000 hours per calendar year. [District Rule 2201]~~

~~**Verification:** The project owner/operator shall provide records of compliance as part of the quarterly reports of Condition **AQ-31**.~~

~~**AQ-27** Source testing to determine the percent efficiency of the turbine shall be within 60 days of initial operation and at least once every twelve months thereafter. [District Rule 4703]~~

~~**Verification:** The results and field data collected during source tests shall be submitted to the CPM and the District within 60 days of testing. Testing shall be conducted within 60 days of initial operation of each CTG and at least once every twelve months.~~

~~**AQ-30** Source testing to determine the percent efficiency of the turbine shall be conducted utilizing the procedures in District Rule 4703 (Stationary Gas Turbines). [District Rule 4703]~~

~~**Verification:** The project owner/operator shall provide records of compliance as part of Condition **AQ-28**.~~

~~**AQ-33** Results of continuous emissions monitoring shall be reduced according to the procedures established in 40 CFR, Part 51, Appendix P, paragraphs 5.0 through 5.3.3, or by other methods deemed equivalent by mutual agreement with the District, the ARB, and the EPA. [District Rule 1080]~~

~~**Verification:** The project owner/operator shall compile the required data in the formats discussed above and submit the results to the CPM quarterly.~~

~~**AQ-43** Outdoor handling and storage of any bulk material which emits dust shall comply with the requirements of SJVAPCD Rule 8030 (4/25/96), unless specifically exempted under section 4.0 of Rule 8030. [District Rule 8030]~~

~~**Verification:** The project owner/operator shall make the site available for inspection by representatives of the District, CARB and the Commission to determine if adequate measures to control bulk materials fugitive dust emissions are in place.~~

~~**AQ-45** The owner/operator shall insure that all areas of one (1) acre or greater, which are used for vehicle and/or equipment parking, fueling and service, shipping, receiving and transfer, comply with the requirements of District Rule 8070 (4/25/96), unless specifically exempted under section 3.0 of this rule. All areas used for storage of construction vehicles, equipment, and material shall comply with the provision of District Rule 8070. [District Rules 8020 and 8070]~~

~~**Verification:** The project owner/operator shall make the site available for inspection by representatives of the District, CARB and the Commission to determine if adequate measures to control fugitive dust emissions from all unpaved areas one acre or greater, which are used for parking, fueling, service, shipping, receiving and transfer, are in place as required by Rule 8070.~~

~~**AQ-46** The facility shall be subject to any revised Regulation VIII rule requirements if the modifications are contrary to the conditions in the FDOC (SJVAPCD 2001a). The facility shall be subject to the revised rule as of the date that each rule is adopted. [District Rule 2201]~~

~~**Verification:** The project owner/operator shall maintain records of modifications to Regulation VIII rules as necessary.~~

Emergency Engine Conditions

~~**AQ-47** All equipment shall be maintained in good operating condition and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere. [District NSR Rule]~~

~~**Verification:** project owner/operator shall make the site and maintenance records available for inspection by representatives of the District, CARB and the Commission.~~

~~**AQ-52** The exhaust stack shall not be fitted with a rain cap, or any other similar device, that impedes vertical exhaust flow. [District Rule 4102]~~

~~**Verification:** The project owner/operator shall make the site available for inspection by representatives of the District, CARB and the Commission.~~

ACRONYMS

AADT	Annual Average Daily Trips
AAQS	Ambient Air Quality Standard
ACC	Air Cooled Condenser
AERMOD	ARMS/EPA Regulatory Model
AER	Actual Emission Reduction
AFC	Application for Certification
APCO	Air Pollution Control Officer
AQCMM	Air Quality Construction Mitigation Manager
AQCMP	Air Quality Construction Mitigation Plan
ARB	California Air Resources Board
ASTM	American Society for Testing and Materials
ATC	Authority to Construct
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
bhp	brake horsepower
Btu	British thermal unit
CCR	California Code of Regulation
CEC	California Energy Commission (or Energy Commission)
CEMS	Continuous Emission Monitoring System
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COCs	Conditions of Certification
CPM	(CEC) Compliance Project Manager
CTG	Combustion Turbine Generator
DOC	Determination of Compliance
dscf	Dry Standard Cubic Feet
EIR	Environmental Impact Report
ERC	Emission Reduction Credit
FDOC	Final Determination Of Compliance
GE	General Electric
GHG	Greenhouse Gas
gpm	Gallon per minute
Gr	Grains (1 gr $\cong$ 0.0648 grams, 7000 gr = 1 pound)
GWF Henrietta	GWF Henrietta Combined-cycle Power Plant

hhv	Higher heating value
HPP	Henrietta Peaker Plant
H_2S	Hydrogen Sulfide
hp	Horsepower
HSC	Health and Safety Code
ICE	Internal Combustion Engine
ISC	Industrial Source Complex
kW	Kilowatts (1,000 watts)
lbs	Pounds
LORS	Laws, Ordinances, Regulations and Standards
MCR	Monthly Compliance Report
µg	Microgram
$\mu g/m^3$	Microgram per cubic meter
mg/m^3	Milligrams per cubic meter
MMBtu	Million British Thermal units
MW	Megawatts (1,000,000 Watts)
NAAQS	National Ambient Air Quality Standard
NFPA	National Fire Protection Association
NH_3	Ammonia
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen or Nitrogen Oxides
NSPS	New Source Performance Standard
NSR	New Source Review
O_2	Oxygen
O_3	Ozone
OLM	Ozone Limiting Method
OTSG	Once Through Steam Generator
PCV	Positive Crankcase Ventilation
PDOC	Preliminary Determination Of Compliance
PM	Particulate Matter
PM10	Particulate Matter less than 10 microns in diameter
PM2.5	Particulate Matter less than 2.5 microns in diameter
ppm	Parts Per Million
ppmv	Parts Per Million by Volume
ppmvd	Parts Per Million by Volume, Dry
PSA	Preliminary Staff Assessment (this document)
PSD	Prevention of Significant Deterioration

PTO	Permit to Operate
PUC	Public Utilities Commission
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RATA	Relative Accuracy Test Audit
scf	Standard Cubic Feet
SCR	Selective Catalytic Reduction
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	Sulfur Dioxide
SO_4	Sulfate
SOx	Oxides of Sulfur
STG	Steam Turbine Generator
TDS	Total Dissolved Solid
TFV	Thresholds Friction Velocity
U.S.EPA	United States Environmental Protection Agency
VDE	Visible Dust Emission
VOC	Volatile Organic Compounds
WSAC	Wet Surface Air Cooler

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AIR QUALITY APPENDIX AIR-1
GREENHOUSE GAS EMISSIONS

Testimony of William Walters, P.E. and Matthew Layton, P.E.

SUMMARY OF CONCLUSIONS

The GWF Henrietta Combined Cycle Power Plant Project (GWF Henrietta) is a proposed addition to the state's electricity system that would produce greenhouse gas (GHG) emissions while generating electricity for California consumers. GWF Henrietta would modify the existing Henrietta Peaker Plant (HPP) to create a dual-function natural gas-fired power plant capable of operating either in a simple-cycle mode, as it does today, or as a more-efficient combined cycle power plant. Its addition to the system would displace other less efficient generation and facilitate the integration of renewable resources. Because the project's emissions per megawatt-hour (MWh) would be lower than those of other power plants that the project would displace, the addition of GWF Henrietta would contribute to a reduction of the California and overall Western Electricity Coordinating Council system GHG[2] 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 project may be subject to additional reporting requirements and GHG reductions or trading requirements as these regulations are more fully developed and implemented.

On October 8, 2008, the Energy Commission adopted an order initiating an informational (OII) proceeding (08-GHG OII-1) to solicit comments on how to assess 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 concerning greenhouse gas emissions for this amendment case. Future power plant siting and amendment cases are likely to be reviewed with the benefit of new information and policy direction from the Energy Commission in response to the OII. This analysis recognizes that the "prudent use" of natural gas for electricity generation will serve to optimize the system (for integrating intermittent renewable generation and providing reliability), but, without further analysis and policy direction by the Energy Commission to refine this general understanding, this analysis leaves the implications for optimizing the system to future cases (CEC 2009a).

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

- GWF Henrietta would provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation.

[2] Fuel-use closely correlates to the efficiency of and 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, CO_2 and GHG are used interchangeably in this section.

- GWF Henrietta would displace some less efficient local generation in the dispatch order of gas-fired facilities that are required to provide electricity reliability in the Greater Fresno Area.
- GWF Henrietta 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 new Emission Performance Standard.
- GWF Henrietta could facilitate to some extent the replacement of generation provided by aging power plants that use once-through cooling.

The ability and magnitude to which GWF Henrietta would fulfill these roles are uncertain given that the project would be permitted to operate as a base load facility with an overall annual capacity factor of nearly 98 percent (GWF 2008a) but as of yet, does not have a power purchase contract that would specify how and when it would operate to achieve such a capacity factor. The energy displaced by the GWF Henrietta project would result in a reduction in GHG emissions from the electricity system, and the project would serve a role in optimizing the system by providing reliability to a major local reliability area, the Greater Fresno Area. 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 thus would 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.) that applies to utility purchases of base load power from power plants.

INTRODUCTION

Greenhouse gas (GHG) emissions are not criteria pollutants, but are discussed in the context of cumulative impacts. The state has demonstrated its intent to address global climate change though research, adaptation,[3] 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.

[3] 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).

GREENHOUSE GAS Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	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.	These ARB regulations implement 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.)
Title 20, California Code of Regulations, 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)

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 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[4] emissions as a condition of state licensing of new electric generating facilities (CEC 2003, IEPR p. 42). In 2006, California enacted the California Global Warming Solutions Act of 2006 (AB 32). It requires the 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.[5] 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. ARB staff is developing regulatory language to

[4] 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 term greenhouse gases (GHG) and global climate change (GCC) gases are used interchangeably.

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

implement its plan and holds ongoing public workshops on key elements of the recommended GHG reduction measures, including market mechanisms (ARB 2006). The regulations must 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 might pursue 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 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), 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 percent Renewables Portfolio Standard (RPS), aggressive energy efficiency targets, and a cap-and-trade system that includes the electricity sector (ARB 2008b).

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 percent reduction in GHG from the electricity sector, even though the sector currently only produces about 25 percent 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 should ARB decide that a multi-sector cap and trade system is warranted.

The Energy Commission's *2007 Integrated Energy Policy Report* (IEPR) also addresses climate change within the electricity, natural gas, and transportation sectors (CEC 2007). 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 percent Renewables Portfolio Standard.

SB 1368,[6] also enacted in 2006, and regulations adopted by the Energy Commission and the Public Utilities Commission pursuant to the bill, prohibits 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[7] (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.[8] If a

[6] Public Utilities Code § 8340 et seq.

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

[8] See Rule at http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm

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 units that operate at a capacity factor higher than 60 percent. As a project applying for the flexibility to operate in base load scenarios, if GWF Henrietta enters into a contract to sell base load electricity, GWF Henrietta would have to meet the SB 1368 EPS.

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.

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 reasonably 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

[9] See page CEC 2009b, page 95.

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 (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 GWF Henrietta would involve 15 months of activity. The project owner provided a GHG emission estimate for the entirety of the construction phase. The GHG emissions estimate, presented below in **GREENHOUSE GAS Table 2**, includes the total emissions for the 15 months of construction activity in terms of CO_2-equivalent.

GREENHOUSE GAS Table 2
GWF Henrietta, Estimated Potential Construction Greenhouse Gas Emissions

Construction Source	Construction-Phase GHG Emissions (MTCO2E) [a]
Onsite off-road equipment	1,551
Onsite on-road vehicle	7
Onsite Total	**1,558**
Offsite on-road vehicles	482
Construction Total	**2,040**

Source: GWF 2009a.
Notes:
a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms

OPERATIONS

The proposed GWF Henrietta would operate as both simple-cycle and combined-cycle power plant up to nearly 98 percent capacity annually. The two General Electric LM6000 gas turbines are fired with natural gas. The project would increase the thermal efficiency of the existing simple-cycle plant without sacrificing flexibility because the new

STG would use thermal energy that the existing pair of CTGs presently release to the atmosphere. Simple-cycle mode startups are based on the CTGs achieving a 10-minute cycle, and starting the STG in combined-cycle mode would take 60 minutes. This power plant configuration would be capable of achieving startups of less than 2 hours under all conditions (GWF 2008a).

The primary sources of GHG would be the existing, modified natural gas fired combustion turbines. There will also be a small amount of GHG emissions from the diesel fuel consumed in the new emergency fire pump engine, and sulfur hexafluoride emissions from electrical component equipment. Operation of natural gas fired auxiliary boiler would also result in GHG emissions. This project would increase employee vehicle trips to the existing Henrietta facility somewhat because it is presently operated remotely, but would have a permanent operating staff post conversion.

GREENHOUSE GAS Table 3 shows what the proposed project, as permitted, could potentially emit in greenhouse gases on an annual basis. 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 SF_6 containing equipment will be required for this project, and the leakage of SF_6 and its CO_2 equivalent emissions have been estimated.

GREENHOUSE GAS Table 3
GWF Henrietta, Estimated Potential Greenhouse Gas (GHG) Emissions

Emissions Source	**Operational GHG Emissions (MTCO2E/yr)** [a]
Stationary Gas Turbines with Combined-Cycle Modification (CTG/STG)	423,305
Auxiliary Boiler	8,949
Emergency Fire Pump	11
Existing Emergency Generator	11
Sulfur Hexafluoride (SF6) Leakage	16
Total Project GHG Emissions (MTCO2E/yr)	**432,292**
Estimated Annual Energy Output (MWh/yr) [b]	988,470
Estimated Annualized GHG Performance (MTCO2/MWh)	**0.44**
Estimated Annualized GHG Performance (MTCO2E/MWh)	**0.44**

Sources: GWF 2008a, CH2MHill 2009; including methane (CH_4) and nitrous oxide (N_2O); independent Energy Commission staff analysis for estimated energy output.
Notes:
a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
b. Annualized basis uses the project owner's assumed maximum operating basis of 1,458 hours per year in simple-cycle mode and 7,083 hours in combined-cycle mode, including startups and shutdowns.

The proposed project would be permitted, on an annual basis, to emit over 432,000 metric tonnes of CO_2-equivalent per year if operated at its maximum permitted level. The new GWF Henrietta combined cycle plant would be more efficient than the existing HPP that it would replace, which has a GHG performance of around 0.55 MTCO2/MWh. The proposed GWF Henrietta project in a combined-cycle mode for much of the year

would emit at 0.44 MTCO2/MWh, which would easily meet the limits of SB 1368 and the Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh. However, if the use of combined-cycle mode is less than expected, then the project's annual average efficiency would decrease, which would cause the actual GHG emissions to increase slightly per MWh. The annual CO_2 performance of GWF Henrietta would be highly dependent on the number of hours operating in combined-cycle mode, which would be dependent on power purchase contract terms that are not known at this time. The CO_2 emissions performance for each mode is around 0.52 MTCO2/MWh for simple-cycle mode, and 0.41 MTCO2/MWh for combined-cycle mode.

The proposed project would increase the available energy and capacity to the electricity system currently provided by the existing HPP. The Greater Fresno Area would benefit from the incremental increase in energy and capacity provided by GWF Henrietta. GWF Henrietta would provide local reliability support in the Fresno Local Reliability Area and could facilitate the retirement of less efficient power plants.

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 construction of the project. 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 construction and electricity sectors.

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 fossil-fueled generation resources to provide energy and satisfy local capacity needs. As directed by the OII (CEC 2009a), staff is refining and implementing the concept of a "blueprint" that describes the long-term role of fossil-fueled power plants in California's electricity system. 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). GWF Henrietta is analyzed here for its role in providing local capacity and generation 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 GHG emissions and the amount of natural gas used by electricity generation. As the *2007 Integrated Energy Policy Report* (CEC 2007, 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 GWF Henrietta project 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.20):

> 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 percent 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). GWF Henrietta, with its lower heat rate than the existing HPP that it would replace and most other dispatchable gas-fired generation in the state, would be more efficient and lower GHG-emitting than the existing fleet.

The Role of GWF Henrietta in Local Generation Displacement

The proposed GWF Henrietta project would have a net heat rate between 7,600 Btu/kWh[10] in combined-cycle mode and 10,400 Btu/kWh, which is the existing heat rate of HPP, depending on the frequency of combined-cycle operation. The heat rate, energy output, and GHG emissions of local generation resources near the HPP are listed in **GREENHOUSE GAS Table 4**. Compared to most other new and existing units in the Greater Fresno Area, including the existing HPP, GWF Henrietta would be more efficient, and emit fewer GHG emissions during any hour of operation. 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 2008 from the local units. However, dispatch order can change, or deviate from economic or efficiency dispatch, in any one year or due to other

[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.

concerns such as permit limits, contractual obligations, local reliability needs or emergencies. These deviations, however, are likely to occur infrequently.

Because GWF Henrietta is inside the Greater Fresno Area Local Capacity Area, it would be able to provide capacity during most system operating conditions.

GREENHOUSE GAS Table 4
Greater Fresno Area, Local Generation Heat Rates and 2008 Energy Outputs

Plant Name	Heat Rate (Btu/kWh) [a]	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
La Paloma Generating	7,172	6,185.2	0.380
Pastoria Energy Facility L.L.C.	7,032	4,900.9	0.373
Sunrise Power	7,266	3,604.9	0.385
Elk Hills Power, LLC	7,048	3,551.9	0.374
KRCD Malaga Peaking Plant	9,957	151.0	0.528
Hanford Energy Park Peaker	9,396	45.9	0.498
CalPeak Power – Panoche	10,376	7.0	0.550
Wellhead Power Gates, LLC [b]	12,305	4.6	0.652
Wellhead Power Panoche, LLC	13,716	2.7	0.727
MMC Mid-Sun, LLC	12,738	1.4	0.675
Fresno Cogen Partners, LP PKR	16,898	0.8	0.896
Existing Henrietta Peaker Plant (HPP)	10,351	48.1	0.549
Proposed GWF Henrietta (at permitted limit)	8,039	988 (max est.)	0.44

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER); with independent Energy Commission staff analysis for GWF Henrietta on annualized basis of 1,458 hours per year in simple-cycle mode and 7,083 hours in combined cycle mode, including startups and shutdowns.
Notes:
a. Based on the Higher Heating Value or HHV of the fuel.

The Role of GWF Henrietta in the Integration of Renewable Energy

As California moves towards an increased reliance on renewable energy, the bulk of renewable generation available to and used in California in the near to intermediate future 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, p. 14).

GWF Henrietta would provide flexible, dispatchable and fast ramping[11] power that would not obstruct penetration of renewable energy. In general, combustion turbines can ramp

[11] 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.

up quickly, but output of a large-scale combined cycle facility can be limited by the steam turbine to about 15 MW per minute.[12]

GWF Henrietta would also provide fast starting[13] capabilities by continuing the existing capability of HPP to operate in a simple-cycle mode. The existing CTGs would continue to have the ability of achieving a 10-minute startup cycle, and the proposed once-through steam generator and the STG would add generation capable of starting in 60 minutes. Intermittent renewable sources of energy would be accommodated by GWF Henrietta varying its energy output as needed to integrate the renewable sources, which enables GWF Henrietta to play a role in most system operating scenarios.[14]

The amount of dispatchable fossil fuel generation used as regulation resources, fast ramping resources, or load following or supplemental energy dispatches will have to be significantly increased due to the intermittent resources planned to meet the 20 percent RPS (CAISO 2007, p.113); the 33 percent RPS will require even more dispatchable generation to integrate the renewables. However, this does not suggest the existing and new fossil fuel capacity will operate more in terms of total generation, but will need to operate more in a supplementary rather than base load role. **GREENHOUSE GAS Table 5** shows how the build-out of either the 20 percent or the 33 percent RPS will affect generation from new and existing non-renewable resources. Should California reach its goal of meeting 33 percent 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 percent 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 current retail sales forecast.[15] If, for example, forecasted retail sales in 2020 were lowered by 10,000 GWh due to the success of increased energy efficiency expenditures, non-renewable energy needs fall by an additional 8,000 to 6,700 GWh/year, depending on whether 20 percent or 33 percent RPS is assumed, respectively.

The Role of GWF Henrietta in Retirements/Replacements

GWF Henrietta would be capable of annually providing 988 GWh of natural gas-fired generation energy to displace 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 high GHG-emitting, such as coal-fired

[12] Of the 2,821 MW of thermal resources providing Ancillary Services to the CAISO, most (2,441 MW) have ramp rates between 10 and 31 MW/min. The bulk of the resources providing Ancillary Services with ramp rates greater than 10 MW/min (7,141 MW) are hydroelectric facilities (ISO 2007).

[13] In general, fast starts are defined as being less than two hours.

[14] It is important to note that renewable generation is just one source of intermittency, or variability, that fast ramping plants can and do accommodate for in the California electric system, such as inaccurate load and weather forecasts, and unscheduled generation outages.

[15] The extent to which uncommitted energy efficiency savings are already represented in the current Energy Commission demand forecast is a subject of study for the 2009 IEPR.

generation, generation that relies on water for once-through cooling, and aging power plants (CEC 2007). 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.

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

California Electricity Supply	**Annual GWh**	
Statewide Retail Sales, 2008, estimated [a]	265,185	
Statewide Retail Sales, 2020, forecast [a]	308,070	
Growth in Retail Sales, 2008-20	42,885	
Growth in Net Energy for Load [b]	46,316	
California Renewable Electricity	**GWh @ 20% RPS**	**GWh @ 33% RPS**
Renewable Energy Requirements, 2020 [c]	61,614	101,663
Current Renewable Energy, 2008	29,174	
Change in Renewable Energy-2008 to 2020 [c]	32,440	72,489
Resulting Change in Non-Renewable Energy [d]	13,876	(-36,173)

Source: Energy Commission staff 2009.
Notes:
a. Not including 8 percent transmission and distribution losses.
b. Based on 8 percent transmission and distribution losses, or 42,885 GWh x 0.08 = 46,316 GWh.
c. Renewable standards are calculated on retail sales and not on total generation, which accounts for 8 percent transmission and distribution losses.
d. Based on net energy (including 8 percent transmission and distribution losses), not based on retail sales.

Replacement of High GHG-Emitting Generation

High GHG-emitting, such as coal-fired, resources are effectively prohibited from entering into new contracts for California deliveries as a result of the Emission 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[16], 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 due to the carbon adder or the capital needed to capture and sequester the carbon emissions. Also shown are approximately 500 MW of in-state coal and petroleum coke-fired capacity that may not be able to contract with California utilities due to the SB 1368 Emission Performance Standard. As these contracts expire, new and existing

[16] 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.

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 generally will emit significantly less GHG than the coal and petroleum coke-fired generation, which average about 1.0 MTCO2/MWh, or two times more than a natural gas-fired combined-cycle project like GWF Henrietta, 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 Emission 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 GWF Henrietta 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 cycles may well install dry or wet cooling towers, 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 displace the energy provided by OTC facilities and likely 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 statewide 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	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	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	Yes	1,332	180	0.673
Potrero 3	Merchant	S.F. Bay	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), currently under construction, enters commercial operation.

b. Units are aging but are not OTC.

New generation resources that can either provide local support or energy will emit significantly less GHGs than aging OTC plants whose generation they should partially displace. Existing aging and OTC natural gas generation average 0.6 to 0.7 MTCO2/MWh, which is less efficient, higher GHG emitting, than a new natural gas-fired combined-cycle project like GWF Henrietta. When a project can provide energy and capacity, depending on its location, it can provide a significant net reduction in GHG emissions from the California electricity sector. A project located in a coastal load

pocket, like the Greater Bay Area Local Capacity Area, would more likely provide local reliability support as well as facilitate the retirement of aging and/or OTC power plants to a degree that the GWF Henrietta project could not.

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 LORS

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. That regulatory approach may 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 this agency 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 should ARB decide that a multi-sector cap-and-trade system is warranted. As ARB codifies accurate 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.

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 GWF Henrietta project would not be subject to the SB 1368 Emission Performance Standard if it continues to operate as a peaker and does not exceed a 60 percent capacity factor. However, because the project would be permitted to operate as a base load facility exceeding a 60 percent capacity factor, it must be and would be capable of complying with the EPS in SB 1368, as long as it operates some reasonable fraction of the time in combined-cycle mode.

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 GWF Henrietta would have an impact upon the overall electricity system operation and GHG emissions in several ways:

- GWF Henrietta would provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation.
- GWF Henrietta would displace some less efficient local generation in the dispatch order of gas-fired facilities that are required to provide electricity reliability in the Greater Fresno Area.
- GWF Henrietta 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 new Emission Performance Standard.
- GWF Henrietta could facilitate to some extent the replacement of generation provided by aging power plants that use 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, 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 GWF Henrietta project would result in a reduction in GHG emissions from the electricity system. In other system roles, as described in **GREENHOUSE GAS Table 8**, GWF Henrietta would minimize its GHG impacts by filling nearly all of the expected future roles for gas-fired generation, in a high-renewables, low-GHG system.

GREENHOUSE GAS Table 8
GWF Henrietta, Summary of Role in Providing Energy and Capacity Resources

Services Provided by Generating Resources	Discussion, GWF Henrietta
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 not* 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 AND RECOMMENDATIONS

GWF Henrietta would be an efficient, new, dispatchable natural gas-fired combined cycle power plant that would emit 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 the existing HPP that the project would replace, and the project’s GHG emissions are expected to be lower than those of other power plants and peaking projects that the project would displace and, thus, 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. GWF Henrietta would also provide other potential GHG benefits by filling nearly all of the expected future roles for gas-fired generation, in a high-renewables, low-GHG system.

Staff notes that mandatory reporting of GHG emissions per ARB greenhouse gas regulations would occur, and this would enable the ARB to gather the information needed to regulate GWF Henrietta 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 more fully developed and implemented.

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 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 GWF Henrietta project would not be subject to the Emission Performance Standard of SB 1368 if it continues to operate as a peaker and does not exceed a 60 percent capacity factor. The project could meet the EPS, if it exceeds a 60 percent capacity factor as long as it operates some reasonable fraction of the time in combined-cycle mode.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

No Conditions of Certification related to GHG emissions are 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, such as limits set by GHG emissions cap and trade markets.

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BIOLOGICAL RESOURCES
Testimony of Brian McCollough

INTRODUCTION

This analysis addresses project changes that would potentially affect biological resources in the project area. This analysis examines only those aspects of the Henrietta Peaker Project (HPP) project that would change because of the proposed amendment seeking to convert to the GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta), and that affect staff's testimony for Biological Resources as contained in the Energy Commission Decision on the HPP dated March 5, 2002 (CEC 2002). The significant project changes that would affect biological resource impact potential are:

1) Temporary disturbance to 4.52 acres for construction laydown and parking outside of the existing plant fence line.
2) Permanent disturbance to an additional 2.86 acres within the GWF 20-acre parcel, expanding the fenced project area from 7.0 to 9.86 acres.

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

There are no new or changed biological resource LORS that would be applicable to the amended project as proposed.

ANALYSIS

This analysis is based, in part, on information provided in the HPP Application for Certification (GWF Power Systems Company, Inc. 2001), GWF Henrietta amendment petition (GWF Energy, LLC., 2008), staff site visit conducted on October 22, 2008, and discussions with the U. S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG).

SETTING

In support of the proposed amendment, CH2M HILL biologists Gary Santolo and Virginia Dains surveyed the proposed project site on April 26, 2007. The permanent impacts of the proposed GWF Henrietta project would be located immediately east of the current fenced boundary of the existing HPP, and will expand the permanently fenced project area from 7.0 to 9.86 acres. Development of the proposed parking and construction laydown areas will result in temporary impacts to 4.52 acres. The construction parking is proposed along the south side of the GWF Henrietta facility, and the construction laydown area northeast of the project site. The project site is devoid of natural vegetation or natural communities, and the laydown areas were previously impacted by intensive agricultural use and HPP-related construction activities. The portion of the GWF Henrietta project that falls within the existing HPP fence line is graded and covered with concrete foundations, facility components, crushed rock, and a paved plant access road. The portion of the GWF Henrietta project that extends beyond the existing fence line includes a graded access road and areas currently in agricultural

production. During the staff site visit on October 22, 2008, the proposed parking and laydown areas were in use as a graded dirt access road or were planted in cotton.

Special-Status Species

Consultants to the applicant conducted reconnaissance-level wildlife and floristic surveys of the project site and a habitat suitability assessment for special-status species within a one-mile radius area around the proposed project site on April 26, 2007. California Natural Diversity Database (CNDDB) (CDFG 2008a) and California Native Plant Society special-status species data base (CNPS 2008) searches were also conducted. **BIOLOGICAL RESOURCES Table 1** identifies special-status species that have the potential to be present within the vicinity of the project area.

BIOLOGICAL RESOURCES Table 1
Special-Status Species Identified as Potentially Occurring in the Vicinity of the GWF Henrietta Site

Common Name Scientific Name	Status*	Habitat Type	Potential to Occur
Plants			
brittlescale *(Atriplex depressa)*	--/-- CNPS 1B.2	chenopod scrub, meadows and seeps, playas, valley and foothill grassland, vernal pools with alkaline clay soils	Not present; no appropriate habitat
Earlimart orache *(Atriplex erecticaulis)*	--/-- CNPS 1B.2	valley and foothill grassland	Not present; no appropriate habitat
subtle orache *(Atriplex subtilis)*	--/-- CNPS 1B.2	valley and foothill grassland	Not present; no appropriate habitat
California jewelflower *(Caulanthus californicus)*	FE/SE	chenopod scrub, pinyon and juniper woodland, valley and foothill grassland	Not present; no appropriate habitat
Panoche pepper-grass *(Lepidium jaredii* ssp. *album)*	--/-- CNPS 1B.2	alluvial fans and washes in valley and foothill grassland	Not present; no appropriate habitat
San Joaquin woolythreads *(Monolopia congdonii)*	FE/__ CNPS 1B.2	alkaline or loamy plains, often within chenopod scrub	Not present; no appropriate habitat
Invertebrates			
San Joaquin dune beetle *(Coelus gracilis)*	--/--	fossil dunes along western edge of San Joaquin valley	Not present; no appropriate habitat
valley elderberry longhorn beetle *(Desmocerus californicus* ssp. *Dimorphus)*	FT/--	riparian and oak savanna habitats with elderberry shrubs	Not present; no appropriate habitat
Amphibians and Reptiles			
western pond turtle *[Actinemys (Clemmys*)	--/SSC	ponds, marshes, or streams	Not present; no appropriate

marmorata]			habitat
blunt-nosed leopard lizard *(Gambelia sila)*	FE/SE, SFP	sparsely vegetated plains, alkali flats, grasslands, with sandy soils and scattered vegetation;	Not present; no appropriate habitat
San Joaquin whipsnake *(Masticophis flagellum ruddocki)*	--/SSC	open, dry habitats in the San Joaquin Valley with little or no tree cover	Not present; no appropriate habitat
California red-legged frog *(Rana aurora draytonii)*	FT/--	creeks and cold water ponds with emergent and subemergent vegetation;	Not present; no appropriate habitat
western spadefoot *[Spea* (*Scaphiopus*) *hammondii]*	--/SSC	shallow streams and seasonal wetlands such as vernal pools	Not present; no appropriate habitat
Birds			
tricolored blackbird *(Agelaius tricolor)*	--/SSC	nests in colonies in marsh vegetation, or upland sites with blackberries, thistles, nettles, and grain fields	Not present; no appropriate habitat
Western burrowing owl *(Athene cunicularia)*	--/SSC	requires habitat with open, well-drained terrain, short, sparse vegetation, and underground burrows	Not present; appropriate habitat available, but no burrows found
Swainson's hawk *(Buteo swainsoni)*	--/ST	consumes insects and small rodents, foraging in large, open plains and grasslands; hay, grain, and most row crops also provide suitable foraging habitat; nests in large trees	Potential foraging habitat; no appropriate nesting habitat
western snowy plover (inland population) *(Charadrius alexandrines nivosus)*	--/--	barren to sparsely vegetated ground at lakes, reservoirs, ponds, and riverine sand bars	Not present; no appropriate habitat
merlin *(Falco columbarius)*	--/--	clumps of trees or windbreaks required for nesting in open country	Not present; no appropriate habitat
loggerhead shrike *(Lanius ludovicianus)*	--/SSC	prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches	Potential habitat present
black-crowned night heron *(Nycticorax nycticorax)*	--/--	wetland habitats, including salt, brackish, and freshwater marshes, swamps, streams, lakes, and agricultural fields	Not present; no appropriate habitat
Mammals			
Nelson's antelope squirrel *(Ammospermophilus nelson)*	--/ST	occupies broken terrain with gullies and washes and dry, sparsely vegetated loam soils in the western San Joaquin Valley	Not present; no appropriate habitat
Fresno kangaroo rat *(Dipodomys*	FE/SE	occupies grassland and alkaline scrub communities on the floor of	Not present; no appropriate

nitratoides exilis)		the San Joaquin Valley	habitat
Tipton kangaroo rat *(Dipodomys nitratoides nitratoides)*	FE/SE	occupies saltbush scrub and sink scrub communities in the Tulare Lake basin	Not present; no appropriate habitat
Tulare grasshopper mouse *(Onychomys torridus tularensis)*	--/SSC	arid shrubland communities in hot, arid areas including alkali sink, mesquite, and saltbush scrub,	Not present; no appropriate habitat
San Joaquin pocket mouse *(Perognathus inornatus inornatus)*	--/--	annual grassland, saltbush scrub, and oak savannah habitats	Not present; no appropriate habitat
American badger *(Taxidea taxus)*	--/SSC	preferred habitats include grassland, savannas, and mountain meadows near timberline	Not present; no appropriate habitat
San Joaquin kit fox *(Vulpes macrotis mutica)*	FE/ST	Because agriculture has replaced much of the Central Valley's native habitat, species appears to have adapted to marginal areas such as grazed, nonirrigated grasslands, peripheral lands adjacent to tilled and fallow fields, irrigated row crops, orchards, vineyards, petroleum development and urban areas; may also use structures such as culverts, abandoned pipelines, and well casing as den sites	Potential habitat exists outside of existing project fenceline.

* Status legend:
CNPS 1B.1 = plants endemic to California which are seriously endangered throughout their range
CNPS 1B.2 = plants which are fairly endangered in California and elsewhere
FE = federally endangered
FT = federally threatened
SE = state endangered
ST = state threatened
SSC = state species of special concern
SFP = state fully protected animal
-- = no special-status (species for which dashes are shown for both federal and state status are included by CNDDB because of declining trends)
Sources: CDFG 2008a, CNPS 2008

Special-status plant and wildlife species were not observed in or adjacent to the project area during biological surveys. Although not observed in the project area, several special-status wildlife species are known to use disturbed areas in the region and thus have suitable habitat near the GWF Henrietta site. These species include burrowing owl (*Athene cunicularia*) and San Joaquin kit fox (*Vulpes macrotis mutica*).

Special-status plant species are not expected to occur in the project area. The CNDDB and CNPS data base searches identified six plant species that are known to occur in the general vicinity. These species were not observed in field surveys, and have little or

no potential to occur on site due to the high level of disturbance or lack of suitable habitat. Potential foraging habitat also exists for loggerhead shrike at the HPP site, and for Swainson's hawk on the adjacent farmland.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

IMPACTS

Potential impacts from construction of the proposed power plant to biological resources are associated with the temporary loss of San Joaquin kit fox (kit fox) habitat in the construction laydown and parking area, and from permanent loss of kit fox habitat from the expanded project fence line.

MITIGATION AND COMPENSATION

In connection with the development of the HPP in 2002, the applicant acquired incidental take authority from the USFWS and CDFG, and 10 acres of habitat conservation credits from the Kern Water Bank to mitigate the original HPP project's habitat loss impacts (Kern Water Bank 2008). The 10 acres of conservation credits was based on 7 acres of permanent disturbance and 11.7 acres of temporary disturbance, and compensation ratios of 1:1 for permanent disturbance and 0.2:1 for temporary disturbance. The permanent disturbance for the GWF Henrietta project would result in an additional 2.86 acres of loss of kit fox habitat. The construction parking and laydown use areas would result in the temporary loss of 4.52 acres of kit fox habitat.

The applicant discussed compensating for the additional 3 acres (2.86 acres rounded up to 3 acres) of permanent disturbance associated with GWF Henrietta by purchasing 3 acres of compensation habitat through the Kern Water Bank. This compensation suggested by the applicant does not consider the temporary habitat loss impacts that would be caused by fencing and excluding kit fox from the 4.52-acre parking laydown areas. The USFWS considers exclusion of kit fox from habitat that is less than 2 years in duration to be a temporary loss, and greater than 2 years to be permanent loss. Although the HPP did mitigate for the temporary habitat losses caused by use of the parking and construction laydown areas for the construction of the HPP in 2002 by providing habitat compensation, the reuse of those same areas for the GWF Henrietta project will require exclusionary fencing, and will create a new temporary kit fox habitat loss impact that will require mitigation through the provision of habitat compensation.

The habitat compensation ratios for loss of kit fox habitat required by the U.S. Fish and Wildlife Service (USFWS) have increased since the 2001 licensing of the HPP. The appropriate kit fox habitat compensation ratios that apply to the project area are 1.1:1 for permanent impacts and 0.3:1 for temporary impacts (USFWS 2008). The mitigation of kit fox habitat loss impacts for the GWF Henrietta project will require the purchase of at least 4.6 acres of conservation credits (2.9 acres x 1.1 compensation ratio = 3.2 acres for permanent impacts, and 4.5 acres x 0.3 compensation ratio = 1.4 acres for temporary impacts, with 3.2 acres + 1.4 acres = 4.6 acres of conservation credits required). The Energy Commission staff and CDFG (CDFG 2008b) agree with this recommendation, therefore Biological Resources Condition of Certification **BIO-8** requiring habitat compensation for the GWF Henrietta project should be added to reflect the need to purchase an additional 4.6 acres of habitat conservation credits from the

Kern Water Bank. Energy Commission staff confirmed that the Kern Water Bank has approximately 2,300 acres of available conservation credits, which indicates that purchase of conservation credits to compensate for the habitat loss impacts of the GWF Henrietta projects is possible (Kern Water Bank 2009).

Based on the result of the April 26, 2007 field survey conducted by the consultants to the applicant (GWF Energy LLC 2008), and a site visit by Energy Commission staff on October 22, 2008, potential construction related impacts to biological resources beyond loss of habitat are not expected to occur. A Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) was developed and adopted for the construction of the HPP, as required in Condition of Certification **BIO-6.** Any biological resources that could be encountered during construction of the GWF Henrietta project would be dealt with effectively through guidance measures provided in the existing BRMIMP. In the event that a special-status species is encountered, the BRMIMP implements avoidance strategies and mitigation measures for each sensitive biological resource. For the proposed amendment, the specific items related to the amount of habitat compensation required are addressed with a new Biological Resources Condition of Certification **BIO-8** that is consistent with the changes that would result from adoption of the proposed amendment and construction of the new GWF Henrietta project.

CONCLUSIONS AND RECOMMENDATIONS

The project changes as proposed in the Petition to Amend the license for the HPP, renamed GWF Henrietta, would conform to applicable LORS and would not have a significant effect on sensitive species or their habitat near the project providing that Biological Resources Condition of Certification **BIO-8** is adopted as shown below. The new project changes, as proposed, have potential for impacts to biological resources that can be mitigated to a less than significant level through purchase of at least 4.6 acres of kit fox habitat compensation lands in addition to the 10 acres required in the original Energy Commission Decision for the HPP in 2002. The kit fox habitat compensation ratios required by the USFWS have increased, and staff recommends addition of one condition of certification not originally contained in the Decision.

PROPOSED MODIFICATIONS TO CONDITION OF CERTIFICATION

COMPENSATORY HABITAT FOR GWF HENRIETTA EXPANSION

BIO-8 Prior to the start of any site mobilization activities, the project owner shall acquire at least 4.6 acres of conservation credits from the Kern Water Bank in accordance with the Kern Water Bank Habitat Conservation Plan (KWBHCP).

Verification: At least 30 days prior to the start of site mobilization activities, the project owner shall submit to the CPM documentation (letter, receipt, and a copy of the check) that it has secured at least 4.6 acres of mitigation credits through the KWBHCP. Within 30 days following start of site mobilization, the project owner shall submit to the CPM a revised BRMIMP that includes a summary of the KWBHCP's terms and conditions.

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CULTURAL RESOURCES
Testimony of Beverly E. Bastian

INTRODUCTION

On October 14, 2008, the Energy Commission received a petition from GWF Energy, LLC (GWF) to amend the Energy Commission Decision for the Henrietta Peaker Plant (HPP) to allow conversion to the GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta) The proposed facility would be located on approximately 10 acres of the existing HPP's 20-acre parcel, south of the city of Lemoore in Kings County (GWF 2008, p. ES-1).

The proposed new configuration would retain the existing LM6000 combustion turbine generators (CTGs), but would add two once-through steam generators to feed a 25-MW steam turbine generator (STG), increasing net generation from the facility to 120 MW. GWF also proposes to install an air-cooled condenser (ACC) to allow use of dry cooling at the converted plant, as well as a wet-surface air cooler (WSAC) for lube-oil cooling. GWF intends to replace the present selective-catalytic reduction and oxidation catalyst systems at the Henrietta plant with updated equipment to meet present standards. The new STG, and ACC would be constructed where the storm water retention basin is presently located, and a new storm water retention basin would be excavated to the east of present fenced plant area. The proposed modifications would largely be restricted to the already disturbed 7 acres of the present HPP site, but the addition of the storm water retention basin would expand the disturbed area to 9.86 acres. An additional 4.52 unfenced acres of the 20-acre HPP parcel east of the new storm water retention basin is proposed for temporary laydown and construction worker parking. This additional area was used for the same purposes during construction of the original peaker plant (GWF 2008, pp. 1-2–1-2, fig. 1-2).

Staff has concluded that potential impacts to cultural resources from the proposed amendment are limited to those which could occur during construction-related excavations and which could affect buried archaeological resources unknown at this time.

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

At the time of certification, LORS applicable to cultural resources were identified in staff's Final Staff Assessment. Those LORS would continue to apply to the amended project, and no new LORS or changes to LORS pertinent to this project have been identified.

ANALYSIS

In its petition, GWF identified five recorded cultural resources located on or near the HPP site. One consisted of two isolated fragments from prehistoric ground stone objects (see resource P-16-000199 in the next paragraph), and five were elements of electricity-transmission infrastructure, the 1911 Henrietta Substation, three 1941 transmission

lines, and one other transmission line of unspecified age. GWF reported that none of these was considered eligible for listing on the California Register of Historical Resources (CRHR) (GWF 2008, pp. 3-39–3-40). The transmission lines were not subject to HPP impacts, so in the Staff Assessment (SA) for HPP, staff limited its concerns to the two potentially CRHR-eligible (45 years or older) built-environment resources that were the only known cultural resources that the HPP might have affected. The Henrietta Substation was located north of the HPP and was subject to alterations to accommodate the HPP's interconnection. Staff agreed with GWF's recommendation that the substation did not retain sufficient integrity to be eligible for the CRHR, so HPP impacts to this structure would not require mitigation. The second resource, Avenal Cutoff Road, dates to 1936. HPP's natural gas pipeline trench along 25th Avenue was proposed to cross Avenal Cutoff Road. Neither GWF nor staff reached a conclusion on the CRHR eligibility of this resource, but staff recommended and GWF subsequently conducted monitoring of ground-disturbing activities in the vicinity of the road to record any evidence of earlier phases of road construction and to ensure mitigation of any CRHR-eligible features discovered during excavations (CEC 2001, p. 3.3-5).

In the HPP SA, Energy Commission cultural resources staff reported GWF's archaeologist's conclusion that no previously known archaeological resources were present on or near the HPP site, nor were any found during HPP project-related archaeological survey (CEC 2001, p. 3.3-5; GWF Henrietta 2001, p. C-9). Native Americans representing the Santa Rosa Rancheria, including tribal elders, visited the HPP site prior to construction, however, and collected several possible prehistoric artifacts. GWF's archaeologist identified one of the finds as a possible mortar fragment. The archaeologist visited the location of the find and additionally recovered a possible pestle fragment. The two fragments were given the designation P-16-000199 (GWF 2008, p. 3-39). The archaeologist concluded that the artifacts were isolates from the disturbed plow zone at the site (URS 2002, p. 1-2). In the cultural resources section of HPP's Application for Certification, GWF's archaeologist had indicated that the project area had a moderate level of archaeological sensitivity, due to its proximity to the shores of former Tulare Lake. This conclusion, the occurrence of prehistoric artifacts on the site, and the presence of ethnographically known villages in the vicinity led staff in the SA to recommend archaeological and Native American monitoring of all excavations on the plant site that would reach depths below the previous agricultural disturbance. This monitoring would ensure that impacts to any discovered, CRHR-eligible archaeological resources would be mitigated to a less-than-significant level (CEC 2001, p. 3.3-6).

The HPP SA also discussed the comments the Native American Heritage Commission (NAHC) provided to the Energy Commission regarding the construction of the HPP. The NAHC recommended that a Native American monitor be present during ground-disturbing HPP construction activities because of the possibility of unearthing previously unknown archaeological remains. The NAHC also requested that a Native American culturally affiliated with the site be present during construction worker cultural resources awareness training and participate in decisions regarding the selection of the appropriate curatorial facility for any recovered Native American artifacts. The NAHC further suggested that Native Americans should participate in decisions regarding any display and interpretation of recovered Native American artifacts, to ensure culturally

sensitive treatment. Staff recommended the adoption of **CUL-6**, which requires Native American monitoring where discovery of Native American artifacts might be anticipated, and **CUL-3**, which provides Native Americans an opportunity to comment on discoveries and proposed curation facilities (CEC 2001, p. 3.3-7).

Staff concluded in the SA that the HPP project would have no significant impacts on known or yet-to-be-discovered cultural resources with the adoption and implementation of six conditions of certification. These provided for a Cultural Resources Specialist (CRS) who would select archaeological monitors, prepare a Cultural Resources Monitoring and Mitigation Plan (CRMMP) and a final report on monitoring, train project construction workers to recognize archaeological materials, and supervise the monitoring of project excavations that exceeded the depth of previous disturbance (CEC 2001, pp. 3.3-7–3.3-13).

A report documenting the consequent archaeological and Native American monitoring of HPP construction-related excavations found that no cultural resources were identified as a result of monitoring on the plant site and along the telephone line route, but monitors found one isolated artifact, a fragment of a ground stone object, during the excavation of the trench for the natural gas pipeline. Because an isolated artifact does not constitute an archaeological site, the find was not eligible for the CRHR. Thus the project's impact on the find was not significant, and no mitigation for the impact was required (URS 2002, pp. 3-1–3-2).

In the present analysis, staff also considered possible continuing Native American concerns about the potential for prehistoric cultural resources on the HPP site. On April 22, 2009, staff sent a letter to Clarence Atwell, Chairperson of the Tachi Yokut Tribe informing him of the HPP modifications and asking him to contact staff if he had any concerns about the proposed project's potential impacts on Native American cultural resources. To date staff has received no response to this letter.

Based on this background, staff concluded that as-yet-undiscovered buried archaeological deposits are the only type of cultural resources potentially subject to impacts from the presently proposed HPP modifications, and then only in locations where project-related excavations would reach previously undisturbed soils and sediments. Before the HPP was constructed, the parcel on which it was to be built was a cotton field and had been used for agricultural purposes since at least 1943 (Harding ESE 2001, p. 1). Consequently, staff assumes that plowing and deep soil ripping have disturbed the upper 4 feet of site soils and sediments. Staff also assumes subsequent disturbance to greater depths in some parts of the HPP plant site due to HPP construction. Thus, staff assumed that the only areas that could be subject to impacts from the newly proposed HPP modifications would be archaeological resources buried in undisturbed soils and sediments below 4 feet in depth over most of the project site, and deeper in those areas where HPP construction-related excavations exceeded 4 deep in depth.

Staff's analysis therefore focused on determining where HPP modification-related excavations on the plant site would reach sediments previously undisturbed below 4 feet in depth. For this refined approach, staff needed information on both the grade changes associated with the previous HPP construction activities and the depth of

excavations required for the proposed modifications. The cultural resources and paleontological resources monitoring reports for the previous HPP construction provided information on grade changes, and GWF Data Responses submitted in support of the current petition provided information on both grade changes and depth of proposed new ground disturbance.

For the present Petition, staff asked GWF in Data Requests to provide information on the estimated depths of excavations associated with some of the proposed new components—the new generator step-up transformer (GSU), the new STG, the new ACC, the extension of the fire protection system piping, and the new storm water retention basin. From GWF's Data Responses, and taking into consideration staff's assumption of the likely presence of undisturbed soils and sediments below 4 feet in depth over most of the project site, staff concluded that proposed HPP modifications in three locations on or adjacent to the plant site could have the potential to reach previously undisturbed soils and sediments that could contain buried archaeological deposits (GWF 2009, Table DR-1, p. 3; Figures DR2-1, DR3-1):

1. The location to the east of the extant storm water retention basin that was formerly farmed but apparently not previously disturbed by HPP construction-related excavation, where the new storm water retention basin would be excavated to 3 feet in depth;
2. The location just to the west of the extant storm water retention basin that was formerly farmed but possibly not previously disturbed by HPP construction, where the extension of the fire protection system piping would be excavated to a depth of 4.5 feet; and
3. The location of the foundation excavations for the new GSU, new STG, and new ACC, at depths of 3.5 feet, 5 feet, and 7 feet below grade, respectively, in the area of the existing storm water retention basin, which was previously excavated to a depth in excess of 4 feet.

The available information on grade changes from the monitoring logs of the Cultural Resources Monitor (CRM) and the Paleontological Resources Monitor (PRM) for the original HPP construction indicates that excavations in excess of 4 feet were limited to a very few areas of the HPP site, and that in the deeper excavations, ground water intrusion created problems with digging equipment, with collapsing sidewalls, and with the failure of materials being used for foundations. The logs also indicate that 1 foot or more of imported fill was frequently encountered on the surface of the plant site. An additional pertinent observation from the logs was that in those locations on the plant site where deeper excavations were made, such as the 5-to-6-foot-diameter, 22-foot-deep holes augered to install piers in the HPP switchyard, the stratigraphic column contained just two layers of undisturbed sediments: an upper layer of homogeneous, dark-brown sticky clay, with few inclusions, observed to an average depth of 15 feet, with a yellow-brown sandy clay with 20 percent caliche inclusions below that. The systematic examination by both the CRM and the PRM of the spoils from plant site excavations produced neither artifacts nor fossils. The PRM noted no paleosols (developed soil surfaces that have been buried over time but would have been accessible to prehistoric Native Americans) in any of the excavations.

Staff had also asked GWF in Data Requests to provide information on grade changes by indicating on a site plan the areas where previous HPP construction-related excavations exceeded 4 feet in depth. Generally the grade change information provided by GWF in Figure DR3-1 in Data Responses (GWF 2009) is corroborated by the HPP monitoring logs, except for the storm water retention basin and the fire protection system piping. When discussing the excavation of the basin, both construction monitors had reported that the total excavated depth was to be 2 feet (URS 2002, app. A, p. 6; Lawler 2002, app. A, p. A-7). In contrast, GWF now reports that the existing storm water retention basin is 6.5 feet deep (GWF 2009, p. 3), and Petition Figure 2-9 shows the existing basin as 5 feet deep (GWF 2008). Neither construction monitor provided any other information on the retention basin, such as a later decision to increase its capacity by deepening the basin or by adding fill around the top of the basin to raise its sides, as would apparently be done for the proposed new basin (GWF 2009, note to Table 3, p. 3). While discussing the trench for the original fire protection system piping, both monitors had reported it as precisely 28 inches deep (URS 2002, App. A, p. 4; Lawler 2002, App. A, p. A-12). In contrast, GWF's new additions to the fire protection system piping are proposed for installation in a 4.5-foot-deep trench (GWF 2009, Table 3, p. 3). This seems a fairly drastic difference in level—36 inches—for water pipes that have to be joined.

So, data conflicts and oddities have made more difficult staff's efforts to definitively answer the questions of at what depths and in what places on the plant site native soils could be reached by project-related excavations. First, the variable amounts of surface fill noted by the HPP's CRM and PRM erode the accuracy of any effort to project down from the HPP's extant grade to depths where undisturbed sediments could occur in the locations where the deepest new excavations would be made. Second, the 3.5-foot elevation difference between the extant plant grade (higher) and the apparently undeveloped present grade (lower) in the location of the proposed new storm water retention basin (GWF 2009, note to Table 3, p. 3), suggests that fill may have been used to raise the extant plant grade by some 3 feet, perhaps because of the relatively high water table, perhaps in association with raising the sides of the extant basin to increase its capacity, or for both reasons and others, as well. Third, GWF's estimation of the vertical extent of disturbance involved in the creation of the extant storm water retention basin conflicts with that reported in the HPP monitoring logs, but the hypothetical later addition of fill to raise the plant grade and basin sides would resolve that conflict. Fourth, it seems unlikely that additions to the fire protection system piping would be installed 3 feet deeper than the original piping, but, again, this apparent oddity would be resolved if the entire site grade had been raised about 3 feet.

In any event, one conclusion emerges from the above-noted data conflicts: It is probable that undisturbed soils and sediments beneath the general area of the extant storm water retention basin lie even deeper below the extant plant grade than GWF's estimation of vertical ground disturbance indicates, due to the likely presence of 3.0–3.5 feet of surface fill in that area. Considering the probable presence of this fill, and considering that this fill could overlie as much as 4 feet of sediments previously disturbed by agriculture, it is unlikely that excavations for the foundations of the new equipment and the extension of the fire protection system proposed for that area would reach undisturbed sediments. Moreover, the undisturbed sediments on the plant site

that were observed and reported by the PRM during HPP excavations appear to be unlikely to contain buried archaeological deposits.

In the location of the new storm water retention basin, its use during HPP construction as a laydown area would have resulted in only superficial ground disturbance. Since the new basin would require only 3 feet of excavation (and the apparent addition of 3.5 feet of fill to raise the basin sides (see GWF 2009, note to Table 3, p. 3)), the vertical ground disturbance for the new basin would be within the 4-foot-deep uppermost zone that staff assumes was previously disturbed by agriculture and so would not reach undisturbed soils and sediments possibly containing buried archaeological deposits, resulting in no impacts to such resources.

CUMULATIVE IMPACTS

A cumulative impact under California Environmental Quality Act (CEQA) refers to a proposed project's incremental effects considered over time and together with those of other nearby, past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project. Cumulative impacts to cultural resources in the vicinity of the HPP site could occur if any other existing or proposed projects, in conjunction with the proposed HPP modifications, had or would have impacts on cultural resources that, considered together, would be significant.

The original HPP project had no known impacts on cultural resources. Other nearby past projects to which a CEQA review was applied by the appropriate lead agencies presumably complied with conditions that mitigated any impacts to cultural resources to a less-than-significant level. To determine if any proposed or foreseeable developments are being planned near the HPP site, GWF consulted with the Kings County Planning Department and learned that none are planned within 1.0 mile (GWF 2008, p. 3-41).

Staff has identified no impacts to known cultural resources from the proposed HPP modifications, and the existing conditions of certification, modified as proposed by staff, would provide for the identification, evaluation, and avoidance or mitigation of impacts to previously unknown CRHR-eligible archaeological resources discovered during the construction of the project. Thus any significant impacts from the proposed HPP modifications would be mitigated to below the level of significance.

Proponents of any future projects in the area could mitigate impacts to as-yet-undiscovered subsurface archaeological sites to less-than-significant levels by requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for resources evaluated as CRHR-eligible. Impacts to human remains can be mitigated by following the protocols established by state law in Public Resources Code section 5097.98.

Since the impacts from the proposed HPP modifications would be mitigated to a less-than-significant level by the project’s compliance with staff’s proposed modified Conditions of Certification **CUL-1** through **CUL-6**, and since similar protocols can be applied to other projects in the area, staff does not expect any incremental effects on

cultural resources from the proposed HPP modifications to be cumulatively considerable when viewed in conjunction with other projects.

CONCLUSIONS AND RECOMMENDATIONS

GWF maintains that encountering no archaeological deposits during prior HPP construction-related excavations, foregoing any excavations deeper than those previously made, and excavating mostly in previously disturbed areas all support the estimation that buried archaeological deposits would not be encountered during excavations associated with the proposed modifications (GWF 2009, p. 5). GWF therefore has stated that no mitigation measures for impacts to cultural resources beyond those provided in the conditions of certification for the original HPP project would be needed (GWF 2008, p. 3-41). GWF, however, contemplates general revisions to the existing HPP cultural resources conditions of certification that would reduce the owner's responsibilities for monitoring ground disturbance and for filing reports if no resources are identified by monitors (GWF 2008, p. 3-41; Scholl 2009). GWF did not provide a set of revised cultural resources conditions with its petition, but expects, after collaboration with Energy Commission staff, to craft and submit a set during the final stages of review of its petition (GWF 2008, p. 4.1).

Staff's analysis supports GWF's conclusions that no mitigation measures beyond those already included in the original HPP cultural resources conditions of certification would be needed, and, in fact, proposes revisions to the original conditions to forego monitoring, as long as no modification-related excavations reach deeper than the depths currently projected by GWF for the foundation of the ACC, for the new storm water retention basin, and for other foundations and trenches, as indicated in the petition and data responses.

In conclusion, staff has reviewed the GWF Henrietta modifications petition for potential effects on cultural resources and consistency with applicable LORS. Based on this review, staff has determined that the proposed amendment would have no impact on previously identified cultural resources. Additionally, the modifications would have no impact on buried archaeological resources unexpectedly encountered during construction as long as no modification-related excavations reach deeper than the 8 feet below grade projected by GWF for the foundation of the ACC in the area at and near the extant storm water retention basin or deeper than the 4 feet below grade projected by GWF for the new storm water retention basin to the east of the extant basin. Also, staff has determined that the activities proposed in the petition would comply with all applicable LORS. Consequently, under staff's modified conditions, proposed below, staff recommends approval of the petition.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff recommends modifications to the cultural resources conditions of certification for GWF Henrietta, as shown below. (Strike-through text represents deleted language; underlined text represents inserted language.)

DESIGNATED CULTURAL RESOURCES SPECIALIST

CUL-1 Prior to the start of ground disturbance, the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name and resume of its Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, who will be responsible for implementing all cultural resources conditions of certification. No ground disturbance shall occur prior to CPM approval of the CRS and alternates, unless such activities are specifically approved by the CPM.

(1) The resume for the CRS and alternate, if an alternate is proposed, shall include information that demonstrates that the CRS meets the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published in the Code of Federal Regulations, 36 CFR Part 61.

The technical specialty of the CRS shall be appropriate to the needs of this project and shall include a background in anthropology, archaeology, history, architectural history, or a related field.

The background of the CRS shall include at least three years of archaeological or historic, as appropriate, resources mitigation and field experience in California~~;~~.

The resume shall include the names and phone numbers of contacts familiar with the CRS's work on referenced projects. ~~(2)~~ The resume shall also demonstrate, to the satisfaction of the CPM, the appropriate education and experience to accomplish the cultural resources tasks that must be addressed during project ground disturbance, construction, and operation.

(2) The CRS may obtain qualified cultural resources monitors to monitor as necessary on the project. Cultural resources monitors shall meet the following qualifications~~.~~:

A BS or BA degree in anthropology, archaeology, historical archaeology, or a related field, and one year experience monitoring in California; or

An AS or AA in anthropology, archaeology, historical archaeology, or a related field, and four years experience monitoring in California; or

Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of monitoring experience in California.

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

Register of Historical Resources (CRHR). Moreover, the project owner shall ensure that all archaeological technical reports are submitted in Archaeological Resource Management Report (ARMR) format as recommended by the California Office of Historic Preservation (OHP).

Verification: (1) At least ~~forty-five (~~45~~)~~ days prior to the start of ground disturbance, the project owner shall submit the name and statement of qualifications of its CRS and alternate CRS, if an alternate is proposed, to the CPM for review and approval.

At least ~~ten (~~10~~)~~ days prior to the termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval.

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

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

PROJECT MAPS SHOWING GROUND DISTURBANCE

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

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

(3) At a minimum, the CRS shall consult weekly with the project superintendent or construction field manager, until ground disturbance is completed, to determine whether depths identified in CUL-6 as requiring archaeological monitoring would be reached, and to confirm area(s), if any, to be worked during the next week. A current schedule of anticipated project activity shall be

provided to the CRS on a weekly basis during ground disturbance and provided to the CPM in each Monthly Compliance Report (MCR).

Verification: (1) At least ~~forty~~ 40 days ~~(40)~~ prior to the start of ground disturbance, the project owner shall provide the designated cultural resources specialist and the CPM with the maps and drawings.

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

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

(4) If there are changes to the scheduling of the construction phases of the project, a letter shall be submitted to the CPM within ~~five (~~5~~)~~ days of identifying the changes.

A copy of the current schedule of anticipated project activity and a copy of current maps shall be submitted in each MCR.

CULTURAL RESOURCES MONITORING AND MITIGATION PLAN

CUL-3 Prior to the start of ground disturbance the designated cultural resources specialist shall prepare, and the project owner shall submit ~~to the~~ for CPM~~for~~ review and approval, an updated~~a~~ Cultural Resources Monitoring and Mitigation Plan (CRMMP). The updated CRMMP shall consist of the original Henrietta Peaker Plant (HPP) CRMMP with a new appendix that discusses the implementation of the modifications in the conditions.. CPM approval of the updated CRMMP shall occur prior to any ground disturbance, unless such activities are specifically approved by the CPM.

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

a. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities. Native American monitors/consultants shall be provided an opportunity to provide comments regarding the choice of the curation facility.

b. A discussion of the location(s) where monitoring of project construction activities is deemed necessary. Monitoring shall be conducted full time~~,~~ during ground disturbance that reaches deeper than the 8 feet below grade projected by GWF for the foundation of the air-cooled condenser (ACC) in the area at and near the extant storm water retention basin or deeper than the 4 feet below grade projected by GWF for the new storm water retention basin to the east of the extant basin, or anywhere excavation exceeds the depths proposed in the petition and data responses.

c. A discussion of the requirement that, if there is an unanticipated discovery, all cultural resources encountered will be recorded on a ~~DPR~~ Department of Parks and Recreation Primary F~~f~~orm 523 and mapped (may include photos).

d. A discussion that all archaeological materials collected as a result of the archaeological investigations shall be curated in accordance with t~~T~~he State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum. ~~The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Code of Federal of Regulations, Section 79.~~

   If there is an unanticipated discovery and materials are collected, an addendum to the CRMMP shall be provided that discusses any requirements, specifications, or funding needed for curation of the materials to be delivered for curation, and how requirements, specifications, and funding will be met. The name and phone number of the contact person at the curating institution shall also be included. In addition, information shall be included indicating that the project owner will pay all curation fees and that any agreements concerning curation will be retained and available for audit for the life of the project.

e. A discussion of the proposed Cultural Resources Report (CRR), which shall be written only if any monitoring is conducted and prepared according to ARMR (Archaeological Resource Management Report) Guidelines. The CRR shall consist of the original HPP CRR, with a new appendix that reports on the new monitoring and its results. A~~ll survey~~ new records or reports~~, monitoring records, and additional research reports~~ not previously submitted to the California Historical Resources Information System (CHRIS) shall be included as an appendix to the CRR. Comments provided by Native American monitors/consultants regarding newly discovered Native American artifacts, if any, shall be included in this report. This report shall be submitted to the CPM after the conclusion of ground disturbance (including landscaping). This report shall be considered final upon approval by the CPM.

Verification: At least ~~thirty (~~30~~)~~ days prior to the start of ground disturbance, the project owner shall provide the updated Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resources specialist, to the CPM for review and written approval.

At least ~~thirty (~~30~~)~~ days prior to ground disturbance the project owner shall submit a letter to the CPM indicating that they will pay any ~~curation~~ fees for curation of any collected archaeological artifacts.

The updated CRR shall be submitted to the CPM within ninety (90) days after completion of ground disturbance (including landscaping) for review and approval.

Within ~~ten (~~10~~)~~ days after CPM approval, the project owner shall provide documentation to the CPM that copies of the updated CRR have been provided to the curating institution (if archaeological materials were collected), the SHPO, and the CHRIS.

CULTURAL RESOURCES AWARENESS TRAINING

CUL-4 ~~Worker Environmental~~ Cultural Resources Awareness Training for all new employees shall be conducted on a weekly basis prior to and during periods of

ground disturbance (including landscaping). Concerns, if any, of representatives of the Santa Rosa Rancheria regarding treatment of Native American artifacts and burials shall be incorporated into the training program. The training may be presented in the form of a video. The training shall include a discussion of applicable laws and penalties under the law. Training shall also include samples or visuals of artifacts that might be found in the project vicinity and the information that the CRS, alternate CRS, or monitor has the authority to halt construction in the event of a discovery or unanticipated impact to a cultural resource. The training shall also instruct employees to halt or redirect work in the vicinity of a find and to contact their supervisor and the CRS or monitor. An informational brochure shall be provided that identifies reporting procedures in the event of a discovery. Workers shall sign an acknowledgement form that they have received training and a sticker shall be placed on hard hats indicating that environmental training has been completed.

Verification: Copies of signed acknowledgement forms shall be provided in the MCR.

CULTURAL RESOURCES SPECIALIST AUTHORITY

CUL-5 The CRS, alternate CRS, and the Cultural Resources Monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resources sites or materials are encountered or if known resources may be impacted in a previously unanticipated manner.

If such resources are found, the halting or redirection of construction shall remain in effect until all of the following have occurred:

a. the CRS has notified the CPM and the project owner of the find and the work stoppage;
b. the CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
c. any necessary data recovery and mitigation has been completed.

If data recovery or other mitigation measures are required, the CRS and/or the alternate CRS and cultural resources monitor(s), including Native American monitor(s), shall monitor these data recovery and mitigation measures, as needed.

For any cultural resource encountered, the project owner shall notify the CPM within 24 hours after the find.

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

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

CULTURAL RESOURCES SPECIALIST DUTIES

CUL-6 (1) The CRS, alternate CRS, or monitors shall monitor ground disturbance full time ~~in the vicinity of~~ on the project site where project ground disturbance reaches deeper than the 8 feet below grade projected by GWF for the foundation of the ACC in the area at and near the extant storm water retention basin or deeper than the 4 feet below grade projected by GWF for the new storm water retention basin to the east of the extant basin, or anywhere excavation exceeds the depths proposed in the petition and data responses. ~~exceeds previously disturbed soil. Cultural resources monitoring shall also occur full time on the gas pipeline in the vicinity of the Avenal Cutoff Road. Additional monitoring shall occur at the discretion of the CRS.~~ In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter providing a detailed justification for ~~that decision~~ a ~~to~~ reduction~~e~~ in the level of monitoring shall be provided to the CPM for review and approval.

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

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

(4) A Native American monitor shall be obtained to monitor ground disturbance in areas where archaeological monitoring is required per clause (1) in this condition, and where Native American artifacts may be discovered. Informational lists of concerned Native Americans and Guidelines for Monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that will be monitored. Native American monitors shall also be given an opportunity to comment on any discovered Native American artifacts. These comments shall be included in the CRR, if a CRR is required ~~in CUL-3~~.

Verification: (1) During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval.

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

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

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

REFERENCES

CEC 2001—California Energy Commission, Henrietta Peaker Project: Staff Assessment for Certification, 12/-/2001.

GWF 2001—GWF Energy, LLC, GWF Henrietta: Cultural Resources (Archaeological and Historic Built Environment Resources), June, 2001. Submitted to Dockets (with the Petition for License Amendment for the Henrietta Peaker Plant), 10/14/2008.

GWF 2008—GWF Energy, LLC, Petition, GWF Henrietta Combined-Cycle Power Plant, October, 2008. Submitted to Dockets, 10/14/2008.

GWF 2009—GWF Energy, LLC, Data Responses Set 1 (Responses to Data Requests 1 through 11), GWF Henrietta Peaker Plant (01-AFC-18[C]). Submitted to Dockets, 1/-/2009.

Harding ESE 2001—Harding Engineering and Environmental Services, Phase I Environmental Site Assessment, GWF Power Systems, Henrietta Peaker, 25th Avenue, Henrietta, California, prepared for GWF Power Systems, 6/1/2001.

Lawler 2002—Lawler Associates Geoscience, GWF Henrietta Peaker Project: Final Paleontological Resources Report (Condition of Certification PAL-6), prepared for GWF Power Systems and the California Energy Commission, 7/-/2002.

URS 2002—URS Corporation, GWF Henrietta Peaker Project: Final Cultural Resources Report (Condition of Certification CUL-3), prepared for GWF Power Systems and the California Energy Commission, 7/2/2002.

Scholl 2009—Jennifer Scholl, Senior Project Manager, CH2MHill, e-mail to Beverly E. Bastian, regarding previously disturbed areas at the Henrietta Peaker project site, 3/18/09.

LAND USE
Testimony of Robert Fiore

INTRODUCTION

The Henrietta Peaker Project (HPP) was certified by the Energy Commission in January 2002 under the Application for Certification (AFC) process. At the time, the HPP was analyzed to determine whether the project would result in land use planning and agriculture resources impacts pursuant to the California Environmental Quality Act (CEQA) and the CEQA Guidelines. Similarly, the project was reviewed to ensure compliance with applicable land use planning and agricultural laws, ordinances, regulations and standards (LORS). It was determined that the HPP did not result in land use planning and agriculture resources impacts and was in compliance with applicable land use planning and agricultural LORS, with the effective implementation of the Conditions of Certification.

The new Henrietta Combined-cycle Power Plant (GWF Henrietta) facilities are proposed to be contained within the current project footprint. Further, the project's construction lay down area and construction parking are to occur on lands within the project parcel that were analyzed as part of the original AFC process. With the effective implementation of Condition of Certification **LAND-4**, as modified, the proposed project would not pose additional land use planning and agricultural resources impacts and would be in compliance with land use planning LORS.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Applicable LORS pertinent to the proposed conversion's new facilities can be found in the County of Kings Zoning Ordinance, Number 265.65, et seq. The County of Kings Zoning Ordinance is applicable because it contains site development criteria and conditional use permit requirements. Site development criteria and requirements for conditional use permits are applicable to the proposed conversion because the project owner proposes to construct additional facilities, buildings or structures. Such facilities, buildings or structures must comply with the County's adopted development criteria (setbacks, building height, lot coverage, etc.) as cited in the County's Zoning Ordinance and as required for obtaining a Conditional Use Permit. **LAND USE Table 1** contains the applicable LORS to the proposed power plant conversion.

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

Applicable Law	Description
Local	
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 4. A. Agricultural Districts Sec. 403. AX. Exclusive Agricultural District D. Conditional Uses; planning commission approval	Thermal power generating facilities that commercially produce power for sale, which comply with all local, regional, State, and Federal regulations are a permitted use subject to obtaining a Conditional Use Permit.
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 19. Permits for Conditional Uses Sec. 1901. Purpose	In certain districts, conditional uses are permitted subject to the granting of a use permit. Because of their unusual characteristics and potential for causing significant adverse environmental effects, conditional uses require special consideration so that they may be located properly with respect to their effects on surrounding properties and the environment.
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 19. Permits for Conditional Uses Sec. 1902. Powers of Planning Commission	The Planning Commission is the administrative agency authorized to grant use permits for such conditional uses in such districts as are prescribed in the district regulations of this Ordinance, subject to review by the Board of Supervisors, in accordance with the procedure prescribed in this article.
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 19. Permits for Conditional Uses Sec. 1903. Application and fee.	This section requires a project to undergo site plan review.
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 19. Permits for Conditional Uses Sec. 1908. Action by the Planning Commission	This section provides the findings required for Use Permits.

ANALYSIS

The project site is located in Kings County approximately 1 mile south of Lemoore National Air Station. According to the Petition to Amend, the facilities to be constructed for the proposed conversion would be contained within the existing 20 acre project site. The HPP site (APN 024-190-070) is located within the AX, Exclusive Agricultural designated zoning district. A conditional use permit is required for thermal power generating facilities that commercially produce power for sale. Site design development standards are implemented as part of the site plan review process.

Construction parking and some new facilities related to the conversion, such as the planned expanded and relocated storm water detention basin, are proposed to extend beyond the current 7 acre development footprint, to a total of about 9.9 acres, but not

beyond the 20 acre project site. Construction would be on lands disturbed by previous construction activities associated with the existing power plant, and then returned to agricultural production.

Other than the adjacent Pacific Gas & Electric (PG&E) substation, there are no structures within the immediate vicinity of the project site. Cultivated cropland is the dominant use surrounding the project site, including on the balance of GWF's 20-acre plot. Surrounding land uses within 1 mile of the project site are provided in the **LAND USE Table 2**.

LAND USE Table 2
Vicinity Land Use and Zoning

Parcel	City's General Plan Land Use	Zoning	Existing Uses
Subject Site	Exclusive Agricultural	AX	peaker power plant
North	Exclusive Agricultural	AX	PG&E substation, agricultural crops
East	Exclusive Agricultural	AX	vacant, agricultural crops
South	Exclusive Agricultural	AX	vacant, agricultural crops
West	Exclusive Agricultural	AX	vacant, agricultural crops

The Local LORS found in the County of Kings Zoning Ordinance ensure compatibility in types of land uses and consistency in terms of development pattern. Determining whether a project is compatible and consistent with surrounding land uses is based on several factors such as planned land uses, zoning, scale, intensity, nuisance effects and use type. The proposed facilities for the conversion of the power plant from a peaker to a combined-cycle would not present new compatibility or consistency conflicts. The new facilities are similar in nature to existing facilities and would not present a significant change in terms of size, nuisance, intensity, etc. Existing facilities were assessed and determined to be consistent and compatible as part of the project's previous certification.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The project will not present Land Use impacts under CEQA. Environmental effects pertaining to land use planning and agricultural resources are negligible since the proposed conversion does not involve additional lands beyond the project's 20 acre site analyzed as part of the HPP.

A project may also generate a potential significant environmental impact related to land use if it would introduce an unmitigated air quality, noise, public health hazard, or water supply affect on surrounding properties. See the **Air Quality**, **Noise**, **Visual Resources, Water Quality** and **Public Health** sections of the SA for further discussion of potential project impacts and mitigation.

LORS COMPLIANCE

The site is planned (General Plan) and zoned (Zoning Ordinance) for Exclusive Agricultural. A conditional use permit is required for thermal power generating facilities that commercially produce power for sale. Site design development standards are implemented as part of the site plan review process. Standards pursuant to the Kings County Zoning Ordinance, Ordinance Number 265.65, Sec. 403, AX, Exclusive Agricultural District include:

1. Minimum Site Area: 40 acres
2. Maximum Building Height: no limitation
3. Minimum Frontage: no restrictions
4. Yards: front, 50’ from property line or 80’ from street centerline; back, 10’; side, 10’ on interior and 20’ on corner lots.
5. Maximum Building Coverage: no limitation
6. Lot Width: Minimum width 660’

Kings County Zoning Ordinance, Article 19, Section 1903 requires certain data to be submitted with a use permit application as a means to review site development, prepare findings and formulate conditions. Data required pursuant to Section 1903 includes:

- Site plan with lot dimensions, buildings and structures, yards, walls, fences and gates, parking and loading, signs, lighting, street dedications, landscaping, etc.
- Site plan shall be prepared enabling decision makers to find that:
  a. All applicable provisions of the Ordinance are complied with.
  b. Traffic congestion is avoided, pedestrian and vehicular safety and welfare are protected, and there will be no adverse effect on surrounding property.

Pursuant to Kings County Zoning Ordinance, Section 1908, decision makers may grant a use permit after making the following findings based on the application and supporting evidence:

1. The proposed location of the conditional use is in accordance with the objectives of the *Zoning Ordinance* and the purposes of the district in which the site is located.
2. The proposed location of the conditional use and the conditions under which it would be operated or maintained will not be detrimental to the public health, safety, or welfare, or materially injurious to properties or improvements in the vicinity.
3. The proposed conditional use will comply with each of the applicable provisions of this Ordinance.
4. No process, equipment or materials shall be used which are found by the Planning Commission to be substantially injurious to persons, property, crops, or livestock in the vicinity by reasons of odor, fumes, dust, smoke, cinders, dirt, refuse, water carried wastes, noise, vibration, illumination, glare or unsightliness or to involve any undue risk of fire or explosion.

Proposed Findings for the Conditional Use Permit:

1. Section 403, the AX zoning district, is intended to reserve land for agriculture crops and small concentrations of livestock. Thermal power generating facilities are permitted as a conditional use (Section 403, D, 11) but they present characteristics that may cause environmental effects on surrounding properties and environment. Zoning Ordinance objectives include determining effects on surrounding properties and on the environment. As stated herein, land use planning effect on surrounding properties and on the environment is negligible as the number and size of facilities constitutes a small percentage increase in terms of scale or nuisance in relation to the existing facilities, and does not pose effects on agricultural land use. To achieve the objectives of the Zoning Ordinance, the decision makers may impose conditions to off-set environmental effect. Consequently, the Energy Commission may impose conditions of certification to minimize effect with respect to noise, odor and other nuisances and with respect to air quality, water resources, visual resources, etc.
2. The construction and operation of the proposed facilities are consistent with the existing development. In addition, the Energy Commission will impose conditions of certification (COC) to protect the public health, safety, and welfare, and to ensure that the facilities will not be materially injurious to properties or improvements in the vicinity.
3. Condition of Certification (COC) **LAND-1** requires the project owner to construct facilities in compliance with the County's zoning ordinance and other relevant development standards.
4. A project may also generate a potential significant environmental impact related to land use if it would introduce an unmitigated air quality, noise, public health hazard, or water supply affect on surrounding properties. See the **Air Quality**, **Noise**, **Visual resources, Soil & Water Resources, Public Health** and other sections of this staff analysis for a detailed discussion of potential project impacts, mitigation and conditions of certification.

LAND USE Table 3 shows the applicable Land Use LORS and the basis for compliance as determined by the Energy Commission staff's analysis.

LAND USE Table 3
Proposed Project's Conformance With
LORS Applicable to Land Use and Agriculture Resources

LORS		Consistency Determination	Basis for Consistency
Source	**Policy and Strategy Descriptions**		
Local			
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 4, A, Agricultural Districts Sec. 403, AX Exclusive Agricultural District D. Conditional Uses; planning commission approval	Thermal power generating facilities that commercially produce power for sale, which comply with all local, regional, State, and Federal regulations are a permitted use subject to obtaining a Conditional Use Permit.	YES	Permitted Use with a Conditional Use Permit.
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 19, Permits for Conditional Uses Sec. 1901, Purpose	In certain districts, conditional uses are permitted subject to the granting of a use permit.	YES	See Conditional Use Permit Findings.
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 19, Permits for Conditional Uses Sec. 1902, Powers of Planning Commission	The Planning Commission is the administrative agency authorized to grant use permits for such conditional uses in such districts as are prescribed in the district regulations of this Ordinance, subject to review by the Board of Supervisors, in accordance with the procedure prescribed in this article.	YES	The Energy Commission possesses exclusive authority for certifying and approving power plants and amendments.
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 19, Permits for Conditional Uses Sec. 1903, Application and fee.	This section requires a project to undergo site plan review.	YES	COC Land-3, as modified, requires the submittal of a site plan.
Kings County Zoning Ordinance, Ordinance Number 265.65 Article 19, Permits for Conditional Uses Sec. 1908, Action by the Planning Commission	This section provides the findings required for Use Permits.	YES	See Conditional Use Permit Findings.

CONCLUSIONS AND RECOMMENDATIONS

The proposed amendment to the Energy Commission's certification of the Henrietta Peaker Plant project, with the effective implementation of staff's recommended additional conditions of certification, would be in compliance with the applicable laws, ordinances, regulations, and standards (LORS) pertaining to state and local land use planning. Additionally, the approval of the major amendment would not generate a significant impact under the "Land Use Planning" and "Agricultural Resources" sections of the CEQA guidelines.

Two Kings County requirements minimize compatibility and consistency issues. Zoning Ordinance Number 265.65, Article 19, Sec. 1903 provides the requirement for submitting a site plan. Except for the exclusive authority of the Energy Commission, the City would require site plan review and approval. Additional Condition of Certification **LAND-4,** as modified, requires site plan submittal to the County of Kings. Also, any development on-site must conform to the development standards as provided in the County's Zoning Ordinance. Zoning Ordinance 265.65, Article 19, Sec. 1908, provides findings that must be made to support the approval of a Conditional Use Permit. The proposed findings provided herein support the approval of the Conditional Use Permit.

During the review of the Petition to Amend, no land use planning and agricultural resource impacts, pursuant to the CEQA, were identified because there are not lands proposed for a different use than what is currently occupying or occurring on the project site or for any other affected lands.

The project's land use potential effects to surrounding property related to air quality, noise, public health hazard, or water supply have been evaluated in the sections referenced below. For a more detailed discussion see the **Air Quality**, **Noise and Vibration**, **Public Health** and **Soil and Water Resources** sections in this Staff Assessment.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

LAND-4 Prior to the start of construction, the project owner shall provide to the CPM a site plan with dimensions showing the locations of the proposed buildings and structures in compliance with the minimum yard requirements (setbacks) from the property line as stipulated in Section 406.D., yard requirements of the Kings County Zoning Ordinance.

No later than 30 days prior to the start of construction, the project owner shall provide to the CPM for approval<u>, and Kings County Planning Department for review and comment,</u> a site plan showing the HPP project in yard area compliance with Section 406.D. of the Kings County Zoning Ordinance.

REFERENCES

CEC 2002 - Henrietta Peaker Project Staff Assessment for Application for Certification, dated January 2002

GWF 2001 – Application for Certification Henrietta Peaker Project (HPP), dated August 2001

COK 2008 - County of Kings Zoning Ordinance, Number 265.65, et seq

GWF 2008 – Henrietta Peaker Project (01-AFC-18) License Amendment for Conversion to GWF Henrietta Combined-Cycle Power Plant, dated October 2008.

CCR 2008 - California Code of Regulations, Title 14, Chapter 3 (Guidelines for CEQA), §§15000-15387, as amended July 27, 2007

CPRC 2008 - California Public Resources Code, §§21000-21178, as amended January 1, 2008

GWF 2009 – Project diagrams submitted April, 2009.

NOISE AND VIBRATION ANALYSIS
Testimony of Shahab Khoshmashrab

INTRODUCTION

GWF Energy LLC's (GWF) amendment petition seeks approval to convert the Henrietta Peaker Plant (HPP) to a combined cycle power plant by adding a condensing steam turbine generator, two once-through heat recovery steam generators with selective catalytic reduction and carbon monoxide catalyst, an air-cooled condenser (ACC), an auxiliary boiler, a water treatment skid, a step-up transformer and a circuit breaker; and by modifying existing water and drainage systems.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The Energy Commission Decision (Decision) approving the HPP included four conditions of certification relating to Noise and Vibration, **NOISE-1** through **NOISE-4**.

The noise elements of the Kings County General Plan apply to this amendment. The noise requirements in the general plan have not changed since the approval of the original project.

ANALYSIS

With the exception of the following discussion related to steam blows, staff's analysis associated with the original application has not changed as a result of the proposed modification. No new sensitive noise receptors have been identified in the project area since the approval of the original project. During project operation, the existing ambient noise levels at the nearest previously-identified residential receptors would increase slightly as a result of the above modifications, but would remain in compliance with the original conditions of certification relating to Noise and Vibration and Kings County's noise requirements.

Construction activities would increase the existing ambient noise levels at the nearest residential receptors, but due to the temporary nature of these activities, staff considers the impacts to be less than significant.

The four conditions of certification included in the original Decision would still apply, with two changes, one related to noise surveying, and another related to steam blows.

NOISE SURVEYS

The ACC is expected to have six cells. Each cell would consist of a heat exchanger and an electric fan (GWF Henrietta 2008a, § 2.2.6). ACC fans are typically among the major sources of noise in a power plant, especially when all six fans are running, which occurs when plant operations levels reach 90 percent of rated capacity. Condition of Certification **NOISE-3** Verification previously required a 25-hour community noise survey to be conducted within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity (see below). In order to ensure all six ACC fans are in operation at the time of the survey, a minimum of 90 percent of plant output would

be required. Staff proposes to change Condition of Certification **NOISE-3** to reflect this requirement for the noise survey.

STEAM BLOW

The conversion of the existing project to a combined cycle plant would require steam blows.

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feed water and steam systems, the piping and tubing that comprise the steam path have accumulated dirt, rust, scale, and construction debris such as weld spatter, dropped welding rods, and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. Traditionally, high pressure steam is then raised in the boiler or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a *high pressure steam blow*, is quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam lines are connected to the steam turbine, which is then ready for operation. Alternatively, high pressure compressed air can be substituted for steam.

A newer, quieter steam blow process, referred to as *low pressure steam blow* and marketed under names such as QuietBlow™ or Silentsteam™, has become popular. This method utilizes lower pressure steam or compressed air over a continuous period of approximately 36 hours.

In order to ensure that steam blow noise would not produce significant adverse impacts, staff proposes Condition of Certification **NOISE-5** below.

CONCLUSIONS AND RECOMMENDATIONS

The proposed modification from a simple cycle peaker to a combined cycle plant will not result in significant impacts on noise and vibration. Staff recommends approval of this request and proposes the following additional condition of certification plus the following change to one existing condition of certification.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

To reflect the need to ensure all six ACC fans are in operation during the required noise survey, staff proposes the following change to Condition of Certification **NOISE-3**. In addition to the existing Conditions of Certification **NOISE-1** through **NOISE-4**, staff also proposes the following Condition of Certification **NOISE-5** related to steam blows.

NOISE-3 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that operation of the project will not cause resultant noise levels to exceed the ambient background noise level (L_{90}) at residential receivers by more than 5 dBA, and that the noise due to plant operations will comply with the noise standards of the Kings County General Plan.

No new pure tone components may be produced by operation of the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Pressure relief valves shall be adequately treated or located to preclude noise that draws legitimate complaints.

Within 30 days of the project first achieving an output of ~~80~~90 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at the same Site 1 used for the ambient noise survey (i.e., housing at NAS Lemoore). The survey shall also include the one-third octave band pressure levels to ensure that no new pure-tone noise components have been introduced. If the results from the survey indicate that the project noise level at the residential location exceeds the standards and requirements cited above, additional mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

Verification: Within 15 days after completing the post-construction survey, the project owner shall submit a summary report of the survey to the local jurisdiction, and to the CPM. Included in the post-construction survey report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures.

Within 15 days of implementation of the mitigation measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-5 If a high-pressure steam blow is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 89 dBA measured at a distance of 50 feet. The project owner shall conduct steam blows only during the hours of 8:00 a.m. to 5:00 p.m.

If a low-pressure continuous steam blow is employed, the project owner shall limit the noise of steam blows to no greater than 80 dBA measured at a distance of 100 feet.

Verification: At least 15 days prior to the first high pressure steam blow, the project owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer and the noise levels expected and a description of the steam blow schedule.

At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the projected time schedule for execution of the process.

REFERENCES

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Peaker Power Plant Application for Certification, Docket NO. 01-AFC-18, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Peaker Power Plant Application for Certification (01-AFC-18), Kings County, California, published on December 18, 2001.

PUBLIC HEALTH

Testimony of Alvin Greenberg, Ph.D.

INTRODUCTION

The GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta) project proposes to add combined-cycle capabilities to the existing simple-cycled Henrietta Peaker Plant (HPP) and increase its generating capacity by a nominal 25 MW. This analysis focuses only on the proposed changes that may affect the public health assessment. These include the proposed changes in plant operations and the installation of a new auxiliary boiler, a new diesel-fueled fire pump, and a new diesel-fueled emergency generator as part of project modifications. These proposed changes would likely cause an increase in emissions of toxic air contaminants (TACs) that could potentially create an adverse impact on public health, and thus required that staff conduct a revised health risk assessment (HRA). The new stacks' height (approximately 92 feet) also influences the dispersion of TACs and therefore must be included in the revised HRA.

In addition to evaluating health effects from the potential increase in TAC emissions, demolition and construction impacts are also evaluated. The proposed GWF Henrietta project would involve the replacement of the two existing oxidation catalyst/SCR systems and associated stacks with two new Once Through Steam Generators (OTSG) with associated stacks, a new steam turbine generator, a new air-cooled condenser, new auxiliary equipment, and several other modifications (GWF 2008a, Sections ES.3 and 3.1.2.1.1). Potential risks to public health during demolition and construction may be associated with exposure to toxic substances in contaminated soil disturbed during structure removal and site preparation, as well as emissions from construction traffic and diesel exhaust from heavy equipment operation. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are examined in staff's **Air Quality** analysis.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

There are no new LORS associated with this amendment that were not considered in staff's original analysis of the HPP. The LORS applicable to this analysis are listed below in **PUBLIC HEALTH Table 1**.

PUBLIC HEALTH Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
State	
California Public Resource Code section 25523(a); Title 20 California Code of Regulations (CCR) section 1752.5, 2300–2309 and Division 2 Chapter 5, Article 1, Appendix B, Part (1); California Clean Air Act, Health and Safety Code section 39650, et seq.	These regulations require a quantitative health risk assessment for new or modified sources, including power plants that emit one or more toxic air contaminants (TACs). The GWF Henrietta project's health risk assessment is consistent with these regulations.

ANALYSIS

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

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

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer but rather a theoretical upper-bound number based on worst-case assumptions. Staff uses a cancer risk level of 10 in 1 million, or 10×10^{-6} as a level of significance, a level consistent with those of most state air quality management districts.

The screening analysis is performed to assess worst-case risks to public health associated with the proposed project. If the screening analysis predicts no significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic site-specific assumptions, would be performed to obtain a more accurate assessment of potential public health risks.

CONSTRUCTION IMPACTS

The project owner stated that construction of GWF Henrietta would have similar impacts to those assessed by the Energy Commission for the HPP, which were found to be less than significant. Furthermore, the applicant notes that due to the newer technology present in current construction equipment and vehicle models, emissions would be reduced compared to those assessed for the HPP (GWF 2008a, Section 3.8.2.1). The applicant did not provide a health risk assessment for the diesel emissions from demolition and construction activities in its petition to amend, nor did it provide diesel particulate matter (DPM) emission factors for the equipment to be used. Staff reviewed the demolition/construction criteria pollutant and particulate matter emissions modeled by the applicant in the **Air Quality** section (GWF 2008a, Section 3.1.2.1.1) and considered the relatively short duration of the demolition/construction phase (15 months). Staff determined that diesel particulate matter (DPM) emissions should be reviewed by staff in order to evaluate public health impacts. Therefore, staff requested

that DPM emission factors for construction activities in pounds per day and tons per year be provided.

Atmospheric dispersion modeling of DPM emissions from construction equipment and vehicles was conducted by staff. The maximum annual DPM emission rate for onsite construction equipment and vehicles was provided by the project owner in Data Response #7 (GWF 2009) as 0.75 ton/year or 1,500 lbs/yr. The Hotspots Analysis and Reporting Program (HARP) model and screening met data were used and emissions were modeled as a volume source with vertical dimension of 19.7 feet, horizontal dimension of 178 feet and release height of 8 feet. The horizontal dimension is based on the assumption made by staff that active construction at any one time will occur on 25 percent of the 2.9 acres that would be added to the existing 7 acre HPP site during the GWF Henrietta project construction (Section 3.1.2.1.1 of the Petition to Amend)[17]. The construction phase of the project conversion is expected to last 15 months. The maximum predicted offsite concentration of diesel particulate matter was 1.1 ug/m^3 (approximately 20 meters outside the fenceline). In staff's analysis, cancer risk due to diesel emissions was determined using HARP and adjusted by the exposure duration of 15 months of a 70 year lifetime (15 months/840 months = 0.018). Cancer risk at the location of the maximum offsite concentration was determined to be 6.4 in 1 million. The chronic Hazard Index is 0.22, indicating no noncancer health impacts would exist due to emissions of DPM from construction activities. The procedure, assumptions, and results of this analysis are presented in **PUBLIC HEALTH Table 2**.

PUBLIC HEALTH Table 2
Staff's Analysis of Construction Equipment Diesel Emissions and Risks

Annual DPM emissions during construction period:	1,500 lb/yr
Maximum DPM concentration predicted off-site:	1.1 ug/m^3
Risk at location of maximum concentration:	6.4 in 1 million

Potential impacts to public health from disturbance of site soils that contain hazardous wastes would be mitigated by the existing Condition of Certification **WASTE-2,** which requires an environmental professional to be available during soil excavation and grading to ensure proper handling and disposal of any contaminated soil that may be encountered. The condition was mandated in the Energy Commission's decision approving construction and operation and the HPP, and will continue to apply to GWF Henrietta. See the staff assessment section on **Waste Management** for a more detailed analysis of this topic.

OPERATION IMPACTS

The applicant's health risk assessment prepared for the GWF Henrietta project includes TACs emissions associated with the 8,000 hours of operation for which HPP was originally licensed, plus 541 hours of start-up and shutdown operations as specified in

[17] In order to ensure that risks to public health due to construction vehicle emissions were not under-estimated, staff assumed that all the planned construction equipment will be in use at any one time in the smallest area feasible during construction, which was determined to be approximately 25 percent of the area of the added project site. In staff's view, this assumption would provide a "worst-case" emissions scenario for the analysis.

the GWF Henrietta amendment, the new auxiliary boiler, the new diesel-fired fire pump, and the new diesel-fired emergency generator. The applicant's screening analysis was performed using the Air Resources Board/ Office of Environmental Health Hazard Assessment (ARB/OEHHA) Hotspots Analysis and Reporting Program (HARP) in conjunction with the American Meteorological Society/EPA Regulatory Model (AERMOD) air dispersion model (GWF 2008a, Section 3.8.2.2).

The applicant's screening health risk assessment resulted in a maximum acute Hazard Index (HI) of 0.51 and a maximum chronic HI of 0.05 (GWF 2008a, Sections 3.8.2.2.1 and 3.8.2.2.2). Both acute and chronic hazard indices are less than 1.0, indicating that no short- or long-term adverse health effects are expected.

The total worst-case individual cancer risk calculated by the applicant at the point of maximum impact (PMI) was 2.2 in 1 million, which is below the level of significance (GWF 2008a, Section 3.8.2.2.3). These results are summarized in **PUBLIC HEALTH Table 3.**

PUBLIC HEALTH Table 3
Operation Hazard/Risk at Point of Maximum Impact: Applicant Assessment

Type of Hazard/Risk	Hazard Index/Risk at PMI	Significance Level	Significant?
Acute Noncancer	0.51	1.0	No
Chronic Noncancer	0.05	1.0	No
Individual Cancer	2.2 in a million	10.0 in a million	No

Source: GWF 2008a, Section 3.8.2.2

Staff conducted a quantitative evaluation of the risk assessment results presented in the petition to amend the HPP license for conversion to a combined-cycle facility. Emitting units include two natural gas-fired combustion turbines/ OTSGs, a diesel-fueled emergency generator, a diesel fire water pump, and an auxiliary boiler, for a total of five emitting sources evaluated at the proposed facility.

Staff's quantitative analysis of facility operations included the following:

- Stack parameters, building parameters, emission rates and locations of sources were obtained from the Application for Certification (AFC) and modeling files provided by the applicant.
- Emissions from the two combustion turbine/once-through steam generator stacks, the diesel emergency generator, the diesel fire water pump, and the auxiliary boiler were included in the analysis.
- Used a receptor grid of -1200 to 1200 m east and -1200 to 1200 m north, at 100 m increments.
- Exposure pathways assessed include inhalation, ingestion of home-grown produce, dermal absorption, soil ingestion and mother's milk.

Atmospheric dispersion modeling was conducted using the ARB/OEHHA HARP model, Version 1.4a. Screening meteorological data was used, as local meteorological data compatible for use in the HARP analysis was not provided by the applicant.

The emission factors used in staff's analysis of cancer risk and hazard were obtained from the AFC and are listed in **PUBLIC HEALTH Table 4**. For cancer risk calculations using the HARP model, staff used the "Derived(Adjusted)Method." For chronic noncancer hazard, staff used the "Derived(OEHHA)Method." The location of the point of maximum impact, or PMI, determined in the applicant's modeling was quantitatively evaluated in staff's analysis (70 year residential scenario).

Results of staff's analysis are summarized in **PUBLIC HEALTH Table 5** and are compared to the results presented in the petition to amend for GWF Henrietta. Using the conservative (health-protective) approach in the HARP model and screening meteorology, acute hazard index was initially determined by staff to exceed the acute hazard index level of significance, primarily due to emissions from the diesel fire pump. Thus, acute hazard was further investigated using chi/q values from AERMOD modeling of fire pump emissions (provided by Will Walters of Aspen Environmental), specifically for the peak 1-hour location modeled. This more refined analysis showed an acute hazard index of 0.374. Contribution from the other four sources to acute hazard at the peak 1-hour location was determined using the HARP model with screening meteorology, and found to be 0.19 for the four other sources. Thus, the total acute hazard at the peak 1-hour location is estimated at 0.56. Substance-specific cancer risks are presented in **PUBLIC HEALTH Table 6** for the Point of Maximum Impact. Substance-specific acute hazards are presented in **PUBLIC HEALTH Table 7** for the location of the peak 1-hour concentration.

PUBLIC HEALTH Table 4
Emission Rates Used in the Cancer Risk and Hazard Analyses Conducted by Staff

Substance	Annual Average Emissions (lbs/year)	Maximum 1-Hour Emissions (lbs/hour)
EMISSION RATES FROM OPERATION OF EACH COMBUSTION TURBINE/OTSG		
Ammonia	5.41E+04	6.33E+00
Acetaldehyde	5.34E+02	6.25E-02
Acrolein	7.36E+01	8.62E-03
Benzene	5.18E+01	6.07E-03
1,3-Butadiene	4.95E-01	5.80E-05
Ethylbenzene	6.97E+01	8.16E-03
Formaldehyde	3.57E+03	4.18E-01
Hexane	1.01E+03	1.18E-01
Naphthalene	6.47E+00	7.57E-04
PAHs	5.45E-02	6.40E-06
Propylene	3.00E+03	3.52E-01
Propylene Oxide	1.86E+02	2.18E-02
Toluene	2.77E+02	3.24E-02
Xylene	1.02E+02	1.19E-02
EMISSION RATES FROM OPERATION OF AUXILIARY BOILER		
Acetaldehyde	1.64E+00	4.11E-04
Benzene	7.99E-01	2.00E-04
Formaldehyde	4.10E+00	1.02E-03
Toluene	6.30E-01	1.58E-04
Copper	1.58E-01	3.94E-05
Nickel	3.89E-01	9.73E-05

Note that many of these values are expressed in scientific notation. As an example, a value of 5.1E-02 means 5.1 x 10^(-02) = 5.1 x 0.01 = 0.051

PUBLIC HEALTH Table 4 (cont'd)
Emission Rates Used in the Cancer Risk and Hazard Analyses Conducted by Staff

EMISSION RATES FROM OPERATION OF►	DIESEL EMERGENCY GENERATOR *		DIESEL FIRE PUMP *	
Substance	Annual Average Emissions (lbs/year)	Maximum 1-Hour Emissions (lbs/hour)	Annual Average Emissions (lbs/year)	Maximum 1-Hour Emissions (lbs/hour)
Diesel Exhaust PM	1.51E+00	-	3.96E+00	-
Acetaldehyde	-	1.75E-02	-	1.76E-02
Acrolein	-	7.56E-04	-	7.63E-04
Benzene	-	4.15E-03	-	4.19E-03
1,3-Butadiene	-	4.85E-03	-	4.89E-03
Ethylbenzene	-	2.43E-04	-	2.45E-04
Formaldehyde	-	3.85E-02	-	3.88E-02
Hexane	-	6.00E-04	-	6.05E-04
Naphthalene	-	4.39E-04	-	4.43E-04
PAHs	-	1.25E-03	-	1.26E-03
Propylene	-	1.04E-02	-	1.05E-02
Toluene	-	2.35E-03	-	2.37E-03
Xylene	-	9.46E-04	-	9.54E-04
Chlorobenzene	-	4.46E-06	-	4.50E-06
Hydrogen chloride	-	4.15E-03	-	4.19E-03
Arsenic	-	3.57E-05	-	3.60E-05
Cadmium	-	3.35E-05	-	3.38E-05
Total Chromium	-	1.34E-05	-	1.35E-05
Hex Chromium	-	2.23E-06	-	2.25E-06
Copper	-	9.14E-05	-	9.23E-05
Lead	-	1.85E-04	-	1.87E-04
Manganese	-	6.91E-05	-	6.98E-05
Mercury	-	4.46E-05	-	4.50E-05
Nickel	-	8.70E-05	-	8.78E-05
Selenium	-	4.91E-05	-	4.95E-05
Zinc	-	5.00E-04	-	5.04E-04

* Cancer risk and chronic hazard based on annual diesel PM emissions.

PUBLIC HEALTH Table 5
Results of Staff's Analysis and the Applicant's Analysis for Cancer Risk and Chronic Hazard

	Staff's Analysis			Applicant's Analysis		
	Cancer Risk (per million)	Chronic HI	Acute HI	Cancer Risk (per million)	Chronic HI	Acute HI
PMI	2.9	0.052	0.56	2.2	0.05	0.51

PUBLIC HEALTH Table 6
Results of Staff's Analysis: Contribution to Total Cancer Risk by Individual Substances from All Sources at the Point of Maximum Impact (PMI)

Substance	CTG 1 *	CTG 2 *	AUXILIARY BOILER *	DIESEL EMER GEN *	DIESEL FIRE PUMP **	TOTAL
Acetaldehyde	1.17E-08	8.46E-09	7.51E-09			2.76E-08
Benzene	1.13E-08	8.21E-09	3.65E-08			5.60E-08
1,3-Butadiene	6.49E-10	4.71E-10				1.12E-09
Ethyl Benzene	1.33E-09	9.62E-10				2.29E-09
Formaldehyde	1.64E-07	1.19E-07	3.93E-08			3.22E-07
Naphthalene	1.70E-09	1.23E-09				2.93E-09
PAHs-w/o	2.71E-08	1.96E-08				4.67E-08
Propylene Oxide	5.29E-09	3.84E-09				9.13E-09
Nickel			1.62E-07			1.62E-07
DieselExhPM				1.24E-07	2.11E-06	2.24E-06
SUM	2.23E-07	1.62E-07	2.45E-07	1.24E-07	2.11E-06	2.87E-06

PUBLIC HEALTH Table 7
Results of Staff's Analysis: Contribution to Total Acute Hazard by Individual Substances from All Sources at the Peak 1-Hour Location

Substance	CTG 1 *	CTG 2 *	AUXILIARY BOILER *	DIESEL EMER GEN *	DIESEL FIRE PUMP **	TOTAL
Ammonia	0.0017	0.0020				0.0037
Acrolein	0.039	0.045		0.079	0.32	0.49
Benzene	3.2E-06	3.7E-06	0.000010	0.000051	0.00026	0.00033
Formaldehyde	0.0038	0.0044	0.00091	0.0082	0.033	0.050
Propylene Oxide	6.0E-06	7.0E-06				0.000013
Toluene	7.5E-07	8.7E-07	3.6E-07	1.3E-06	5.1E-06	8.4E-06
Xylenes	4.7E-07	5.4E-07		8.6E-07	3.5E-06	5.3E-06
Copper			0.000033	0.000018	0.000074	0.00013
Nickel			0.0014	0.00029	0.0012	0.00282
HCl				0.000039	0.00016	0.00020
Arsenic				0.0034	0.015	0.019
Mercury				0.00049	0.0020	0.0025
SUM	0.045	0.051	0.0023	0.088	0.37	0.56

* Acute HI for combustion turbines, auxiliary boiler and diesel emergency generator derived from HARP model with screening meteorology

** Acute HI for diesel fire pump derived using AERMOD-generated chi/q values to determine ground level concentration and subsequent acute hazard.

CUMULATIVE IMPACTS

The applicant contacted the Kings County Planning Department for a list of projects that may contribute to a cumulative impact. According to the applicant, the Kings County Planning Department identified no projects within 1 mile of the GWF Henrietta site that fit the criteria for potential cumulative impacts. The applicant noted that there are also no sensitive receptors or residences within 1 mile of the GWF Henrietta site (GWF 2008a, Section 3.8.3).

As described above, the contribution of the GWF Henrietta project to both cancer risk and chronic and acute noncancer disease are comparatively very small. Staff concludes that the proposed GWF Henrietta project would not contribute to cumulative impacts in the area of public health.

CONCLUSIONS AND RECOMMENDATIONS

Staff has analyzed the potential public health risks associated with the construction and operation of the amended GWF Henrietta project and does not expect any significant adverse cancer, short-term, or long-term health effects to any members of the public from project toxic emissions. Staff also concludes that its analysis of potential health impacts from the proposed GWF Henrietta project uses a conservative health-protective methodology that accounts for impacts to the most sensitive individuals in a given population, including newborns and infants. According to the results of staff's health risk assessment, emissions from the GWF Henrietta would not contribute significantly or cumulatively to morbidity or mortality in any age or ethnic group residing in the project area. Staff also concludes that construction and operation of the amended GWF Henrietta project will be in compliance with all applicable LORS regarding long-term and short-term project impacts in the area of **Public Health**.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

None proposed.

REFERENCES

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Peaker Project, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 10, 2008.

GWF Energy (GWF Energy LLC/CH2MHILL). 2009 Henrietta Peaker Project, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power, Data Responses Set 1, 2009.

SOCIOECONOMICS
Testimony of Hedy Koczwara

INTRODUCTION

The proposed amendment seeks to add combined-cycle capability to the existing 95-megawatt (MW) Henrietta Peaker Plant (HPP). The proposed amendment would increase the peak construction workers from 93, which was presented in the 2001 Application for Certification (AFC) application, to 157, or by 64 workers. In addition, 14 new employees would be necessary to operate and maintain the proposed GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta). Construction is proposed to take place over a 15-month construction period from February 2011 through April 2012.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) COMPLIANCE

There are no changes to Socioeconomic LORS applicable to the modifications associated with the HPP License Amendment for conversion to the combined-cycle operations.

ANALYSIS

Staff has reviewed the petition for potential environmental effects and consistency with applicable LORS. In its 2001 Socioeconomics analysis, Energy Commission staff concluded that HPP would not cause a significant adverse direct or cumulative impact on schools, housing, law enforcement, emergency services, hospitals, employment, or public services and utilities (CEC 2001).

An environmental justice analysis was performed per Executive Order 12898 because low-income and high-minority populations existed in the area. In its final decision, the Energy Commission found that because there were no identified significant, project-related, unmitigated, adverse human health or environmental effects, no significant adverse impacts to minority or low-income populations were expected to occur (CEC 2002).

Staff concluded that the project would provide a temporary benefit to Kings County in terms of an increase in local jobs and commercial activity during the construction of the facility. However, because as much as 85 percent of the workforce would come from outside of Kings County, the positive impact on local employment would be reduced. Staff concluded that the project would have a positive socioeconomic impact on the Kings County area and would be consistent with all applicable Socioeconomic LORS.

POPULATION AND EMPLOYMENT

The proposed amendment would increase the peak construction workers from 93, which was presented in the 2001 Application for Certification (AFC) application and assumed in the 2001 analysis, to 157, or by 64 workers. In addition, 14 new employees would be necessary to operate and maintain the proposed GWF Henrietta. Currently,

the HPP is unmanned during normal operations, and operations and maintenance staff are dispatched from Hanford Energy Park Peaker when necessary.

Kings County has a limited number of construction workers. Based on the experience of the Applicant, the majority, if not all, of the construction workers are expected to come from outside of Kings County and would commute daily (GWF 2008).

As is demonstrated in **SOCIOECONOMICS Table 1**, occupational employment statistics from the California Employment Development Department (EDD) indicate that the labor force in Kings, Kern, Tulare, and Fresno Counties for skilled occupations associated with power plant construction totaled an estimated 26,680 workers in the first quarter of 2008 (EDD 2008a). In November 2008, the overall unemployment rate in the counties of Kings (11.4 percent), Fresno (12.1 percent), Tulare (12.5 percent), and Kern (10.4 percent) averaged 11.6 percent (EDD 2008b).

SOCIOECONOMICS Table 1
Occupational Employment Statistics: Labor Force by Skill (First Quarter 2008) and Workforce Required by Skill for Peak Month

Trade	Kings County (Hanford-Corcoran MSA***)	Kern County (Bakersfield MSA***)	Fresno County (Fresno MSA***)	Tulare County (Visalia-Porterville MSA***)	Peak Month Workforce Required by Skill
Boilermaker (SOC Code* 51-8021)	SOC code not listed	50	90	SOC code not listed	4
Carpenter (SOC Code* 47-2031)	SOC code not listed	1,840	2,960	790	5
Electrician (SOC Code* 47-2111)	80	2,050	1,400	480	33
Laborer (SOC Code* 47-2061)	160	3,860	3,230	940	10
Pipefitter/ Sprinklerfitter (SOC Code* 47-2152)	70	1,150	940	280	36
Painter/Insulator (SOC Code* 47-2141)	80	560	990	230	6
Bricklayer/Mason (SOC Code* 47-2021)	SOC code listed**	160	310	50	2
Operating Engineers (SOC Code* 47-2073)	230	1,250	770	380	6
Millwrights (SOC Code* 49-9044)	SOC code not listed	120	SOC code not listed	SOC code not listed	15
Ironworkers (SOC Code* 47-2221)	SOC code not listed	SOC code listed**	70	30	15
Other staff, teamsters, and indirect craft	-	-	-	-	57

* Standard Occupational Classification (SOC) code for U.S. Department of Labor. Codes correlate to the craft/skill noted in this table.

** The SOC code was listed in the EDD Labor Market Information data; however, EDD stated that an estimate of employment could not be provided.

*** MSA = Metropolitan Statistical Area

Source: EDD 2008a.

Construction is proposed to take place over a 15-month period, from February 2011 through April 2012. Although several of the occupations, such as millwrights and ironworkers, have a limited number of estimated workers, this would not be seen as significant, as this demand would be for a relatively short period of time, and many of the skilled construction workers typically travel from job site to job site during the construction season. The overall peak workforce of 157 worker is relatively small; and based on the number of available workers in the four counties as listed in Socioeconomics Table 2, staff concurs with the applicant that an adequate supply of workers is available to construct the combined-cycle plant.

According to the Kings County Planning Department, no proposed or foreseeable developments are planned within one mile of the project site (GWF 2008). However, an expansion of the Leprino Foods Company facility, which is the largest mozzarella cheese plant in the United States, is currently underway. The facility is located approximately 6 miles northeast of the GWF Henrietta site in Lemoore (Salyer 2009). Because the expansion is expected to be completed prior to construction of GWF Henrietta, and construction of food processing and distribution facilities require a specialized workforce, an adverse impact on labor is not expected.

In addition, the Hanford Energy Park Peaker (01-EP-07) is located approximately 25 miles east of the site. This plant, also owned by GWF, is also being reviewed for conversion to a combined-cycle plant by the Energy Commission. The construction schedule for GWF Henrietta, with its expected peak workforce of 154 workers, is expected to coincide with construction of GWF Hanford. Because both projects are proposed by the same applicant and their construction timelines are similar, it is possible that a similar workforce would be employed and the construction schedules would be coordinated. Regardless, there are enough workers in the four-county area that the project modifications would not result in any problems with labor availability for other construction projects.

HOUSING

The Kings County 2006 population was estimated to be approximately 149,758 with 39,128 households (CDF 2006). According to the 2006 California Department of Finance data, there were an estimated 2,314 vacant housing units in the county, which is a 5.7 percent vacancy rate (CDF 2006). Even with the workforce of 157 construction workers and 14 new permanent employees, if all 171 workers were to relocate to Kings County and each were to singly occupy a household, this would comprise only 0.4 percent of the total households and 0.1 of the estimated population base in the county.

However, most construction workers would commute daily and/or would reside in motels during the workweek and return home on weekends. In the area in and around the city of Lemoore, rentals for one- and two-bedroom apartments and duplexes range from $550 to $750 per month, and houses range from $900 to $1,300 per month. There are four mobile home parks and three motels in Lemoore, with a total of 203 rooms. In addition, the area in and around the city of Hanford, approximately 15 miles to the east of Lemoore, has five mobile home parks, eight motels, and one inn, for a total of 285 rooms. The city of Corcoran, approximately 30 miles southeast of Lemoore, has three mobile home parks and two motels with 40 total rooms in the community area. (Kings

County EDC 2006). As a result, the proposed upgrade to a combined-cycle plant would result in a minimal impact on housing supply and/or room availability.

FISCAL AND NON-FISCAL IMPACTS

The proposed amendment would result in an increase in the economic benefits from the project, because of its contribution to local employment and taxes, and in terms of local purchases both during construction and operation. The GWF Henrietta project has a projected construction cost of $79.3 million, of which $23.5 million would be paid out as wages and salaries, including benefits (GWF 2008).

Sales tax revenues for Kings County would increase as a result of construction and operation of the proposed project and due to increased retail sales in the area (that is, gas, food, and lodging from construction and operation worker purchases and from supplies purchased locally). Beyond Kings County, employment of construction personnel would be beneficial to local businesses and the regional economy through increased expenditure of wages for goods and services in the four-county area.

Although most of the major equipment for the project would be purchased outside Kings County for installation at the project site, about $1.2 million worth of project construction-related materials would be purchased within Kings County (GWF 2008). Kings County's sales tax rate is 7.25 percent, thus the GWF Henrietta project would generate approximately $87,000 in sales tax revenue to the State of California. Most of this revenue ($75,000) would go to the State of California. An estimated $9,000 would be retained by the county and $3,000 would be distributed to the Transportation Fund (GWF 2008).

Permanent disturbance would expand the existing 7-acre HPP site to a total of 9.86 acres, resulting in an additional 2.86 acres of permanent disturbance on the GWF-owned 20-acre parcel (GWF 2008). However, according to Kings County Planning Department, because the GWF Henrietta project would be an expansion of an existing facility, no additional impact mitigation fees would be required at the county level with the proposed amendment (Zumwalt 2009).

The proposed GWF Henrietta project is expected to also bring increased property tax revenue to Kings County. The general tax levy for Kings County is 1.0 percent of the assessed value of the property by the California State Board of Equalization. Assuming that the assessed property tax value of the project would increase by the value of the construction costs ($79.3 million), the increase in property tax value is estimated to yield approximately $800,000 in local property tax revenues to Kings County annually (GWF 2008).

A summary of the data and fiscal information is included in **SOCIOECONOMICS Table 2** below.

SOCIOECONOMICS Table 2
Fiscal, Non-Fiscal, and Demographic Data and Information

Total Project Capital Costs	**$79.3 million**
Payroll (construction)*	$23.5 million for 15 months (2008 dollars)
Estimate of Regionally Purchased Equipment and Materials	$1.2 million
Estimated Sales Tax	$87,000 (Total) $75,000 (State of California) $9,000 (County) $3,000 (Transportation Fund)
Estimated School Impact Fee	$11,080
Estimated Annual Property Taxes	$800,000
Direct Employment	
Construction (peak)	157 jobs
Operation	14 employees
Secondary Employment	Not estimated
Direct and Secondary Income	Not estimated
Average Unemployment Rates (November 2008, not seasonally adjusted)	Kings County – 11.4 percent Fresno County – 12.1 percent Kern County – 10.4 percent Tulare County – 12.5 percent
Percent Minority Population (6-mile radius)	51.58 percent based on the 2000 Census.
Percent Poverty Population (6-mile radius)	12.47 percent based on the 2000 Census.

Source: GWF 2008; EED 2008b; Dial 2009; US Census 2000.
* Operational payroll has not been estimated.

PUBLIC SERVICES

EDUCATION

The project site is located within the boundaries of the Central Union Elementary School District, which has four elementary schools, and the Lemoore Union High School District (LUHSD), which has one high school, two continuation schools, one alternative, and one community day school (CDOE 2009). During construction, most of the labor force would commute daily from within a two hour drive from Kings, Kern, Fresno, and Tulare Counties. Hence, the impact on local schools would be minimal.

For operation of GWF Henrietta, 14 new employees are expected to be hired. A worst-case scenario, using an average family size of three persons per household, would result in the addition of 14 school children to the Central Union Elementary School District (enrollment 1,941 children) and LUHSD (enrollment 2,264 children). This would result in an increase of less than 1 percent using 2007–2008 enrollments for the two districts (CDOE 2009).

Education Code section 17620 authorizes school districts to levy a fee, charge, dedication or other requirement for new development for the purpose of funding the construction or reconstruction of school facilities. Kings County requires impact fees to offset the impacts of new development. Kings County's school impact fees would apply to GWF Henrietta because even though the project would be within the existing HPP property, there would be new permanent development.

The project is within the boundaries of the Central Union Elementary School District and the LUHSD; however, those districts do not apply additional fees beyond the King's County school impact fee (Dial 2009). Currently the school impact fee for Kings County is $0.47 per square foot for commercial/industrial projects (Dial 2009). According to Table 3.12-2 in the Petition for License Amendment, approximately 23,575 square feet of new project features would be constructed on the additional 2.86 acres (124,582 square feet) of new permanent disturbance. Therefore, construction of the new features would generate approximately $11,080 in revenue for school facilities in Kings County, including those within the Central Union Elementary School District and the LUHSD.

LAW ENFORCEMENT

Kings County Sheriff's Department. The Kings County Sheriff's Department (KCSD) provides law enforcement services to the county, serves as the public administrator and county coroner, and operates the county jail in Hanford. The KCSD has 249 employees (including 20 reserve officers) and 148 sworn officers (Leist 2009). The KCSD, which is based out of its Hanford headquarters at 1444 West Lacey Boulevard approximately 18 miles northeast of the project site, has mutual-aid agreements statewide. The response time to the project site would be a maximum of 15 to 20 minutes, and it would be quicker if the deputy in the area is available (Putnam 2009).

Because of the on-site security during construction and operation, and other safety procedures described in the Worker Safety and Public Health sections of the Petition for License Amendment, and because the operation of power plants require little in the way of law enforcement, staff agrees with the 2001 Socioeconomic analysis and concludes that the even with the increased temporary and permanent workforce, existing law enforcement resources would be adequate to provide services to the GWF Henrietta project during construction and operation.

MEDICAL SERVICES

The project site would be served by the Kings County Fire Department (KCFD), which is headquartered at 280 North Campus Drive in the city of Hanford and has 10 fire stations and one supply center countywide. KCFD has 61 paid professionals and 100 volunteer firefighters (KCFD 2009).

The Lemoore Naval Air Station (NAS) Fire Department is located approximately two miles north of the site, would be the closest fire station to GWF Henrietta, and could arrive to the site within a few minutes. Through a mutual aid agreement, KCFD would request that Lemoore NAS provide first response (Virden 2009). KCFD Station #7, located approximately 7.5 miles from the site, is the closest KCFD station and it would have an estimated 10-minute response time. Station #5 (in Armona) and Station #10 (in Stratford) would both provide back-up if necessary, and they would have a 13- to 15-minute response time (Virden 2009). Therefore, in the event of a major fire, trucks from all four stations would be dispatched and they all would be at the project site within approximately 15 minutes.

American Ambulance is the sole 9-1-1 paramedic ambulance provider within Fresno and Kings Counties. The closest ambulance and staff to the site are stationed at the post in the city of Lemoore, and the second closest are in the city of Hanford (AA 2009).

The project site is considered to be within a rural response zone, and so the response time could be up to 20 minutes; however, it could be faster (Giannone 2009).

The closest hospital to the GWF Henrietta site is located in Hanford. Construction of the New Hanford Hospital, a 142-bed medical center, started in September 2007 at Seventh Street and Mall Drive in Hanford (approximately 16 miles northeast of the project site). Services from Hanford's two main hospitals, Adventist Health's Hanford Community Medical Center and Central Valley General Hospital, will move to the new site once it is complete (Adventist Health 2009). Construction of the New Hanford Hospital is expected to be completed in 2010 prior to the start of the proposed GWF Hanford construction, and thus it is assumed that the New Hanford Hospital would be the closest medical facility to the project site during construction and operation.

The city of Hanford's two main hospitals that are currently in operation are: Central Valley General Hospital, located at 1025 N. Douty Street with 49 acute care beds; and Adventist Health's Hanford Community Medical Center, located at 450 N. Greenfield Avenue with a 10-bed Intensive Care Unit, a 15-bed Emergency Department and a 56-bed Medical/Surgical Unit (Adventist Health 2009).

Because of the on-site security during construction and operation and other safety procedures described in the Worker Safety and Public Health sections of the petition to amend, staff agrees with the 2001 Socioeconomic analysis and concludes that the even with the increased temporary and permanent workforce, the emergency medical services resources would be adequate to meet the needs of GWF Henrietta during construction and operation.

PARKS AND RECREATION

According to its General Plan, Kings County presently owns and maintains three parks, Burris, Hickey, and Kingston, which are regionally oriented and located in the northern half of the county apart from urban concentrations. The County also maintains the Stratford community park, while the Kettleman City and Armona Community Services Districts maintain parks in each of their communities (Kings County 1996). Heritage Park and Westfield Park are located within the city of Lemoore, and the city of Hanford also has six parks. Swimming, boating, fishing, and picnicking are publicly, privately, and commercially available on the Kings River, which runs east of the project site. Staff does not expect the construction or operation workforces to have a significant adverse impact on parks and recreation because of the number and variety of parks within the regional project area. In addition, construction workers are unlikely to bring their families to a work site, and therefore are unlikely to have an adverse impact on existing park services.

CONCLUSIONS AND RECOMMENDATIONS

GWF Energy, LLC has petitioned to amend the certification of the 95- MW simple-cycle HPP by converting the facility into a combined-cycle power plant with a nominal 25 MW (net) of additional generating capacity. Construction is proposed to take place over a 15-month period from February 2011 through April 2012.

Staff has reviewed the amendment in relation to the Henrietta Peaker Plant project Staff Assessment published by the Energy Commission on December 19, 2001; the Petition for License Amendment submitted by GWF in October 2008; and the Final Decision adopted by the Energy Commission in March 2002. In addition, staff supplemented its review with its own independent socioeconomic analysis and determined that the proposed amendment is consistent with Socioeconomic LORS and no new or modified conditions of certification would be necessary. Based on staff's 2001 Socioeconomics analysis and staff's review of the proposed amendment, staff concludes that even with an increased workforce, the proposed amendment would not result in a significant adverse direct or cumulative impact on schools, housing, law enforcement, emergency services, hospitals, employment, or public services and utilities, including recreational facilities. In addition, no significant adverse impacts to minority or low-income populations are expected to occur.

Staff also concludes that the project would have a positive socioeconomic impact on the project area of the counties of Kings, Fresno, Tulare, and Kern. Benefits of the project include economic benefits resulting from increased employment in the four-county area during the construction and operation of the plant. Of the $79.3 million projected construction cost, the applicant estimates that $23.5 million would be paid out as wages and salaries, including benefits (GWF 2008). In addition, fiscal benefits also include approximately $87,000 in sales taxes, and approximately $800,000 in annual property taxes collected by Kings County (GWF 2008). In addition, a school impact fee would be assessed for approximately 23,575 square feet of new project features on 2.86 acres outside of the existing site. The new development would result in approximately $11,080 of revenue for school facilities in Kings County, including school facilities within the Central Union Elementary School District and the Lemoore Union High School District (Dial 2009).

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff has proposed no new Socioeconomic Conditions of Certification or modifications to the original Condition of Certification **SOCIO-1**, which requires that the project owner pay the one-time statutory school facility development fee.

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SOIL AND WATER RESOURCES
Testimony of Mark Lindley, P.E.

INTRODUCTION

This section analyzes potential impacts to soil and water resources from the construction and/or operation of the GWF Henrietta Combined Cycle Power Plant (GWF Henrietta). The analysis specifically focuses on the potential for the project to cause impacts in the following areas:

- Whether the project's use of surface water would cause a significant or potentially significant adverse change in the quantity or quality of groundwater or surface water.
- 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 increase flood hazards in the vicinity of the project.
- Whether the project would comply with all applicable laws, ordinances, regulations and standards.

The existing Henrietta Peaker Plant (HPP) is permitted for maximum water use of 160 acre-feet per year (afy) primarily for evaporative cooling, combustion turbine generator (CTG) injection, NO_x emission control, and power augmentation (CEC, 2002). Water is currently supplied by surface water entitlements from the State Water Project (SWP) and Federal Central Valley Project (CVP) delivered to the site via an existing pipeline and standpipe adjacent to the site. In 2008, HPP used about 17.0 acre-feet over 1,251 total operating hours for both turbine generators, which was the highest annual water use on record for the project (GWF, 2009a).

The proposed project, GWF Henrietta, includes conversion of the existing HPP from a simple-cycle plant to combined-cycle operation by adding two Once-Through Steam Generators (OTSGs) and a 25-MW steam turbine, increasing net generation from the facility to 120 MW without increasing fuel use. GWF also proposes to install an air-cooled condenser (ACC) to allow use of dry cooling at the converted plant, as well as a wet-surface air cooler (WSAC) for lube-oil cooling. GWF proposes to increase the maximum estimated water use at the plant to from 150 afy to 158 afy, to provide makeup water for the OTSGs and cooling water for the WSAC. This represents an increase of 141 afy as compared to the "as operated" water use for 2008.

GWF Henrietta proposes to locate the new ACC, water treatment building, fire water storage tank, and steam turbine generator and associated equipment on the eastern portion of the existing HPP site at the existing stormwater retention basin. The proposed modifications to the site layout require that the stormwater retention basin move further east on the site, increasing the disturbed area of the project site.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) COMPLIANCE

The applicable laws, ordinances, regulations, and standards that pertain to soil and water resources are presented in **SOIL & WATER RESOURCES Table 1** below.

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

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.
Resource Conservation and Recovery Act	The Resource Conservation Recovery Act (RCRA) of 1976 (40 CFR Part 260 et seq.) seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
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	The State Constitution 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.
The Porter-Cologne Water Quality Control Act of 1967, Water Code Sec 13000 et seq.	Requires the SWRCB and the nine RWQCBs to adopt water quality criteria to protect state waters. Those regulations require that the RWQCBs issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable. Requirements specifying conditions regarding the construction, operation, monitoring and closure of waste disposal sites, including injection wells and evaporation ponds for waste disposal.
California Water Code (CWC) Section 13550	CWC Section 13550 requires the use of reclaimed water for industrial purposes subject to reclaimed water being available and meeting certain conditions such as the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, and the use is not detrimental to public health.
California Water Code (CWC) Section 13552.6	CWC Section 13552.6 prohibits the use of domestic water for cooling towers if suitable recycled water is available.
Recycling Act of 1991 (Water Code § 13575 et esq.)	The Water Recycling Act of 1991 encourages the use of recycled water for certain uses and establishes standards for the development and implementation of recycled water programs.
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 Water Code Section 13260	Requires filing with the appropriate Regional Water Quality Control Board (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 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.
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 RWQCB administers the requirements of the Act.
Local LORS	
Kings County Well Ordinance	Provides requirements for well construction for the protection of groundwater quality in the county.
County of Kings Kings County General Plan – Resource Conservation Element	Sets forth policies that address the protection of soil and prime agricultural farmland. Soil resource policies, which are intended to maintain agricultural productivity, are administered largely by the Resource Conservation District rather than by Kings County. http://www.countyofkings.com/planning/Plan/GeneralPlan/05genplanresourceconsevationelement.pdf
Tulare Lake Basin Water Storage District – Rules and Regulations	Sets forth rules and regulations governing the allocation of water within the district and the transfer of water to water users outside the district and between water users within the district. The rules and regulations specifically prohibit increased groundwater pumping as a result of transfers within or out of the district.
State Policies and Guidance	
State Water Resources Control Board (SWRCB) Res. 09-11	State Water Resources Control Board Resolution 09-11 encourages and promotes recycled water to replace the use of potable water use for non-potable purposes. The policy supports the sustainable use of surface water and groundwater and encourages the use of recycled water where this water is not being put to other beneficial uses. The policy provides for a streamlined permitting process for recycled water use with local Regional Water Quality Control Boards.
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.
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".

ANALYSIS

SETTING

The proposed project, GWF Henrietta, includes conversion of the existing Henrietta Peaker Plant (HPP) from a nominal 95-megawatt (MW) simple-cycle power plant into a combined-cycle power plant with a nominal generating capacity of 120 MW net. GWF Henrietta is located on the southwest quarter of Section 34, Township 19 South, Range 19 East at about 225 feet above MSL. The project site is in northern Kings County south of the city of Lemoore, approximately 36 miles south of Fresno, California. The site is about one mile south of State Route 198 on the eastern side of 25th Avenue, just south of the adjacent Pacific Gas & Electric (PG&E) Henrietta Substation.

REGIONAL WATER RESOURCES

The GWF Henrietta site is located in the south central portion of the Central Valley (or San Joaquin Valley) of California. The Central Valley is a broad, flat valley over 450 miles long and up to 100 miles wide, bounded by the Sierra Nevada range to the west, the Coast range to the east, the Tehachapi Mountains to the south, and the Klamath and Cascade ranges to the north.

The site is set on alluvial fan deposits associated with the Kings River, which is located about 6 miles east of the site. Historically, the area supported shallow, meandering sloughs and creeks draining the foothills and Sierra Nevada Mountains to the west. The major rivers that flow into the southern end of the San Joaquin Valley including the south fork of the Kings River, Kaweah River, and Tule River, discharge to the Tulare Lake Bed, though during the growing season almost all the water in these rivers is used for irrigation, with only the tailwater flowing into the Tulare Lake Bed. The Tulare Lake Bed, which is about 8 miles southeast of the site, does not have an external drainage.

The State Water Project diverts water from the Kings River at the Pine Flat Dam east of State Route 99, upriver from the location of the river fork. The Kings River North Fork flows towards the San Joaquin River; however, the State Water Controller only directs flows to the north fork during seasonal flood releases. The majority of flows in the Kings River are routed to the Kings River South Fork and into a series of irrigation ditches and canals for agricultural uses in the southern San Joaquin Valley.

The Crescent Ditch, which runs parallel to Avenal Cutoff about 0.7 miles southeast of the site, is the nearest drainage ditch to the project site. Approximately 0.5 miles east of the project site are a series of sewage treatment ponds owned and operated by the Lemoore Naval Air Station. The project site is not within any federally delineated 100- or 500-year floodplain (GWF, 2001a).

Within Kings County, surface flows and groundwater provide water supply for domestic, agricultural and industrial uses. Total water use in the county is estimated to be about 1.4 million afy (GWF, 2001a). About one third of the total county water supply is provided by groundwater with the remainder from the Kings River and State Water Project (GWF, 2001a).

CLIMATE

The climate in the Lemoore-Hanford area is Mediterranean-subtropical and is considered warm desert, with mild winters and dry summers. Rainfall occurs primarily in the winter months between October and May, and average annual rainfall is 8.2 inches (GWF, 2001a). Summers are hot and dry with average high temperatures in the mid to upper 90's in July and August. The winters tend to be foggy and cool, with average highs in the 50's and average lows in the 30's. Average pan evaporation in the Hanford area is 79 inches per year as measured at the Corcoran El Rio station (RWQCB, 2007).

SURFACE WATER

The GWF Henrietta site is located in the Tulare Lake hydrogeologic basin, which includes the southern San Joaquin Valley. Surface water in the southern San Joaquin Valley is managed for agricultural uses and, to a lesser extent, municipal and industrial uses. The SWP and federal CVP transport water to the region via the California Aqueduct and Delta-Mendota Canal, respectively.

Water from the San Joaquin-Sacramento Delta is pumped into the California Aqueduct and Delta-Mendota Canal at the Tracy Pumping Plant. The California Aqueduct (operated by the SWP) transfers water south and into the O'Neill Forebay. The CVP's Delta-Mendota Canal also transfers water south and includes a lateral allowing flow into O'Neill Forebay for temporary storage. The O'Neill Forebay serves as an equalizing basin for the larger San Luis Reservoir operated jointly by the SWP and CVP. During periods of excess flow in the winter and spring, water is pumped from the O'Neill Forebay into the San Luis Reservoir. During the summer and fall, water is released from the San Luis Reservoir into the O'Neill Forebay and flows south in the San Luis Canal/California Aqueduct, or back into the Delta-Mendota Canal, to support irrigation and other uses (USBR, 1994). The San Luis Canal is the portion of the California Aqueduct that extends 102.5 miles from the O'Neil Forebay, near Los Banos, to a point west of Kettleman City and is operated jointly by the SWP and CVP (GWF, 2001b); the California Aqueduct continues on from Kettleman City to the pumping stations lifting the SWP water over the Tehachapi Mountains, and into three branches that provide water for irrigation and urban water users in the greater Los Angeles area.

The Westlands Water District (WWD) delivers SWP and CVP water to the project site through a buried pipeline network within the San Luis unit of the CVP. Water is supplied to the area via the San Luis Canal, a concrete lined channel with a capacity ranging

from 8,350 to 13,100 cfs (GWF, 2001b). The San Luis Canal passes GWF Henrietta about 5 miles west of the project site (GWF, 2001b).

Kings County is a contractor for water with the SWP. SWP water is combined with CVP water in the San Luis Canal. Kings County has access to 9,305 acre-feet of Table A entitlement water annually subject to allocation (DWR, 2009). In 2009, SWP allocations are estimated to be 40 percent of the requested amounts (DWR, 2009).

GROUNDWATER

The GWF Henrietta site is located in the Tulare Lake groundwater basin, which has a surface area of approximately 525,000 acres and a storage capacity of about 1,500,000 acre-feet (GWF, 2001a). Groundwater pumping in the basin is primarily for agricultural uses. Average annual groundwater pumping is about 648,000 afy, with about 24,000 afy pumped for urban and industrial uses and the remainder for agricultural uses (GWF, 2001a).

The California Department of Water Resources (DWR) has determined that the Tulare Lake groundwater basin is currently experiencing critical over-draft conditions. DWR estimates that pumping is about 229,000 afy greater than the estimated safe yield of the aquifer (GWF, 2001a). To address the existing over-draft conditions, numerous irrigation districts, water agencies, and cities in the Kings River area are cooperating with State agencies including California Department of Fish & Game and DWR on groundwater management efforts. Beginning in the 1930's, irrigation districts established percolation basins to help recharge groundwater storage. Since then, the efforts have been expanded to include up to 3,800 acres of recharge ponds with a capacity to recharge up to 87,000 afy in addition to the recharge provided by several thousand miles of unlined canals (ACWA, 2004).

The aquifer system in the vicinity of the GWF Henrietta site generally consists of an upper and lower aquifer. The Corcoran Clay layer, a 50 to 100 feet thick silty, diatomaceous clay layer with low permeability separates the upper and lower aquifer at about 450 feet below ground surface (GWF, 2001a). The upper aquifer includes interbedded sands and clays under confined to semi confined conditions. The lower aquifer also consists of interbedded sands and clays. There are up to six distinct clay beds in the region that were deposited in a lake that once occupied the San Joaquin Valley; however, the Corcoran Clay is the only significant clay bed at the GWF Henrietta site.

In general, clay layers like the Corcoran Clay layer form aquitards that restrict vertical movement of groundwater. In the Tulare Lake groundwater basin, numerous wells penetrate both the upper and lower aquifers. Since these wells typically do not include a seal at the clay layer between the upper and lo0s01month of construction, water use is expected to be about 2,900 gallons per day as a new retention basin is excavated and the existing retention basin is backfilled. During the remaining 13 months of construction, GWF estimates that average daily water use would be approximately 1,000 gallons per day primarily for dust control. Maximum construction period water use is estimated to be approximately 6,000 gallons per day for flushing and commissioning of the water treatment systems and the OTSG's. Based on the average water use estimates, total construction water supply would be about 1 acre-feet for the 14 months of construction.

Construction water supply would be provided by surface water obtained from GWF's CVP and SWP water entitlements.

Wastewater generated during construction would be collected, treated in a mechanical vapor recompression unit to concentrate dissolved solids, and clarified water would be returned to the site's raw water storage tank. Concentrated slurry would be stored in a waste-water storage tank and hauled off-site for disposal.

Project Water Supply

Water would be used at GWF Henrietta for NO_x control on the existing CTGs, makeup water for evaporative cooling of CTG intake air, and power augmentation of the CTGs. Additionally, water would be used for makeup for the two OTSGs, steam turbine lubricating oil WSAC, washing the combustion turbine compressors, other process needs, fire protection, and miscellaneous plant uses. GWF Henrietta plans to utilize surface water for all process and fire protection needs (GWF, 2008). The surface water supply from the SWP and CVP would be delivered to the site from the San Luis Canal portion of the California Aquaduct via an existing pipeline and standpipe adjacent to the site on 25th Avenue (GWF, 2008). GWF Henrietta has not identified a back-up water supply. Potable water would be supplied by a local bottled water vendor.

GWF estimates that a maximum of approximately 158 afy of water would be required for GWF Henrietta process and service water requirements based on 8,000 hours of operation (GWF, 2008). This represents an 8 afy increase over the estimated maximum water use of 150 acre-feet for HPP (GWF, 2008), and is 2 afy less than the permitted maximum water use identified in the Energy Commission Decision for HPP (CEC, 2002). In 2008, HPP used about 17.0 acre-feet over 1,251 total operating hours for both turbine generators, which was the highest annual water use on record for the project (GWF, 2009a). As compared to the "as operated" condition, GWF Henrietta would require about 141 afy of additional water supply to meet process and service requirements.

Water Quality

The water quality of surface water delivered to the site from the San Luis Canal was originally provided in the HPP Application for Certification (AFC) (GWF, 2001). **SOIL AND WATER RESOURCES Table 2** documents the water quality of samples collected from the San Luis Canal near Kettleman City.

SOIL AND WATER RESOURCES Table 2

GWF Henrietta Water Quality Parameters

(unfiltered mg/L unless otherwise indicated)

Constituent	Water Quality (mg/L)
Calcium	20
Hardness, as calcium carbonate	95
Antimony	<0.005
Alkalinity, as calcium carbonate	71
Total dissolved solids	253
Conductivity	410 µmhos/cm
Sulfate	33
Chloride	56
Arsenic	0.002
Beryllium	<0.001
Boron	0.2
Fluoride	<0.01
Chromium	0.006
Copper	0.002
Iron	0.047
Lead	<0.001
Magnesium	11
Manganese	<0.005
Turbidity	10.2 (NTU)
Phosphorus-Total	0.12
Phosphorus-Ortho	0.08
Sodium	43
Zinc	<0.005
Bromide	0.16
Nitrite & Nitrate	0.66 (as N)
Diuron	0.6 (µg/L)
Simazine	0.08 (µg/L)
Diazinon	0.01 (µg/L)
2,4-Dichlorophenylacetic acid	0.365 (µg/L)

Source: GWF, 2001.

Water Treatment

Surface water delivered from the San Luis Canal would be treated for use at GWF Henrietta. The planned water treatment process includes a microfiltration system, a multi-stage reverse osmosis system (RO), and an ion-exchange system. Demineralized water would be used for steam cycle makeup, gas turbine injection for NO_x emission control, evaporative inlet cooling, WSAC makeup, and turbine wash water. Demineralized water would be stored in an existing, onsite 300,000 gallon water storage tank.

Untreated water would be used for other service water needs including fire water needs. Untreated water would be stored in a 300,000 gallon tank connected to a dedicated underground fire loop system.

Wastewater Collection, Treatment, Discharge and Disposal

GWF Henrietta would be a near zero liquid discharge project generating less than 1 gpm of wastewater (GWF, 2008). Wastewater from GWF Henrietta processes (primarily from the reverse osmosis system) would be collected and treated in a mechanical vapor recompression unit to concentrate dissolved solids. Clarified water would be returned to the site's raw water storage tank for reuse in plant processes. Concentrated slurry would be stored in a wastewater storage tank and hauled off-site for disposal (GWF, 2008).

Sanitary wastewater from sinks, toilets, and other sanitary systems would be collected and discharged to an existing 1,500 gallon onsite septic tank and discharged to a 1,000 square foot leach field (CEC, 2001). GWF Henrietta does not propose any changes to the site sanitary septic system.

Plant Drain and Oil/Water Separator

General plant drains would collect containment area washdown and discharge to sample and facility equipment drains. Water from these areas would be collected in a system of floor drains, hub drains, sumps and piping, and routed to the facility wastewater collection system (GWF, 2001).

Runoff from drains and equipment areas that could contain oil or grease would be collected and routed through an oil/water separator. The water from the separator would be routed to the raw water tank for treatment and re-use onsite (GWF, 2008). Recovered oil would be stored in a separate tank and disposed of offsite periodically (GWF, 2008).

Stormwater Runoff and Drainage

The overall topography in the Lemoore area is relatively flat. There is a general gradient in the vicinity of the GWF Henrietta site that slopes from the northwest to the southeast. Stormwater runoff in the area drains towards the Crescent Ditch, which runs along the Avenal Cutoff about 0.7 miles southeast of the site. The existing HPP site is outside of the 100-year floodplain, and the GWF Henrietta modifications would not encroach upon either the 100-year floodplain or the Crescent Ditch.

Stormwater generated on the existing HPP is captured in a series of storm drains and pipes and is discharged to an onsite retention basin located just east of the HPP. The existing basin is sized to contain runoff resulting from a 10-year 10-day storm. The retention basin relies on evaporation and percolation for the removal of stormwater between storm events.

Areas within the southern and eastern portion of the existing HPP site were used for construction parking and laydown during construction of the existing plant. Following construction these areas were regraded to direct runoff offsite and revegetated to protect existing soils from erosion.

The GWF Henrietta modifications involve expanding the existing HPP project footprint to the east to accommodate the new steam turbine, lube oil cooler, air cooled

condenser, fire water storage tank and water treatment building. The GWF Henrietta modifications would add impervious surface area within the eastern portion of the site, which would increase the volume of runoff generated onsite.

As a result of this expansion, the existing retention basin would be filled in and relocated as an expanded basin further east on the project site. GWF proposes to increase the size of the new retention basin by approximately 59,400 cubic feet or 1.36 acre-feet to accommodate the additional runoff. Soil generated by relocating and expanding the onsite retention basin would be incorporated into site grading activities.

The revegetated area in the southern portion of the site would be used for construction parking during construction of GWF Henrietta. The revegetated area in the eastern portion of the site would be used for construction laydown. Following construction, these areas would be regraded to drain away from the on-site retention basin and revegetated to limit soil erosion.

SOILS

The GWF Henrietta site lies on Kings River alluvial fan deposits. The soils at the GWF Henrietta site consist primarily of Lethent clay loam based on information from Kings County soil survey published by the Soil Conservation Service (GWF, 2001). The Lethent clay loam soil at the site is very deep, saline-alkali, and moderately well drained. The soil permeability is very slow. Runoff is usually slow and the erosion potential is slight. The soil at the site is described below in **SOIL AND WATER RESOURCES Table 3**.

The Lethent clay loam has a high concentration of salts and is alkaline. Lands on Lethent clay loam are not prime farmland even when irrigated, and the salt and alkali contents limits the soil's agricultural potential (GWF, 2001). The saline-alkali nature of the soil could contribute to corrosion of steel and concrete, and treatment of steel and concrete is recommended (GWF, 2001). The soil also has a potential for shrinking and swelling.

SOIL & WATER RESOURCES Table 3
Soil Types at GWF Henrietta

		Erosion Susceptibility		
Map Unit Number and Name	**Soil Description**	**Water**	**Wind**	**Comments**
139 Lethent clay loam, saline-alkali	Fine clay loam. Very deep and moderately well drained. Alluvium derived from sedimentary rock	Slight	Low	Permeability: moderately slow. Excavations for roads or building site pads can expose material that may be susceptible to wind and/or water erosion. Disturbed area of construction sites should be revegetated or covered with synthetic matting where needed to reduce the risk of erosion.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section provides an evaluation of the potential direct, indirect and cumulative impacts to soil and water resources that would be caused by construction, operation and maintenance of the project. The goal is to avoid any adverse impacts or minimize them to a less than significant level. Staff's analysis of potential impacts consists of a brief description of the potential effect, an analysis of the relevant project effects, and application of the threshold criteria for significance of the effects. If mitigation is warranted, staff provides a summary of the applicant's proposed mitigation and a discussion of the adequacy of the proposed mitigation. When necessary, 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 less than significant level.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff evaluated the significance of potential impacts to soil and water resources including the effects of construction and operation activities that could 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 for the project's proposed water use to cause a significant depletion or degradation of local and regional surface or groundwater water resources.

The significance of potential impacts to soil and water resources was determined based on:

- whether the project's use of surface water provided by the CVP and SWP would cause a significant, or potentially significant, adverse change in the quantity or quality of groundwater or surface water resources;
- whether project construction or operation would lead to degradation of surface or groundwater quality;
- whether construction or operation would lead to accelerated erosion and sedimentation;
- whether the project would increase flood hazards in the vicinity of the project; and,
- whether the project would comply with all applicable laws, ordinances, regulations and standards including those related to water supply for power plants.

Where the potential for impacts are identified, staff has proposed mitigation measures to reduce the significance of the impact and, as appropriate, has recommended conditions of certification.

These criteria are based on the California Environmental Quality Act (CEQA) Guidelines and performance standards (CCR, 2008). 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 AND WATER RESOURCES Table 1** represent the applicable

standards used for the GWF Henrietta 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 impacts that exceed standards or result in a significant adverse impact, conditions of certification may be necessary to ensure compliance with standards or reduce the impacts to a less than significant level.

Staff's analysis, determination of potential impacts, and evaluation of appropriate mitigation measures relies on estimates and information provided by GWF regarding the construction and operation of GWF Henrietta. Applicable scientific, technical, and LORS/policy-related literature and expert opinion were also consulted in the development of staff's analysis.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The direct and indirect impact and mitigation discussion is divided into impacts related to construction and to operation.

Construction Impacts and Mitigation

Construction of the GWF Henrietta would include soil excavation, grading, installation of utility connections and the use of water for dust suppression, moisture conditioning, and concrete mixing. Potential impacts to soils related to increased erosion or release of hazardous materials are possible during construction. Potential stormwater impacts could result if increases in runoff flow rate and volume discharged from the site were to increase flooding downstream. Water quality could be adversely affected by the discharge of eroded sediments from the site or hazardous materials released during construction. Project water demand could affect quantity of groundwater or surface water resources. Potential construction related impacts to soil, stormwater, and water quality or quantity are discussed below.

Soil Erosion

Construction activities can lead to adverse impacts to soil resources including increased soil erosion, soil compaction, loss of soil productivity, and disturbance of soils crucial for supporting vegetation. Activities that expose and disturb the ground surface leave soil particles vulnerable to detachment by wind and water. Soil erosion could result in the loss of topsoil, discharge of sediment offsite, water quality degradation, or reduced volume and infiltration capacity in the onsite retention basin.

The magnitude, extent and duration of those impacts would depend on several factors, including the proximity of the GWF Henrietta site to surface receiving waters (for instance, the Crescent Ditch), the type of soils affected, and the method, duration, and time of year of construction activities. Prolonged periods of precipitation, or high intensity, short duration runoff events coupled with earth disturbance activities can result in on-site erosion. In addition, high winds during grading and excavation activities can result in wind borne erosion leading to increased particulate emissions that adversely impact air quality. Soils at the project site are clay loam with a slight water erosion potential and low wind erosion potential. Without implementation of adequate BMPs, the project earthwork and grading activities could lead to significant fugitive dust and erosion impacts. In the Air Quality Section, proposed conditions of certification provide

mitigation that would prevent significant impacts from fugitive dust and wind borne soil erosion by requiring dust control to disturbed lands during construction.

The construction activities for GWF Henrietta are expected to last about 15 months from February 2011 through April 2012. Grading activities are expected to occur during the first five to seven months of construction, coincident with the rainy season. Grading activities would disturb about 2.86 acres of the site just east of the existing HPP power block for construction of new equipment associated with GWF Henrietta. In addition, about 4.52 acres in the eastern and southern portions of the site would be disturbed for construction laydown and parking (GWF, 2009a).

Earthwork at GWF Henrietta would include:

- removal of topsoil, vegetation, and debris;
- excavation and compaction of earth to create the plant grade for new equipment;
- excavation to expand the existing site retention basin; and
- excavation for foundations and underground systems.

Materials suitable for compaction would be stockpiled in designated locations. Materials not suitable for compaction would be stored separately and reused on site. The construction laydown and parking area may be graded and covered in gravel to facilitate construction access (GWF, 2009a).

The applicant has prepared a draft Drainage Erosion and Sediment Control Plan (DESCP) that included a list of erosion and sediment control Best Management Practices (BMPs) that would be implemented before, during, and post-construction. The applicant has proposed implementation of both source control and treatment control BMPs to limit soil erosion and the transport of eroded sediments during construction. The applicant has identified source control BMPs, including soil stabilization with mulch, seeding, straw mulch, geotextiles and stabilized construction roads to stabilize disturbed soils to limit erosion. To help trap eroded sediments, the applicant identified silt fences, sand bag barriers, straw bales, and fiber rolls, as well as sediment traps as treatment control BMPs for use during construction. The applicant proposed that all BMPs would be inspected before and after storm events and daily during extended storm events and that all measures would be maintained in good working order (GWF, 2009a).

During construction and operation the applicant would need to monitor and remove trapped sediments from the onsite stormwater retention basin to maintain infiltration rates and storage volume as needed. Following construction, temporary erosion control and treatment control BMPs would be removed from the site. In addition, gravel placed on the laydown area would be removed, and the area would be seeded and mulched to re-establish vegetation.

The discussion of the proposed BMPs including the implementation and operation were described in sufficient detail in the DESCP (GWF, 2009a). Staff believes that the draft plan is reasonable as a planning level document and that, through the proper application of the proposed BMPs, impacts to soil resources from water and wind erosion would be reduced to a level that is less than significant. Condition of Certification **SOIL & WATER-1** requires the applicant to prepare and implement a final DESCP for construction and operations to assure that these proposed BMPs are

implemented. Condition of Certification **SOIL & WATER-2** requires the applicant to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for construction activities to meet the requirements of the Central Valley Regional Water Quality Control Board (RWQCB).

Stormwater

Potentially significant water quality impacts could occur during construction, excavation, and grading activities if contaminated soil or other hazardous materials used during construction were to contact stormwater runoff and drain off-site. Water quality could also be adversely impacted if the stormwater drainage pattern concentrates runoff in areas that are not properly protected with BMPs, causing erosion of soils and discharge of sediment into down-gradient surface waters. Flooding downstream of the project site could also increase if runoff discharged from the GWF Henrietta site increases.

GWF Henrietta is located on an existing industrial site within a primarily agricultural area south of Lemoore. The area in the vicinity of project site is primarily utilized for agricultural uses, with the exception of the PG&E substation just north of the site. The area is relatively flat, drains towards the Crescent Ditch and is above the 100-year floodplain.

Currently, stormwater runoff on the existing HPP site is routed to the existing stormwater retention basin on the east side of the improved site. The primary storm drain pipes run east to west across the developed site and discharge into the existing stormwater retention basin. The pond was designed to accommodate the flows resulting from a 10-year, 10-day storm, which is the maximum total rainfall over a 10-day period with a 10 percent chance of occurring in any given year.. The runoff calculations used to support the sizing of the retention pond were based on the Rational Method as set forth in the Kings County – Department of Public Works Improvement Standards.

The applicant provided a grading plan and watershed delineation maps for GWF Henrietta. The watershed map indicates that all areas within the permanent fence along the perimeter of the GWF Henrietta site would drain to the stormwater retention pond. Runoff from the GWF Henrietta site would increase because the planned improvements include paving and construction of concrete pads expanding the plant footprint by about 2.86 acres on the eastern portion (HPP) of the project site. During construction, the stormwater pond would be relocated to the east and expanded by approximately 59,400 cubic feet or 1.36 acre-feet to accommodate the additional runoff generated from the increase in impervious area associated with GWF Henrietta (GWF, 2008). Material generated from relocating and expanding the retention basin would be retained on-site and would be incorporated into the final grading of the site.

Staff reviewed the sizing calculations provided by the applicant and verified that the expanded basin had adequate capacity to contain the runoff volume produced by a 10-year, 10-day storm as set forth by the Kings County. Staff determined that the proposed basin could contain the 10-year, 10-day runoff volume with about 1.0 feet of freeboard. The proposed basin could contain the 100-year, 10-day runoff volume without overtopping and could contain runoff volume generated by two back-to-back 100-year 24-hour design storms with about 0.77 feet of freeboard. Staff also reviewed the basin grading to determine if the California Stormwater Quality Association (CASQA) Water

Quality Volume could drain within 3 to 5 days to limit the potential for vector control issues in the basin. Assuming a 0.025 inch/hour infiltration rate for the clay loam soils at the site, Staff estimated that the Water Quality Volume would drain from the basin within about 4.3 days.

During construction, sediment eroded from the disturbed areas on the site would be trapped in the onsite retention basin. These trapped sediments can compromise the function of the retention basin in two ways. First, these sediments would decrease the storage volume available in the basin. With limited freeboard available, if sediment deposits in the basin, the available freeboard would decrease below the 1 foot minimum requirement. Since the basin is intended to contain all runoff and has no emergency outlet, maintaining the required freeboard is necessary to limit potentially significant impacts associated with overtopping. Secondly, trapped fine sediments can clog the soil voids resulting in decreased infiltration rates and increasing drainage times. Since the basin has a drainage time within the 3 to 5 day requirement to limit mosquito breeding, a significant decrease in infiltration rates could lead to mosquito breeding within the basin. To address these potential issues, staff has added a requirement to remove trapped sediment from the retention basin. Condition of Certification **SOIL & WATER-1** requires the applicant to remove accumulated sediment from the retention basin, when sediment accumulates more than 0.5 feet deep in the basin to maintain storage volume and drain times. With proper maintenance of the expanded onsite retention basin, potential impacts related to downstream flooding and water quality would be less than significant.

Stormwater runoff from the laydown area is currently discharged offsite and flows towards the Crescent Ditch. During construction, runoff from the laydown area would continue to be routed away from the site and would not discharge into the stormwater retention pond (GWF, 2009a). The DESCP stated that runoff from the laydown area would be addressed under the Construction SWPPP, which would identify pollution prevention controls and monitoring activities of stormwater discharges. Condition of Certification **SOIL & WATER-2** requires the applicant to prepare and implement a Construction SWPPP.

No significant soil or groundwater contamination issues have been identified on the GWF Henrietta site. In the draft DESCP, the applicant indicated that any contaminated soils encountered during excavation would be disposed of in accordance with applicable regulations. During construction, hazardous materials including petroleum products, paints, solvents, and other chemicals would be stored in areas with secondary containment to limit the potential for spills or leaks to contaminate adjacent soils or stormwater (GWF, 2009a). In the event of a spill, the applicant has committed to removing any potentially contaminated soils for disposal at an approved disposal site (GWF, 2009a). Implementation of proper storage and fueling procedures as detailed in the Construction SWPPP and DESCP required in Conditions of Certification **SOIL & WATER-1** and **-2** would ensure that hazardous materials utilized during construction would not lead to significant impacts to soil and water resources.

Water Supply

The total water supply during construction would be about 1 acre-feet. These estimated water supply requirements are considerably less than the existing HPP operational

water use during the past two years of operation (2007 and 2008 – GWF, 2009a). Therefore, Staff does not anticipate that the construction water supply would result in significant impacts to surface water supplies or quality.

Groundwater

The groundwater level at GWF Henrietta was approximately 6 feet below ground surface in 2001 (GWF, 2001). Thus, groundwater may be encountered in excavations and dewatering may be required during construction. Groundwater removed from excavations must be handled in accordance with procedures detailed in the construction SWPPP. All contact stormwater (the stormwater draining directly from the project's components that could be contaminated with lube oil or other substances) would be collected and stored in a holding tank and eventually trucked offsite for disposal (GWF, 2008). During construction, the GWF Henrietta site would not directly affect groundwater resources with the implementation of Conditions of Certification **SOIL & WATER-1** and **-2**. The construction SWPPP and DESCP provide specific guidelines for protecting groundwater resources through hazardous materials handling practices.

Wastewater and Sanitary Waste

During the construction period, GWF states that all sanitary waste would be collected in portable toilets (no discharge) supplied by a licensed contractor for collection and disposal at an appropriate receiving facility (GWF, 2009a). Equipment wash water would also be collected and disposed of offsite; therefore, there would be no impacts from disposal of sanitary wastewater. The wastewater from hydrostatic testing would be returned to the HPP raw water tank for recycle and reuse. Handling, storing and disposal of all construction wastewater shall be fully described in the Drainage, Erosion and Sediment Control Plan, as required in Condition of Certification **SOIL & WATER-1**.

Operation Impacts and Mitigation

Operation of the GWF Henrietta could lead to potential impacts to soils, stormwater runoff, water quality, and water supply. Soils may be adversely affected through erosion or the release of hazardous materials used in the operation of the GWF Henrietta. Stormwater runoff from GWF Henrietta could result in potential impacts if increased runoff flow rates and volumes discharged from the GWF Henrietta site increase downstream flooding. Water quality could be adversely affected by discharge of eroded sediments from the GWF Henrietta site or hazardous materials released during operation. Water supply for plant processes, fire protection, potable uses, and landscape irrigation could lead to potential impacts to quantity or quality of regional groundwater or surface water resources. Potential impacts to soil, stormwater, water quality, water supply, and wastewater related to the operation of the GWF Henrietta, including the applicant's proposed mitigation measures and staff's proposed mitigation measures, are discussed below.

Soil

The applicant has proposed seeding and/or mulch to stabilize soils and control erosion in the laydown area on the eastern portion of the site and at the construction parking area on the southern portion of the site. The applicant stated that these areas would be prepared for seeding to a depth of 3 to 4 inches through disking, harrowing, or raking. Seed would be dispersed through dry broadcasting and worked into the top soil (GWF, 2009a). The applicant has committed to obtaining 75 percent coverage on all

revegetated areas, which would limit soil erosion from the laydown area and other revegetated areas during operations. Implementation of proper revegetation and erosion control BMPs during operations as detailed in the DESCP required in Condition of Certification **SOIL & WATER-1** would reduce soil erosion related impacts to a less than significant level.

During operations, numerous hazardous materials would be stored and used onsite. The existing HPP utilizes secondary containment for chemical and petroleum storage and use areas. These secondary containment areas are surrounded by curbs or dikes to contain chemicals in the event of a spill. Secondary containment areas are sized to contain the volume of the largest storage tank to prevent overtopping. In the draft DESCP, the applicant provided basic spill prevention and cleanup plans. Hazardous materials utilized during operations would not lead to significant impacts to soil and water resources through the proper implementation of the chemical storage BMPs and spill prevention and clean-up plans as detailed in the DESCP required in Condition of Certification **SOIL & WATER-1**.

Stormwater

Staff examined several potential impacts related to stormwater during GWF Henrietta operations. Staff verified that stormwater discharge rates from the GWF Henrietta site would not exceed pre-development rates. Staff examined the applicant's proposed plans to relocate and expand the existing retention basin to determine if the basin had adequate capacity to contain the runoff generated during the design storm. Staff also reviewed the drainage time within the retention basin to confirm that operation of the basin would not lead to significant vector control impacts. In addition, staff reviewed the applicant's conceptual plans for controlling drainage to assure that appropriate BMPs are identified to avoid degradation of water quality from erosion or contact with contaminants.

Without mitigation, runoff from the GWF Henrietta site would exceed pre-development runoff due to the increase of impervious area associated with the new equipment, concrete pads, and access roads proposed for the area just east of the existing power block. The GWF Henrietta project includes relocating and expanding the footprint of the developed, industrial portion of the site by about 2.86 acres. For the 10-year, 10-day design storm, the applicant estimates that 3.27 acre-feet of runoff would be generated on the GWF Henrietta site. Staff reviewed and confirmed the applicant's estimate of runoff for the design storm (GWF, 2009b). The expanded retention basin would have a capacity of about 3.31 acre-feet at a contour elevation of 221.5 feet, which provides about 1 foot of freeboard between the design storm water surface elevation and the proposed top of the basin. Staff determined that the proposed expansion of the retention basin would provide sufficient capacity to contain the design storm event and that operation of GWF Henrietta would not increase stormwater runoff discharged offsite or increase any downstream flooding in the vicinity of the site.

Between storm events, runoff captured in the retention basin would percolate to the sub-surface or evaporate. Infiltration of stormwater generated at the project site within a retention basin is an ideal BMP to control runoff and protect downstream properties from flooding and water quality impacts. The proposed infiltration basin would meet the RWQCB standards related to water quality treatment and emerging standards to control

hydrograph modification affects. One potential issue related to operation of the proposed retention basin is related to drawdown time following storm events. As discussed in the Construction Stormwater impacts analysis, staff determined that the basin should drain the CASQA Water Quality Volume in about 4.3 days, which is sufficient to limit the potential for vector control issues associated with mosquito breeding in the basin.

Another potential issue associated with infiltration BMPs like the proposed retention basin is related to accumulation of toxic constituents in soils and groundwater. If the stormwater discharged to a stormwater retention/infiltration pond is contaminated by toxic constituents, these constituents can accumulate in the soils in the basin and may ultimately migrate to the groundwater below the basin. Given that groundwater is relatively close to the ground surface at GWF Henrietta, the potential for impacts to groundwater quality is particularly high. Staff examined stormwater quality sample results for four samples collected in the existing HPP retention basin in 2006 through 2008. Based on the limited sampling and analysis available, the sample results indicate that low levels of oil and grease (7 to 8 mg/l) and iron (5.7 to 0.8 1.89 mg/l) were present in stormwater discharged to the basin. These results indicate that the current stormwater quality control BMPs in place at HPP are not adequate to keep hydrocarbons and metals from being discharged to the stormwater retention basin. The applicant should add a vault-based BMP targeting hydrocarbons and heavy metal pollutants to the existing stormdrain pipe prior to discharge to the retention basin.

The applicant also noted GWF Henrietta is exempt from the Industrial Activities Storm Water General Permit requirements because the stormwater retention basin does not discharge offsite to a storm drain or surface receiving water. Implementation of the DESCP required in Condition of Certification **SOIL & WATER-1**, which includes maintenance of the proposed retention basin to remove accumulated sediment and utilizing a vault based treatment BMP to remove hydrocarbons and metals from stormwater, would ensure that potential stormwater related impacts are less than significant. Staff recommends that the existing Condition of Certification **SOIL & WATER-6**, which requires bi-annual monitoring of stormwater discharges to the onsite retention basin, be maintained for operation of GWF Henrietta. Staff has also added Condition of Certification **SOIL & WATER-9**, which prohibits the discharge of stormwater from the site and requires the project owner to submit a Notice of Non-Applicability to the RWQCB confirming that the project is not subject to the requirements of the General NPDES Permit for Industrial Activities. If conditions at the project site change, and the project will discharge stormwater, Condition of Certification **SOIL & WATER-9** requires the project owner to comply with the requirements of the General NPDES Permit for Industrial Activities and prepare and implement a SWPPP for project operation.

Water Supply

GWF proposes to use surface water from the CVP supplied by Westlands Water District and from the SWP supplied by the Tulare Lake Basin Water Storage District to supply water at GWF Henrietta. Staff considered the potential for the project's proposed use of surface water to cause impacts to surface water supplies or quality. Since the Tulare Groundwater Basin is already experiencing critical overdraft conditions, Staff also considered the potential for the project's use of surface water supplies associated with

agricultural uses to increase groundwater pumping leading to significant impacts to the quantity and quality of groundwater available in the area.

GWF has a 5 afy Manufacturing and Industrial entitlement with Westlands Water District associated with the GWF Henrietta site. In addition, GWF has a 33.7 afy agricultural entitlement, subject to allocation, with Westlands Water District associated with the portions of the GWF Henrietta site that are still under agricultural production (GWF, 2008). GWF indicates that Westlands Water District has verbally agreed to provide up to 51.8 afy, subject to allocation, for industrial uses at GWF Henrietta (GWF, 2008). Staff contacted Westlands Water District and confirmed that Westlands still recognizes a 51.8 afy entitlement with the GWF Henrietta site, however, GWF would need to receive permission to utilize more than 5 afy for industrial purposes (WWD, 2009).

GWF Henrietta has an entitlement for 202 afy of Kings County water, subject to allocation, from the Tulare Lake Basin Water Storage District under the SWP. GWF stated it is in negotiation to expand a 750 acre purchase option to 950 acres of land with a corresponding entitlement for 2,600 afy (GWF, 2008). GWF did not provide any further information on the land purchase options in response to staff's data requests (GWF, 2009a).

Water deliveries from the CVP and SWP are subject to allocation depending upon availability of water supplies. Water supplies in California tend to be highly variable depending upon annual snowpack and rainfall. Over the years, water supply allocations for the SWP have been at 50 percent or less of entitled amounts in 8 of the past 20 years and were 0 percent during the severe drought in 1991. Also, water supply allocations for the CVP south of the Delta have been further decreased by recent decisions to protect threatened and endangered fish species (USBR,2009).

Because of the severe 3-year drought that California is currently experiencing, allocations of CVP and SWP water were significantly curtailed in 2009. Delivery of CVP water to Westlands Water District is allocated at 10 percent of entitled amounts for 2009 (WWD, 2009). Delivery of SWP water to the Tulare Lake Basin Water Storage District is allocated at 40 percent (TLBWSD, 2009). Based on the existing agreements in place including the corresponding allocations for 2009, GWF has the right to utilize up to 85.8 acre-feet of water in 2009 (5 acre-feet from Westlands and 80.8 acre-feet from TLBWSD) for the existing HPP.

Approximately 158 afy of water would be required for GWF Henrietta process and service water requirements based on 8,000 hours of operation (GWF, 2008). This represents an 8 afy increase over the estimated maximum water use for HPP, and a 141 afy increase over the maximum and most recent actual annual water use.

Given GWF's currently in place water supplies agreements, GWF does not have sufficient water supplies to meet the estimated maximum requirement for the existing HPP or GWF Henrietta in 2009. In order to operate GWF Henrietta at maximum capacity during drought years, GWF will need to purchase and fallow additional agricultural lands to provide a minimum of 158 afy of surface water entitlements to provide a reliable supply for GWF Henrietta.

GWF Henrietta would rely on existing agricultural surface water entitlements to provide water for the project. In the absence of GWF Henrietta, these existing agricultural water entitlements would continue to be utilized for agriculture. These supplies are currently allocated through the CVP and SWP taking into account availability of supply and environmental requirements to protect fish habitat. Therefore, staff determined that the quantity and quality of existing surface water supplies within the Westlands Water District, the Tulare Lake Basin Water Storage District, and the San Joaquin Delta would not be adversely affected by the project's proposed use of surface water.

Staff recommends maintaining Condition of Certification **SOIL & WATER-3**, which requires GWF to maintain metering devices and report water use at GWF Henrietta.

Water Use Compliance Plan

The California Department of Water Resources has determined that the Tulare Lake groundwater basin is currently experiencing critical over-draft conditions. Average annual groundwater pumping is about 648,000 afy (GWF, 2000). DWR estimates that pumping is about 229,000 afy beyond the estimated safe yield of the aquifer (GWF, 2000). Given the existing critical overdraft conditions, additional pumping of groundwater within the basin could result in significant groundwater supply impacts.

The proposed water supply for GWF Henrietta consists of agricultural entitlements associated with lands that are either currently owned or under purchase option by GWF (GWF, 2008). Transfer of surface water entitlements associated with agricultural lands could induce additional groundwater pumping in the basin if agricultural users replace the surface water with groundwater to maintain agricultural production. Given the critical overdraft conditions in the basin, any increases in groundwater pumping to replace surface water entitlements would likely result in impacts to groundwater supplies. Recognizing the potential for water transfers to cause indirect impacts to groundwater supplies, the Tulare Lake Basin Water Storage District has adopted rules and regulations prohibiting water users from increasing historical groundwater pumping within the District as the result of a water transfer (TLBWSD, 2009). In addition, the Tulare Lake Basin Water Storage District has requirements related to the management of lands fallowed as a result of water transfers to limit impacts to soil resources related to erosion and agricultural productivity.

To address the potential for significant impacts related to GWF's proposed surface water entitlement transfers and to facilitate compliance with Tulare Lake Basin Water Storage District rules and regulations, staff recommends Condition of Certification **SOIL & WATER-7**, which requires preparation and implementation of an approved Water Use Compliance Plan, and limits annual water use at the plant to 158 afy. The Water Use Compliance Plan shall:

1. Identify lands with surface water entitlements to be utilized by GWF Henrietta.
2. Provide historic groundwater pumping records for all lands with surface water entitlements that may be utilized by GWF Henrietta.
3. Identify management practices to be utilized on any lands fallowed as a result of water transfers to GWF Henrietta.

4. Require annual reporting on all surface water used at GWF Henrietta as well as all surface water and groundwater used at all lands with surface water entitlements utilized by GWF.

Providing that GWF Henrietta prepares and implements a Water Use Compliance Plan that meets the requirements of the rules and regulations governing water transfers in the Tulare Lake Basin Water Storage District, impacts related to groundwater supplies and fallowing agricultural lands would be less than significant.

Wastewater

Wastewater from process streams at GWF Henrietta would be routed to the mechanical vapor recompression unit to concentrate dissolved solids. Clarified water would be returned to the site's raw water storage tank for reuse in plant processes. Concentrated slurry would be stored in a waste-water storage tank and hauled off-site for disposal at a licensed facility (GWF, 2008). Discharge rates are expected to be about 0.7 gpm of concentrated slurry and 0.95 gpm from the oil water separator (CEC, 2001). Staff recommends that the existing Condition of Certification **SOIL & WATER-5** be maintained. Condition of Certification **SOIL & WATER-5** requires GWF to provide records related to the waste hauling contractor and records on all waste water disposed offsite.

Sanitary wastewater from sinks, toilets, and other sanitary systems would be collected and discharged to an existing 1,500 gallon onsite septic tank and discharged to a 1,000 square foot leach field (CEC, 2001). GWF Henrietta does not propose any changes to the site sanitary septic system. Condition of Certification **SOIL & WATER-4** required GWF to provide design details on the onsite septic system including documentation from the Kings County Building Department addressing compliance with all county requirements. Provided GWF continues to operate the onsite septic system in compliance with county requirements, potential impacts associated with sanitary wastewater disposal should be less than significant.

Groundwater

Condition of Certification **SOIL & WATER-8** required GWF to monitor shallow groundwater at the site to determine if the shallow groundwater was of sufficient quality to have beneficial uses. Groundwater monitoring data collected in 2001, prior to construction of HPP, indicated that the shallow groundwater at the site was of relatively poor quality with elevated TDS, iron, sodium, and sulfate levels. Since this monitoring data indicated that the shallow groundwater was of relatively poor quality with limited beneficial uses, Condition of Certification **SOIL & WATER-8** has been satisfied, and further groundwater monitoring should no longer be required.

CUMULATIVE IMPACTS

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.

Temporary and permanent disturbances associated with construction of the proposed project would cause accelerated wind- and water-induced erosion. However, staff has concluded that the implementation of proposed mitigation measures as described in an

approved SWPPP and DESCP would ensure that the project would not contribute significantly to cumulative erosion and sedimentation impacts. Stormwater discharge would be retained on site and would not exacerbate flooding conditions in the area.

GWF Henrietta would use a maximum of 158 afy of surface water provided by the CVP and SWP. As described above, GWF Henrietta owns or has in place purchase options on 2,915 acres of agricultural lands with 2,802 afy of surface water entitlements in the Tulare Lake Basin Water Storage District and 51.8 afy of surface water entitlements with the project site. Since these surface water entitlements are subject to allocation based on the availability of surface water supplies and environmental requirements, water use at GWF Henrietta would not add to cumulative impacts to existing surface water supplies. Also, with the implementation of a Water Conservation Offset Plan that meets the requirements of the Tulare Lake Basin Water Storage District, GWF Henrietta would not add to existing cumulative impacts to groundwater supplies in the basin.

The wastewater discharge associated with GWF Henrietta would adhere to existing waste disposal regulations and sanitary wastewater disposal would meet Kings County requirements. Therefore, no wastewater-related cumulative impacts are expected.

COMPLIANCE WITH LORS

The Energy Commission's power plant certification process requires staff to review each of the proposed project's elements for compliance with LORS and policies.

SWRCB POLICY 75-58 AND 2003 INTEGRATED ENERGY POLICY REPORT

In accordance with the water conservation provisions established in the California State Constitution and SWRCB Resolution 75-58, the Energy Commission established a water source and use policy in its *2003 Integrated Energy Policy Report (IEPR)*, stating that "the Energy Commission would approve the use of fresh water for cooling purposes by power plants which it licenses only where alternative water supply sources and alternative cooling technologies are shown to be 'environmentally undesirable' or 'economically unsound'." In addition, California Water Code Section 13550 requires the use of recycled water for industrial purposes subject to a number of criteria including that the quantity and quality are sufficient for the use and the cost is reasonable.

Given the clear intent of the California Water Code to encourage recycled water use for industrial processes and the intent of State Water Resource Control Board and Energy Commission polices to require the use of recycled water where environmentally beneficial and economically feasible, Staff examined GWF Henrietta's proposed use of surface water supplied by the CVP and SWP. Staff addressed three primary questions related to the project's proposed use of surface water as compared to the use of other lesser quality water sources:

1. Is recycled water or agricultural wastewater available in sufficient quantities for the project's water supply?
2. Could recycled water or agricultural wastewater be utilized without creating environmentally undesirable impacts?

3. Would use of recycled water or agricultural wastewater be economically feasible?

The Lemoore Naval Air Station Wastewater Treatment Plant is approximately 1.5 miles from GWF Henrietta. This wastewater treatment plant produces primary treated wastewater that is treated to secondary standards in effluent ponds in sufficient quantities to supply GWF Henrietta. The water quality of Lemoore NAS's secondary treated wastewater was relatively poor as compared to the standards laid out in SWRCB policies 75-58. Average total dissolved solids ranged from 1,370 to 2,480 mg/l, which is above the SWRCB's definition for fresh waters (TDS below 1,000 mg/l). While this wastewater is relatively poor quality, it is technically feasible to treat this water for use at GWF Henrietta. Therefore, Staff concluded that recycled water was available.

Utilizing the Lemoore NAS's secondary treated water would require a 1.5-mile pipeline, which could be constructed without creating environmentally undesirable impacts. The Lemoore NAS's secondary treated effluent currently is discharged to percolation/ evaporation ponds about 0.5 miles from the project site. The evaporation ponds cover approximately 275 acres, and removal of 158 afy of effluent would not significantly alter ponding or groundwater recharge in the vicinity of the ponds. Staff concluded that the Lemoore NAS's secondary treated effluent could be utilized without creating environmentally undesirable impacts.

Therefore, Staff asked the applicant to develop planning level costs for the use of secondary treated effluent. In Data Response 24, the applicant indicated that use of secondary treated effluent would require a capitol investment $1.19 million and an offsite annual disposal cost of $18,000 (GWF, 2009a). The capital costs included installation of a pump station and pipeline, tertiary treatment system, additional treatment systems, and wastewater treatment. Based on the scale of these increased costs, Staff concluded that use of recycled water was economically feasible.

Following this Data Response, Staff and the applicant met to discuss the feasibility of using recycled water for the project. Staff requested that the applicant examine the potential for this in greater detail and develop an equivalent annual cost comparison between the proposed water supply and use of recycled water. The applicant's revised cost estimate for utilizing recycled water included $13.5 million in capital costs and $2.75 million in annual costs (GWF, 2009b). In the more detailed cost estimate, capital costs increased significantly for the tertiary treatment system ($3.25M vs. $580K) and the wastewater treatment/zero liquid discharge system ($9.28M vs. $150K). The capital costs were based on estimates provided by Siemens and the applicant consulted the Turlock Irrigation District for costs associated with operations and maintenance of recycled water treatment and ZLD systems (GWF, 2009b).

To develop the equivalent annual costs estimate, the applicant spread the capital costs over 9 years, and added in the operation and maintenance costs. On a per MWH comparison, the applicant estimated that use of recycled water would cost about $13.32 per MWH vs. about $2.60 per MWH for the proposed surface water supply assuming 3,500 hours of annual operation and full allocation of surface water (GWF, 2009b). After the initial capital costs are recovered over the 9 year finance period, costs for using recycled water would decrease to $8.32 per MWH. Based on the analysis provided by the applicant, it does not appear that utilizing recycled water is economically feasible at this time.

Staff also considered the increased efficiency offered by the proposed GWF Henrietta amendment. The proposed project would increase electrical generation by about 26 percent with no additional natural gas usage and about 5 percent more water usage over the currently licensed project (assuming maximum operations).

GWF Henrietta proposes to use fresh water for evaporative cooling of intake air and a WSAC for lubricant oil cooling. GWF Henrietta is also planning to use an alternative cooling technology to reduce the amount of water required for plant operation: an air-cooled condenser system (ACC). The ACC has a significantly higher capital cost but would conserve water compared to typical wet cooling technologies, allowing the plant to use 80 – 90 percent less water. Staff concurs with GWF Henrietta that the use of an ACC is an economically sound practice that provides environmental benefits from significantly reduced water use compared to a traditional wet cooling tower plant.

The proposed maximum annual water use of 158 afy is relatively modest for a gas-fired power plant due to the incorporation of dry cooling technology. Given these increases in efficiency, the use of dry cooling technology, and the high costs associated with utilizing recycled water, Staff concludes that the proposed project would meet the requirements of the SWRCB and Energy Commission Policies, and the California Water Code.

OTHER LORS COMPLIANCE

Staff has reviewed the project elements and concludes that the proposed GWF Henrietta would comply with all applicable LORS addressing protection of water resources, stormwater management, erosion control, and the drinking water and wastewater discharge requirements, assuming that staff's proposed conditions of certification are adopted and implemented.

The project would comply with:

- The Clean Water Act and the authority granted to the State to enforce coverage under the NPDES by the Central Valley Regional Water Quality Control Board and the Kings County to administer the requirements and preparation of the SWPPPs and Drainage, Erosion and Sediment Control Plan;
- The Resource Conservation Recovery Act of 1976 by the proper handling and disposal of wastewater;
- The California Constitution, Article X, Section 2 by utilizing dry cooling to limit the use of groundwater for all plant operation uses;
- The Porter-Cologne Water Quality Control Act by the implementation of the DESCP and SWPPP and adherence to Industrial Waste Discharge Permit conditions;
- 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 issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable including permitting under the General NPDES Permits for Discharge of Stormwater associated with both construction and operation; and

- The SWRCB Resolution 75-58 by using dry cooling technology to limit the use of groundwater for all non-potable plant operational uses.

CONCLUSIONS AND RECOMMENDATIONS

Staff has not identified any unmitigable potentially significant impacts to Soil and Water Resources for the GWF Henrietta project and believes the project would comply with all applicable LORS provided the proposed conditions of certification are implemented.

Staff concludes the following:

- Implementation of Best Management Practices during GWF Henrietta construction in accordance with effective Storm Water Pollution Prevention Plans and a Drainage Erosion and Sediment Control Plan would avoid significant adverse effects that could otherwise result in significant transport of sediments or contaminants from the site by wind or water erosion.
- Significant impacts due to the proposed use of surface water for the project's process water supply would be mitigated through implementation of a (Water Use Compliance Plan that meets the requirements of the Tulare Lake Basin Water Storage District.
- The proposed use of dry cooling technology including an Air Cooled Condenser would significantly decrease surface water use by the project compared to a conventional plant using wet cooling towers.
- The project would not be located within the 100-year flood plain, and would not increase flood conditions downstream of the project.
- The disposal of industrial process wastewater at a licensed waste water disposal facility would meet RCRA and RWQCB 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 in the conditions of certification below.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff has proposed changes to Conditions of Certification Soil & Water 1, 2, 4, 5, 6, 7 and 8, and has proposed a new condition, Soil & Water 9. Condition of Certification Soil & Water 3 remains in effect and unchanged from the existing license for the HPP. Changes are shown below, with new text underlined and deleted text struck through."

~~**SOIL & WATER 1** Prior to beginning any site mobilization activities, the project owner shall obtain staff approval for an Erosion Control Plan that addresses all project elements. The plan submitted for staff's approval shall also contain provisions as needed, for containing and treating any contaminated soil or groundwater, and include any changes made to address the final design of the project. The plan shall apply to both the construction period and the post-construction (operation) period. It shall include final construction drainage~~

~~design and all applicable BMP's for on and off-site HPP project facilities, including final site drainage plans and locations of BMP's.~~

~~**Verification:** The Erosion Control Plan shall be submitted to the Compliance Project Manager (CPM) at least 60 days prior to start of any site mobilization activities. Approval of the final plan by the CPM must be received prior to the initiation of any site mobilization activities.~~

SOIL & WATER-1 Prior to site mobilization, the project owner shall obtain CPM approval for a site-specific DESCP that ensures protection of water quality and soil resources on the project site and along all linear facilities for both the construction and operation 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 offsite flooding potential, meet local requirements, and identify all monitoring and maintenance activities. The plan should include a vault based BMP targeting hydrocarbons and metals for the GWF Henrietta stormdrains prior to discharge into the retention basin. Monitoring activities shall include routine measurement of the volume of accumulated sediment in the stormwater retention basin. Maintenance activities must include removal of accumulated sediment from the retention basin when an average depth of 0.5 feet of sediment has accumulated in the retention basin. The plan shall be consistent with the grading and drainage plan as required by Condition of Certification CIVIL-1. The DESCP shall contain the following elements. All maps shall be presented at a legible scale.

Vicinity Map – A map shall be provided showing the location of all project elements with depictions of all significant geographic features to include watercourses, washes, irrigation and drainage canals, and sensitive areas.

Site Delineation – The site and all 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.

Watercourses and Critical Areas – The DESCP shall show the location of all nearby watercourses including washes, irrigation and drainage canals, and drainage ditches, and shall indicate the proximity of those features to the construction site.

Drainage – The DESCP shall include hydrologic calculations for onsite areas and offsite areas that drain to the site; include maps showing the drainage area boundaries and sizes in acres, topography and typical overland flow directions, and all existing, interim, and proposed drainage infrastructure and their intended direction of flow. The DESCP shall provide hydraulic calculations to support the selection and sizing of the drainage network, retention facilities and best management practices (BMPs). Spot elevations shall be required where relatively flat conditions exist. The spot elevations and contours shall be extended off site for a minimum distance of 100 feet in flat terrain or to the limits of the offsite drainage basins.

Clearing and Grading – The plan 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, cut/fill depths or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography tying in proposed contours with existing topography shall be illustrated. The DESCP shall include a statement of the quantities of material excavated at the site, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported or a statement explaining that there would be no clearing and/or grading conducted for each element of the project. Areas of no disturbance shall be properly identified and delineated on the plan maps.

Project Schedule – The DESCP shall identify on the topographic site map 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). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.

Best Management Practices – The DESCP shall show the location, timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during project element excavation and construction, during final grading/stabilization, and after construction. BMPs shall include measures designed to control dust and stabilize construction access roads and entrances. The maintenance schedule shall include post-construction maintenance of treatment-control BMPs applied to disturbed areas following construction.

Erosion Control Drawings – The erosion-control drawings and narrative shall be designed, stamped and sealed by a professional engineer or erosion-control specialist.

Verification: No later than 90 days prior to start of site mobilization, the project owner shall submit a copy of the DESCP to Kings County and the CPM for review and comment. A copy shall be submitted to the CPM no later than 60 days prior to the start of site mobilization for review and approval. The CPM shall consider comments received from Kings County. 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 stormwater BMP monitoring and maintenance activities.

SOIL & WATER-2 The project owner shall obtain a General NPDES permit for discharge of stormwater associated with construction activity from the CVRWQCB, and obtain CPM approval of the related Stormwater Pollution Prevention Plan (SWPPP) for construction activity. The SWPPP shall include final construction drainage design, and specify BMP's for all on and off-site GWF Henrietta ~~HPP~~ project facilities and shall comply with and incorporate Kings County Public Works Agency regulations, including those regulations and guidelines pertinent to areas with shallow groundwater. This includes

final site drainage plans and locations of BMPs. The project owner shall submit site drainage plans detailing collection of storm water from roadways, parking areas and all other areas subject to vehicular use. The project owner shall treat collected storm water from these areas to remove contaminants prior to use or discharge. Storm water from these areas must be treated for petroleum by-products and both suspended and dissolved solids. ~~The project owner shall provide a SWPPP for operation of the GWF Henrietta HPP and a copy of the operational NPDES permit issued by the CVRWQCB or a letter stating the operational NPDES permit is not required.~~

Verification: At least 60 days prior to the start of any site mobilization activities, the SWPPP for Construction Activity shall be submitted to the CPM for approval. Prior to the start of site mobilization, the project owner shall receive and provide proof to the CPM of having received an NPDES permit for construction activities. The SWPPP must comply with and incorporate Kings County Public Works Agency Grading Permit requirements. A letter from the Kings County Building Department addressing compliance with their grading permit requirements must be submitted with the SWPPP. A narrative and construction drawings detailing collection and process stream for storm water from contact areas of the site which are subject to vehicular use shall be submitted to the CPM. Approval of the final SWPPP by the CPM must be received prior to initiation of any site mobilization activities. ~~At least 60 days prior to the start of operations, the SWPPP for operations shall be submitted for CPM approval. The project owner shall provide a copy of the operational NPDES permit or a letter stating a NPDES permit is not required. Approval of the operational SWPPP by the CPM must occur prior to initiation of operations.~~

SOIL & WATER-4 Due to the shallow groundwater underlying the site, the project owner shall submit construction drawings demonstrating compliance with current county regulations for the on-site sewage disposal system, including a vertical cross-section showing proximity to groundwater as delineated in the geotechnical report performed by Kleinfelder, Inc., and dated November 1, 2001. The project owner shall verify the required septic tank and leach field capacity based on any anticipated increases in operational staff related to GWF Henrietta. A letter from the Kings County Building Department addressing compliance, with county requirements must be submitted with the drawings.

Verification: No later than 30 days prior to site mobilization, the project owner shall provide evidence of compliance with Kings County Sewage Disposal Regulations to the CPM for approval.

SOIL & WATER-5 The project owner shall not discharge any waste water off-site, except as delivered to licensed waste disposal contractors as described in Section 2.2.9.1 of the HPP Application for Certification. The project owner shall supply the CPM with copies of the contract between the project owner and the waste disposal contractor, as well as copies of the contractor's permits and certifications relative to the hauling and disposal of the process wastes and contact storm water wastes. Notification of any changes in waste disposal contractor or subcontractors shall be made to the CPM within 30 days of the change.

Verification: The project owner shall maintain records of wastewater hauled off-site, including hauler's Chain of Custody or other signed and dated receipts. Copies of these records shall be submitted to the CPM as part of the project owner's annual compliance report. Before operation of the power plant, the CPM will be supplied with copies of the waste disposal contract and the contractor's certifications and permits. The CPM shall be notified of any change in the contract, contractors or sub-contractors within 30 days of the change.

SOIL & WATER-6 The project owner shall implement a biannual stormwater monitoring program to assess the quality of storm water discharges to the evaporation/percolation basin during two storm events as required by the Central Valley Regional Water Quality Control Board. The monitoring program shall include sampling methodology and analytes. Analytes shall include pH, total organic compounds, total petroleum hydrocarbons, oil & grease, metals, total suspended solids and specific conductance. The CPM may require additional analytes if additional concerns arise.

Verification: The project owner shall submit a storm water monitoring program to the CPM for approval no later than 60 days prior to initiation of site mobilization activities. The project owner shall submit results of the monitoring program, including laboratory reports, to the CPM as part of the annual compliance report.

SOIL & WATER-7 Prior to site mobilization, the project owner shall obtain CPM approval for a project-specific Water Use Compliance Plan (WUCP) that identifies all lands with surface water entitlements that may be used to transfer water supply to GWF Henrietta. The WUCP shall limit increases in groundwater pumping associated with transfers of surface water entitlements and identify fallow land management practices. The WUCP shall require monitoring of water use at the GWF Henrietta Site and at all lands with surface water entitlements to be utilized at GWF Henrietta. Water used for the HPP shall be CVP water allocated to the 9.86 ~~7~~ acres of the GWF Henrietta ~~HPP~~ parcel converted to Manufacturing and Industrial Use and SWP entitlement water as described in the County of Kings will-serve letter dated August 23, 2001 and the memorandum from Michael Nordstrom dated September 20, 2001. Total water use at GWF Henrietta shall be limited to a maximum of 160 acre-feet per year. Any additional lands with purchase options intended to provide surface water entitlements must be identified and details of the purchase options provided to the CPM for review and approval. The WUCP shall include the following elements:

Water Transfer Lands – All lands for which the project owner may transfer surface water entitlements to provide water supply for GWF Henrietta shall be clearly identified on a map and by parcel number.

Water Use History – The history of groundwater pumping and surface water use for the previous five years (minimum) shall be provided for each parcel of land for which surface water entitlements may be transferred to provide water supply for GWF Henrietta. Groundwater pumping may not increase above historic levels on any parcel of land that transfers surface water entitlements to GWF Henrietta.

Fallowed Land Management Practices – Customary and accepted practices shall be identified and utilized to maintain the agricultural productivity of the fallowed lands and to protect neighboring land owners from erosion related impacts associated with fallow of lands.

The project owner shall submit a water use summary annually. The water use summary shall state the source and quantity of the water used at GWF Henrietta ~~HPP~~ on a monthly basis, whether the water used was obtained from the current year allocation or the banked surplus allocations from previous years. The water use summary shall include the percentage of the entitlements delivered for the current year from the SWP and CVP, as well as, the amount of the current year's water banked for future use and cumulative total banked water available for future use. The annual water use summary shall include records of annual surface water and groundwater use at each parcel identified in the approved WUCP that may transfer surface water entitlements to GWF Henrietta.

Verification: No later than 90 days prior to the start of site mobilization, the project owner shall submit a copy of the WUCP to the Tulare Lake Basin Water Storage District and the CPM for review and comment. A copy shall be provided to the CPM no later 60 days prior to the start of site mobilization for review and approval. The CPM shall consider comments received from the Tulare Lake Basin Water Storage District. During operation. The project owner shall submit as part of its annual compliance report a Water Use Summary to the CPM on an annual basis for the life of the project. The project owner must submit a revised WCOP that identifies any new parcels that may provide surface water entitlements for GWF Henrietta prior to use of water from a new parcel.

SOIL & WATER-8 To provide background perched groundwater quality information, GWF shall submit a plan for approval that identifies how the project owner will install and sample perched water from a groundwater monitoring well.

Verification: The project owner shall submit groundwater data including depth to groundwater information prior to the submission of the SWPPP to the CPM for approval. The monitoring program shall include sampling methodology and analytes. The project owner shall submit results of the monitoring program, including laboratory reports, to the CPM. The groundwater monitoring well shall be screened at a depth of 6–9 feet located on the HPP parcel (in the NW corner of the property if the current ground conditions allow access). The well annulus shall be sealed with a mixture of benonite clay and cement. The well shall be equipped with a locking cover and protected with a concrete-filled pipe bollard set in concrete. Analytes shall include pH, total organic compounds, total suspended solids, and specific conductance. Additional wells and monitoring may be required based on the initial well test results, if the results indicate the perched water is of high quality and has beneficial uses. If the CPM determines additional monitoring and/or wells are required based upon the initial results, the project owner shall submit for CPM approval a groundwater monitoring plan. If a groundwater monitoring plan is required, approval of the final plan by the CPM must be received prior to initiation of any site mobilization activities.

SOIL & WATER-9 During project operation, the project will not discharge any stormwater offsite. All stormwater shall be collected and directed to the onsite retention basin. The project owner shall submit a Notice of Non-Applicability (NONA) to the RWQCB to apply for an exemption to general NPDES permit. If conditions at the site change and the project will discharge stormwater from the site, the project owner shall 1) comply with the requirements of the general NPDES permit for discharges of storm water associated with industrial activity, 2) develop and implement a Storm Water Pollution Prevention Plan (SWPPP) for the operation of the site, and 3) discharge solely stormwater from the site.

Verification: Prior to commencing operations, the project owner shall submit a letter from the RWQCB indicating that there is no requirement for a general NPDES permit for discharges of stormwater associated with industrial activity to the CPM. At least 30 days prior to the discharge of stormwater during commercial operation, the project owner shall submit copies to the CPM of the operational storm water pollution prevention plan for the GWF Henrietta site. Within 10 days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the project owner and the RWQCB about the general NPDES permit for discharge of storm water associated with industrial activity. This information shall include a copy of the notice of intent sent by the project owner to the State Water Resources Control Board and the notice of termination.

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TRAFFIC AND TRANSPORTATION
Testimony of Scott Debauche

INTRODUCTION

With respect to traffic and transportation, the petition to amend the Henrietta Peaker Plant (HPP) license includes four substantive changes to plant operations: 1) adding two Once-Through Steam Generators (OTSGs); 2) adding a 25-MW steam turbine; 3) installation of an air-cooled condenser (ACC) to allow use of dry cooling at the converted plant; and 4) installation of a wet-surface air cooler (WSAC) for lube-oil cooling. These modifications to the existing plant would increase net generation from the facility to 120 MW without increasing fuel use. These proposed modifications would require changes to the site layout, including transporting new components and equipment to the site. In addition, GWF requests to add a temporary area adjacent the project site for construction worker parking and secondary laydown.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

In general, the applicable federal, state and local LORS have not changed since the project was analyzed in the original proceeding in 2001. The Kings County General Plan was amended on January 27, 2004, after completion of the original Henrietta Staff Assessment. However, after review by staff, the amendment did not alter the General Plan Transportation Element (Kings County 2004). Therefore, the General Plan Circulation Element LORS have not changed compared to those analyzed in the original Staff Assessment.

However, the Kings County Association of Governments (KCAG) revised the Regional Transportation Plan (RTP) in 2007, the Regional Transportation Implementation Plan (TIP) in 2008, the Regional Bicycle Plan in 2005, and the Regional Transit Plan in 2003 (KCAG 2009). **TRAFFIC AND TRANSPORTATION Table 1** provides a general description of adopted local LORS pertaining to traffic and transportation relevant to the proposed GWF Henrietta project that have been updated since the original 2001 project analysis.

TRAFFIC AND TRANSPORTATION Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Local	
Kings County 2007 Regional Transportation Plan (RTP) and 2008 Regional Transportation Improvement Plan (TIP)	2007 RTP Chapter 3 (Policy Element) identifies 17 policies and 110 objectives needed to carry out the goals and to respond to the issues of the RTP concerning various modes of transportation, including intermodal and multimodal transportation activities. Funding to implement the transportation activities proposed in the RTP is programmed through the Kings County TIP.
Kings County 2005 Regional Bicycle Plan	The Kings County Regional Bicycle Plan, administered by Kings County Association of Governments (KCAG), describes existing bicycle facilities and details proposed locations for new bicycle routes and amenities in the county. The plan advocates bicycling as an alternative to vehicular transportation to achieve potential improvements in traffic congestion and air quality.
Kings County 2003 Regional Transit Plan	The Kings County Transit Development Plan, administered by KCAG, analyzes future transit needs and itemizes the necessary future service requirements needed to make public transit more efficient and accessible.

ANALYSIS

Staff has reviewed the petition for potential environmental effects and consistency with applicable LORS, as provided above in **TRAFFIC AND TRANSPORTATION Table 1**. Based on this review, staff determined that the proposed amendment would not be a significant change from the original project in terms of traffic and transportation impacts. Therefore, staff is not recommending any modifications to existing traffic and transportation conditions of certification.

Staff has reviewed the project changes and has evaluated the following impacts on the local traffic and transportation system based on the four changes to the original project, as stated earlier.

ROADWAY AND INTERSECTION LEVELS OF SERVICE – CONSTRUCTION

The construction of GWF Henrietta will occur over an estimated 15-month period between 2011 and 2012, and generate 142 daily round trips from construction workers during the peak construction period, and approximately 33 truck trips per day during the peak construction material delivery month (GWF 2008, pp. 3-89 and 3-91). This number represents a decrease in worst-case daily construction worker trips and an increase in the worst-case daily truck delivery trips as compared to the original project. The slight increase in peak construction truck delivery traffic would be offset by a decrease in construction worker trips, and is therefore not considered a significant change when

compared with the original project. Pursuant to existing Condition of Certification **TRANS-7**, prior to the start of construction the project owner will consult with Kings County and the California Department of Transportation (Caltrans) to prepare and submit a construction traffic control plan and implementation program to minimize any potential construction traffic related impacts to local roadways and highways. Furthermore, consistent with Condition of Certification **TRANS-5,** the project owner would be required to designate travel routes for construction workers and truck deliveries in consultation with Kings County and Caltrans. Staff notes that current and expected 2010 traffic flows on local highways and roadways are similar to conditions noted in the original analysis performed in 2001, and are within the Kings County acceptable levels of service (C or better) [GWF 2008, Table 3.11-5].

ROADWAY AND INTERSECTION LEVELS OF SERVICE – OPERATION

Changes to the operation of GWF Henrietta will generate 14 additional employees beyond those described for the original project, while monthly deliveries will remain the same (GWF 2008, p. 3-91). Therefore, no significant change in operational traffic volumes will result from project operation.

AVIATION

GWF Henrietta is located approximately 4.5 miles from the southern edge of the nearest runway at Lemoore Naval Air Station (NAS). As the Lemoore NAS is a United States Navy owned airfield, the number of operations per day is unavailable to the public (AirNav 2009). Lemoore NAS contains an air traffic control tower and observes both Visual Flight Rules (VFR) and instrument approaches (AirNav 2009). Lemoore NAS contains two 13,500-foot offset parallel runways approximately 4,600 feet apart (AirNav 2009). Both runways are oriented northwest/southeast and designated as 14L/32R under northwest arrivals and departures and 14R/32L under southeast arrivals and departures (AirNav 2009). Both Lemoore NAS runways observe a recommended left turn traffic pattern (AirNav 2009). Due to the direct southern location of the proposed GWF Henrietta site, under 14R/32L departures, air traffic departures observing a left turn traffic pattern (east) direct aircraft away from the GWF Henrietta site. Therefore, due to the distance of the GWF Henrietta site (approximately 4.5 miles from the southern edge of the nearest runway), the type of aircraft typically using Lemoore NAS (Navy fighter jets that gain altitude quickly after takeoff), and the recommended left turn traffic pattern directing aircraft away from the GWF Henrietta site, staff concludes that thermal plumes generated by proposed new GWF Henrietta components would not impact aircraft operations at Lemoore NAS. Furthermore, the project owner will coordinate with Lemoore NAS regarding proposed stack lighting for GWF Henrietta (GWF 2008, p. 3-92).

All land within 1 mile of the project site is zoned Exclusive Agriculture (AX) by Kings County (GWF 2008, p. 3-53). Therefore, agricultural production in the vicinity of the GWF Henrietta site may use aeronautic crop dusting aircraft that fly at a low altitude near and over the project site. Proposed GWF Henrietta OTSGs, ACCs, and WSAC exhaust could result in an increase over existing plumes generated by the plant, or generate new thermal air plume velocities that could result in turbulence with the potential to affect low-flying crop duster aircraft maneuverability above the GWF

Henrietta site. Therefore, potential impacts of the GWF Henrietta thermal exhaust plumes to low flying aircraft could occur and are analyzed below.

A plume velocity analysis was conducted for GWF Henrietta assuming worst-case meteorological conditions (cool temperatures and calm winds) and comparing existing plumes to both simple-cycle and combined-cycle operating conditions. The worst-case airspace conditions (cool temperatures and calm winds) used in the velocity calculations are a frequent natural occurrence and would presumably occur frequently during the life of the power plant and potentially when small aircraft fly above GWF Henrietta site. For purposes of this analysis, a vertical velocity of 4.3 meters per second (m/s) plume average velocity has been determined as the critical velocity of concern to light aircraft. **TRAFFIC AND TRANSPORTATION Table 2** shows the existing and proposed simple- and combined-cycle operational average plume velocity speed in meters per second (m/s) above ground level (AGL).

TRAFFIC AND TRANSPORTATION Table 2
GWF Henrietta Existing and Proposed Simple-Cycle Operational Plume Average Velocity

Height (ft)	Existing Plume Velocity (m/s)	Proposed Simple-Cycle Plume Velocity (m/s) [a]	Proposed Combined-Cycle Plume Velocity (m/s)
300	8.28	8.28	4.47
400	6.90	6.90	3.72
500	6.15	6.15	3.32
600	5.66	5.66	3.05
700	5.30	5.30	2.86
800	5.02	5.02	2.70
900	4.79	4.79	2.58
1,000	4.60	4.60	2.48
1,100	4.43	4.43	2.39
1,200	4.29	4.29	2.31
1,300	4.17	4.17	2.25
1,400	4.05	4.05	2.19
1,500	3.95	3.95	2.13
1,600	3.86	3.86	2.08
1,700	3.78	3.78	2.04
1,800	3.70	3.70	2.00
1,900	3.63	3.63	1.96
2,000	3.57	3.57	1.92

[a] Assumes full mixing of the two stacks in calm wind conditions.
Source: Aspen 2009.

As shown in **TRAFFIC AND TRANSPORTATION Table2**, the proposed simple-cycle plume velocity remains identical to existing conditions, above 4.3 m/s up to 1,190 feet above ground level (AGL). However, for the proposed combined-cycle operations, plume velocity will be above 4.3 m/s up to approximately 320 feet AGL. Therefore, in comparison to both existing and proposed simple-cycle operation, this type of operation would be of significantly reduced aviation concern from the current operations.

Because the height at which the plume velocity drops below 4.3 m/s remains unchanged when existing plumes are compared to proposed simple-cycle operations, and reduced when comparing existing plumes to proposed combined-cycle operations, staff determines that the proposed GWF Henrietta project will not result in potentially

adverse impacts to low-flying aircraft using the airspace above the GWF Henrietta site over existing conditions. It should be noted that under current operations, plume velocities from existing operations could cause moderate to severe turbulence to low-flying aircraft over the existing plant at distances of 1,190 feet AGL and below. However, operation of the proposed GWF Henrietta project under either simple- or combined-cycle operations would either result in identical or reduced risk to low-flying aircraft. No new or increased aviation impacts would occur as a result of the proposed GWF Henrietta project.

HAZARDS AND PUBLIC SAFETY

Construction vehicle impacts to vehicle hazards and public safety would be minimized by Condition of Certification **TRANS-7**, which would continue to require the preparation of a construction traffic control plan that includes measures to minimize vehicle hazards to the maximum extent feasible, including signing, lighting, flaggers, or traffic control device placement to direct traffic and ensure access.

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. Condition of Certification **TRANS-1** would continue to require that all oversize vehicles used on public roadways during construction comply with Caltrans and Kings County limitations on vehicle sizes and weights, as well as oversize vehicle routes and any other applicable limitations or other relevant jurisdictional policies. Furthermore, Condition of Certification **TRANS-4** would continue to require the project owner or construction contractor to comply with Kings County and Caltrans limitations for encroachment into public rights-of-way (ROW) and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions. These conditions would continue to ensure that no safety impacts would occur from oversize construction vehicle trips and/or construction vehicle encroachment on public ROW.

To maintain temporary access for emergency vehicles and allow for adequate access into the facility, Condition of Certification **TRANS-7** would continue to require the preparation of a construction traffic control plan, which includes the assurance of access and movement of emergency vehicles. The proposed GWF Henrietta modifications would require changes to the site layout. However, staff review indicates that adequate room for emergency vehicles to turn around within the facility boundaries would remain similar to that currently at the existing power facility.

There is also a potential for unexpected damage to roads by vehicles and equipment within the project area that could result in a roadway hazard to the public. Condition of Certification **TRANS-5** would continue to 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.

As stated earlier, monthly delivery trips to the GWF Henrietta plant will remain the same (GWF 2008, p. 3-91). However, any increase in truck trips delivering and removing hazardous materials or wastes during project construction would be subject to Condition of Certification **TRANS-3,** which would continue to ensure that all federal and state regulations for the transportation of hazardous materials are observed during both construction and operation of the facility and that all permits and/or licenses are secured

from the California Highway Patrol and Caltrans for the transportation of hazardous material.

PARKING AND SITE ACCESS

GWF Henrietta would include a temporary area adjacent to the project site for construction worker parking. Therefore, original Condition of Certification **TRANS-2** would not be required to ensure that on-site construction parking would occur. Access during both construction and operation of GWF Henrietta will be from 25th Avenue. This would not result in a change from existing conditions and that presented in the original Staff Assessment. Therefore, no change to site access would occur.

ALTERNATIVE TRANSPORTATION

Existing Condition of Certification **TRANS-7** would continue to require the preparation of a construction traffic control plan that includes maintaining access to adjacent property. Therefore, no existing bicycle path or local pedestrian facilities would be adversely affected during construction of the GWF Henrietta project.

CUMULATIVE IMPACTS

The 2007 Kings County RTP identifies the following long-range and short-range improvements to the regional transportation system (GWF 2008, pp. 3-85 and 3-86):

- SR 198 between SR 43 and Tulare County – Widening of the highway from two-lanes to a four-lane expressway, estimated to be completed in 2010.
- SR 198 at 19th Avenue – Construction of an interchange, estimated to be completed after 2020.
- SR 198 at 9th Avenue – Construction of an interchange, estimated to be completed after 2030.
- SR 198 at 12th Avenue – Construction of an interchange, estimated to be completed by 2013.
- SR 198 from 19th Avenue to 11th Avenue – Pavement overlay (rehabilitation) to be completed by 2009-2010.

  SR 41 from SR 198 to I-5 – Widening from 2 to 4 lanes, estimated to be completed after 2030.
- SR 41 at Grangeville Boulevard – Construction of an interchange, estimated to be completed after 2030.
- I-5 – Widening from 4 to 6 lanes, estimated to be completed after 2030.

The proposed construction schedules for these projects are not expected to overlap with the construction of the proposed GWF Henrietta project (GWF 2008, p. 3-86). Furthermore, existing Condition of Certification **TRANS-8** would continue to require the applicant to confer with area jurisdictions (i.e., Lemoore NAS, Kings County, Fresno County and the city of Lemoore) to determine that construction schedule and equipment transportation routes do not interfere with existing or planned projects. This would ensure less than significant GWF Henrietta cumulative transportation and traffic impacts.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) COMPLIANCE

Staff has reviewed the 2007 RTP and 2008 Regional TIP policies and objectives for potential environmental effects (KGAG 2009). As discussed earlier, compliance with existing Conditions of Certification **TRANS-5** and **TRANS-7** would ensure that project-related construction traffic associated with the proposed GWF Henrietta project would not adversely impact any roadways applicable to policies or objectives of the RTP and TIP. No operational traffic impacts would occur, thus ensuring project compliance with the Kings County RTP and TIP.

GWF Henrietta will occupy an approximate 9.86-acre, fenced site within the existing GWF-owned 20-acre parcel. A review of the Kings County 2005 Regional Bicycle Plan indicates that no planned or existing bicycle paths occur within the project site (KCAG 2009). Furthermore, a review of the Kings County 2003 Regional Transit Plan indicates that the site is not included in any future or existing transit plans (KGAG 2009). Existing Condition of Certification **TRANS-7** would continue to require the preparation of a construction traffic control plan that includes maintaining access to adjacent property. Therefore, no existing bicycle path or local public transit facilities would be impacted during construction of the GWF Henrietta project.

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that the changes associated with the GWF Henrietta project related to traffic and transportation would result in less than significant impacts when original Conditions of Certification **TRANS-1** and **TRANS-3** through **TRANS-8** are incorporated. The project would comply with all applicable Transportation and Traffic LORS.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff has proposed no modifications to original Transportation and Traffic Conditions of Certification **TRANS-1** and **TRANS-3** through **TRANS-8.** However, because the GWF Henrietta project would include a temporary area adjacent to the project site for construction worker parking, original Condition of Certification **TRANS-2** would not be required to ensure that on-site construction parking would occur. The change staff has proposed to the Transportation and Traffic conditions of certification is shown below.

~~**TRANS-2** During construction of the power plant and all related facilities, the project owner shall arrange for on-site construction-period parking.~~

~~**Verification:** At least 60 days prior or prior to any ground disturbance activity, the project owner shall submit a parking and staging plan for all phases of project construction to Kings County for review and comment and to the CPM for review and approval.~~

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TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

INTRODUCTION

This analysis addresses whether the transmission line safety and nuisance aspects of the Henrietta Peaker Project (HPP) would be changed by the proposed amendment converting the peaking units to combined cycle units, thereby necessitating specific changes to the conditions of certification specified in the related Energy Commission Decision of March 2002.

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

There are no new or changed transmission line and safety-related laws, ordinances, regulations, and standards (LORS) that would be applicable to the project as proposed to be amended.

ANALYSIS

This analysis is based, in part, on information provided in the HPP Application for Certification (GWF Energy, LLC 2001), GWF Henrietta Peaker Project amendment (GWF Energy, LLC 2008), and the Staff Assessment for the Henrietta Peaker Project (CEC 2001). The purpose of staff's analysis was to assess whether the proposed line construction and operational plan adequately incorporated the measures necessary for compliance with health and safety laws, ordinances, regulations, and standards (LORS) of concern for the 70-kV lines of the type proposed for the project. The analysis focused on the following issues relating primarily to the physical presence of the line or secondarily to the physical interactions of the line's electric and magnetic fields:

- Aviation safety
- Interference with radio-frequency communication
- Audible noise
- Fire hazards
- Hazardous shocks
- Nuisance shocks, and
- Electric and magnetic field (EMF) exposure

Staff assessed the applicant's proposed mitigation measures and determined that their implementation would be adequate to ensure that the line impacts of concern would be below the levels of potential significance. Staff's proposed conditions of certification (which were specified in the March 2002 Energy Commission Decision (CEC 2002)) were intended to ensure implementation. The proposed amendment to add one new power generator would increase generating capacity without affecting the line design

and operational plan necessary to ensure that the line impacts of concern would remain at less than significant levels.

CONCLUSIONS AND RECOMMENDATIONS

Since the proposed amendment would increase generating capacity without affecting the line design and operational plan bearing on the field and non-field impacts addressed in the initial staff assessment, staff does not consider it necessary to recommend modifications to the five conditions of certification specified in the Energy Commission Decision of March 2002.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

None.

REFERENCES

California Energy Commission (CEC). 2001. Staff Assessment for the Henrietta Peaker Power Plant, published on December 18, 2001.

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VISUAL RESOURCES
Testimony of Marie McLean

INTRODUCTION

GWF wishes to convert the Henrietta Peaker Plant (HPP) to a combined-cycle power plant with a nominal 25 MW (net) of additional generating capacity, resulting in a nominal generating capacity of 120 MW net. Once converted, the new facility will be known as GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta). See **VISUAL RESOURCES Figure 1,** Location Map, for the location of GWF Henrietta.

Visual elements to be considered in the conversion include the demolition and removal of the two existing oxidation catalyst and selective catalytic reduction (SCR) systems, including the existing catalyst housing and 85-foot stacks; addition of two once-through steam generators (OTSGs) with rectangular stacks approximately 91.5 feet tall by 13 feet wide by 8.90 feet long; addition of a new 74 foot-tall by 240-foot wide air-cooled condenser (ACC); and addition of a generator step-up transformer and circuit breaker into the existing on-site 115 kV switchyard.

In addition, approximately 4.52 acres will be disturbed outside the existing fence line for construction laydown and parking.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) COMPLIANCE

See **VISUAL RESOURCES Table 1**, which follows, for information on LORS pertaining to this project.

VISUAL RESOURCES Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Transportation Equity Act for the 21st Century of 1998, and Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2005.	Designed to protect federally managed lands or a recognized National Scenic Byway or All-American Road within its vicinity. Does not apply to this project.
State	
California Streets and Highways Code, Sections 260 through 263 – Scenic Highways	Designed to ensure the protection of highway corridors that reflect the State's natural scenic beauty. No scenic highways are located near the GWF Henrietta location
Local	
Kings County General Plan, adopted December 28, 1993, and last amended February 10, 1998.	Kings County General Plan, Open Spaces, includes policies for designated scenic highways. No scenic highways are in the vicinity of GWF Henrietta.

ANALYSIS

Staff has reviewed the Petition for License Amendment for GWF Henrietta, dated September 2008, as well as the HPP Staff Assessment, dated December 18, 2001, and the Energy Commission's March 5, 2002, decision approving the project.

Staff concludes that the design changes proposed do not significantly alter the visual resources findings found in the Energy Commission's March 5, 2002, decision pertaining to the HPP.

Staff based its decision on a photographic analysis of four key observation points (KOPs) provided by the applicant in its October 2008 amendment petition as well as an analysis of visible water vapor plumes. Information about KOPs and visible vapor water plumes are included in this section.

In addition, staff has also determined that with the implementation of the Energy Commission's conditions of certification for visual resources, the construction and operation of the GWF Henrietta will not result in any significant adverse visual resource impacts.

Information about conditions of certification is also included in this section.

KEY OBSERVATION POINTS (KOPS)

The applicant submitted photographs and descriptions of four Key Observation Points (KOPs) for analysis. These KOPs provide a current view of the site as well as a simulated view with new facilities added. Those KOPs include the following:

1. KOP1, Looking south from 25th Avenue, approximately 0.67 miles from the site.
2. KOP2, Looking southwest toward project site, approximately 1 mile from the site.
3. KOP3, Looking northwest from project site, approximately 1.5 miles from project site.
4. KOP4, Looking northwest toward project site from intersection of Avenal Cutoff Road and 25th Avenue, approximately 3.5 miles from project site.

Those KOPs were used to (1) compare the most visibly prominent structures of the original HPP with those that will result from the conversion of the HPP to a combined-cycle plant; and (2) assess the visual impacts of those structures on the surrounding landscape. See **VISUAL RESOURCES Figure 2**, Key Observation Points, for a location map of the four KOPs.

For the HPP currently occupying the site, the most visible components consist of two 85-foot tall stacks, two 50-foot tall air pollution control system structures; and a 50-foot tall combustion turbine inlet air structure. Those components will be demolished and removed from the site.

The most visible components of the new GWF Henrietta would be the two OTSGs at 67 feet high, 55 feet long, and 13 feet wide; two 91.5-foot tall OTSG stacks; and the ACC at 74 feet high, 120 feet long, and 84 feet wide.

Staff has reviewed the four KOPs included in the *Petition for License Amendment* and notes the following:

1. In the December 28, 2001, visual resources analysis performed for the HPP, staff concluded that *visual sensitivity* for each KOP was *low*. The KOPs selected and analyzed for the Henrietta Peaker Project are the same KOPs included in this analysis. Hence, staff notes that the conversion of the Henrietta Peaker Project to a combined-cycle plant results in no change in the *visual sensitivity* of the KOPs included in this analysis.

2. The proposed prominent structural changes do not significantly alter the visual resources analysis included in the December 18, 2001, staff assessment. Staff's conclusions were based on the following visual analyses:

   a. KOP1 presents a view of the site from along 25th Avenue, looking north, approximately 0.67 miles from plant. This view would primarily be experienced by area motorists and residents traveling on this road. From this KOP, viewers see the most prominent structures introduced to the project site—the two 91.5 feet stacks and the air-cooled condenser (ACC).

      The height, length, and width of the ACC, plus its prominent placement on the site, make it the most visible component from this KOP. See **VISUAL RESOURCES Figure 3**, KOP1, Existing View, GWF Henrietta, Looking North From 25th Avenue; and **VISUAL RESOURCES Figure 4**, KOP1, Simulated View, GWF Henriettat, Looking North from 25th Avenue.

      From this KOP, visual sensitivity and visual contrast are moderately low. In terms of line and form, the new units, particularly the new ACC, stand out. However, the stacks blend into other horizontal elements, including the poles and transmission towers. The color of the new elements—required as a Condition of Certification approved by the Energy Commission on March 5, 2002—will help to ensure the blending of the new elements into the existing environment.

      The new elements do not dominate the view from this KOP. Instead, the most dominate feature in this KOP are the telephone poles and wires located on either side of the highway. Hence, dominance is low. Also, the new additions do not block or disrupt views. Hence, the rating for view blockage is low. Consequently, visual change resulting from the addition of the new units is low. And the introduction of the new units to this KOP results in a rating of *not significant*.

   b. KOP2 presents a 1 mile view looking southeast toward the project site from State Route (SR) 198, which runs in an east-west direction from this KOP. See **VISUAL RESOURCES Figure 5**, KOP2, Existing View, Henrietta Peaker Project, Looking Southeast from State Route 198; and **VISUAL RESOURCES Figure 6**, Simulated View, GWF Henrietta, Looking Southeast from State Route 198.

The view is dominated by agricultural lands in the foreground and midground and a muted view of the plant, transmission lines, and towers in the background.

At this KOP, the new additions to the project result in a moderately low level of contrast in this decidedly industrial setting populated by tall, vertical poles and transmission towers. The shape of the ACC introduces a large, tall, horizontal element into the viewshed. As a result, the ACC draws attention because of its line and form. However, the color of the proposed elements will help to ensure their blending with other structures in the view shed, thus decreasing its impact.

The new elements introduced to the site do not dominate the site. Instead, they are codominant with other structural elements in this KOP. In addition, the new elements do not block any views, so view blockage is low. As a result, visual change is moderately low. The introduction of the new units to the site results in a rating of *adverse but not significant* for this KOP.

c. KOP 3 represents a view of the project site from the westbound lane of State Route 198, looking approximately 1.5 miles southwest to project site. See **VISUAL RESOURCES Figure 7**, KOP3, Existing View, GWF Henrietta, Looking Southwest from State Route 198; and **VISUAL RESOURCES Figure 8**, Simulated View, GWF Henriettat, Looking Southwest from State Route 198.

   In this KOP, the foreground is dominated by agricultural land planted with field crops. GWF Henrietta is visible in the background along with the transmission towers and lines.

   At this KOP, the new additions to the site result in a low level of contrast with the existing project. The most noticeable addition is the vertical mass of the ACC. However, the distance of this KOP from the project site—1.5 miles—as well as the color of the additions, which helps blend them into the background, mutes the contrast.

   From this KOP, the new elements are subordinate with the elements already existing on the site. In addition, the new elements do not substantially block the view of the mountains in the distance, a view that is disrupted by the existing poles, transmission towers, and elements of the existing HPP and Pacific Gas & Electric (PG&E) substation. Hence, view blockage is low; and visual change is also low. Therefore, the introduction of the new units to the site results in a rating of *not significant* for this KOP.

d. KOP4 represents a view 1 mile from the project site looking northwest from Avenal Cutoff Road, approximately 3.5 miles northeast of the intersection of Avenal Cutoff Road and 25th Avenue. In this view, the foreground is dominated by agricultural land. Industrial structures, including the power plant and transmission towers, dominate the midground. The background is dominated by mountains. See **VISUAL RESOURCES Figure 9**, KOP 4, Existing View, GWF Henrietta, Looking Northwest From Avenal Cutoff Road, and **VISUAL**

RESOURCES Figure 10, Simulated View, GWF Henrietta, Looking Northwest from Avenal Cutoff Road.

From this KOP, visual contrast is moderate. The juxtaposition of the stacks and ACC create a mass that stands out from the other elements on the site. The plant is located about 1 mile from this KOP. Viewed from this distance and in context with the other on-site elements, the new elements are codominant with other elements on the site.

View blockage is moderately low and visual change, moderate. As a result, visual change is *adverse but less than significant*.

LIGHT AND GLARE

Additional visible lighting will occur as a result of the construction and operation of GWF Henrietta. Consequently, staff carries over the continuation of **Condition of Certification VIS-4**.

VISIBLE VAPOR WATER PLUMES

Whenever steam is used to generate electricity, water vapor plumes are formed. However, the visible water vapor plume analysis done for this project indicated a less than significant impact from visible water vapor plumes. See **APPENDIX VR-1** for the complete analysis.

CONDITIONS OF CERTIFICATION

Visual conditions of certification are designed to help minimize visual impacts from the project. In this analysis staff carries over the six conditions of certification included in the Energy Commission's March 5, 2002, decision. See *Henrietta Peaker Project Staff Assessment*, December 18, 2001.

In addition, staff proposes a new condition of certification, **VIS-7,** Construction Screening**.** See Proposed Conditions of Certification in this document.

CONCLUSIONS AND RECOMMENDATIONS

Staff has reviewed the Petition for License Amendment submitted by the applicant in September 2008 and concludes that the design changes proposed do not significantly alter the visual resources findings included in the Energy Commission's March 5, 2002, decision pertaining to the HPP.

Staff has determined that with the implementation of the six Energy Commission's conditions of certification for visual resources included in the December 2001, *Henrietta Peaker Plant Staff Assessment* adopted by the Energy Commission on March 5, 2002, as well as the new condition of certification, **VIS-7** included in this analysis, the construction and operation of the GWF Henrietta will not result in any significant adverse visual resource impacts.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff has proposed visual resources Condition of Certification **VIS-7** to screen the construction laydown and parking area to be located north of the current boundary of the HPP site.

Construction Screening

VIS-7 The project owner shall reduce the visibility of construction equipment, materials, and activities at the project site and as appropriate at any staging and material and equipment storage areas with temporary screening, such as fabric attached to fencing or berms, prior to the start of ground disturbance. Screening shall be of an appropriate height, design, opacity, and color for each specific location, as determined by the CPM.

The project owner shall submit to the CPM for review and approval a specific screening plan whose proper implementation will satisfy those requirements. The project owner shall notify the CPM when installation is completed.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the screening plan to the CPM for review and approval. The screening shall be installed during the site mobilization phase. The project owner shall notify the CPM when installation is completed.

The project owner shall provide the CPM with electronic color photographs after installing screening at the power plant site and at staging and material and equipment storage areas indicating the effectiveness of the screening.

REFERENCES

California Department of Transportation; http://www.dot.gov/hq/LanadArch/.

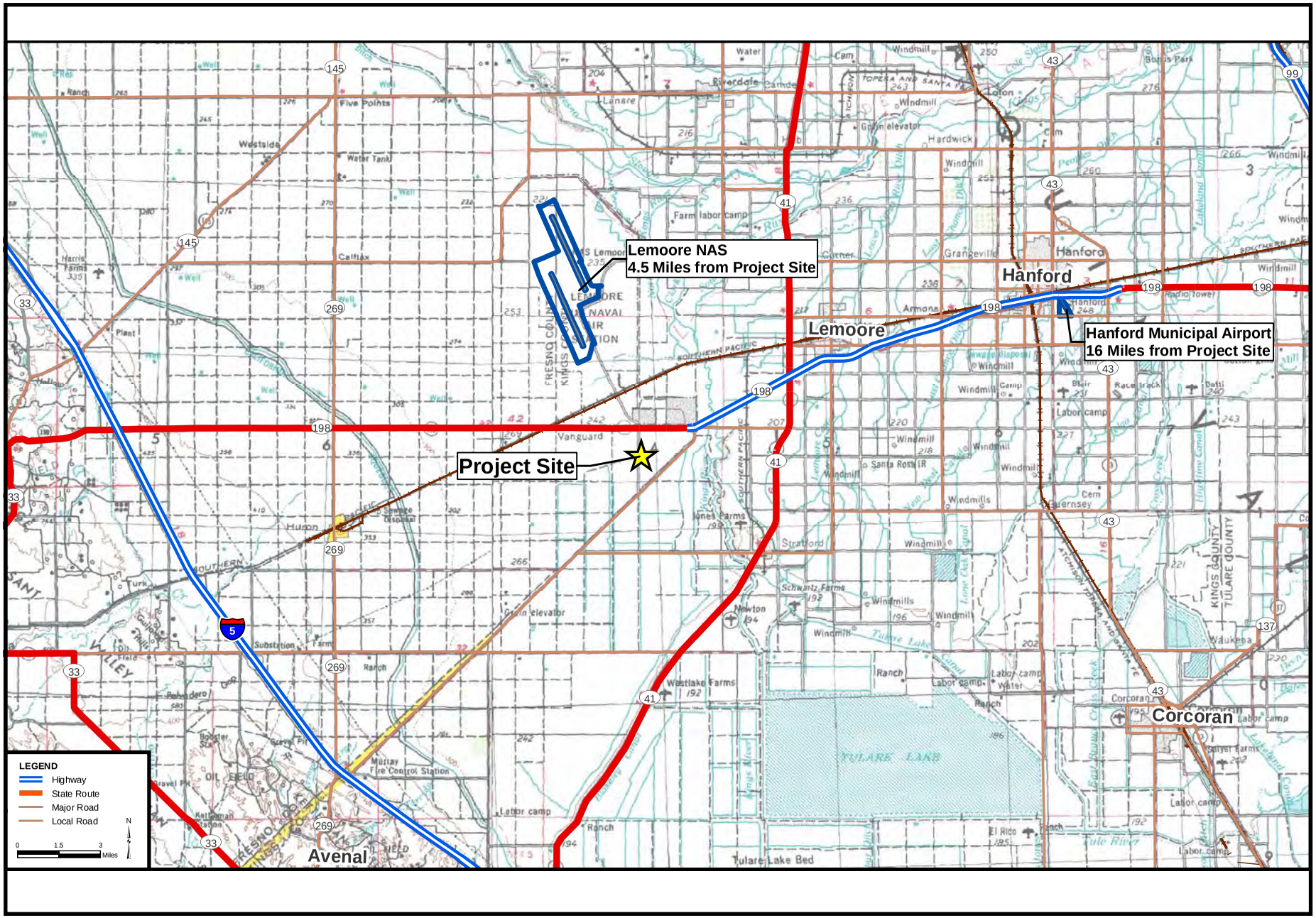
California Streets and Highways Code; Sections 260-263, Scenic Highways.

Kings County General Plan, amended February 10, 1998; www. county of kings/Plan/General Plan.htm.

Kings County Zoning Ordinance, Ordinance Number 269.61, Effective April 28, 2005. County of Kings Planning Department; http://www.countyofkings.com/planning/Plan/Zoning.htm/

VISUAL RESOURCES - FIGURE 1

GWF Henrietta Combined-Cycle Power Plant - Location Map

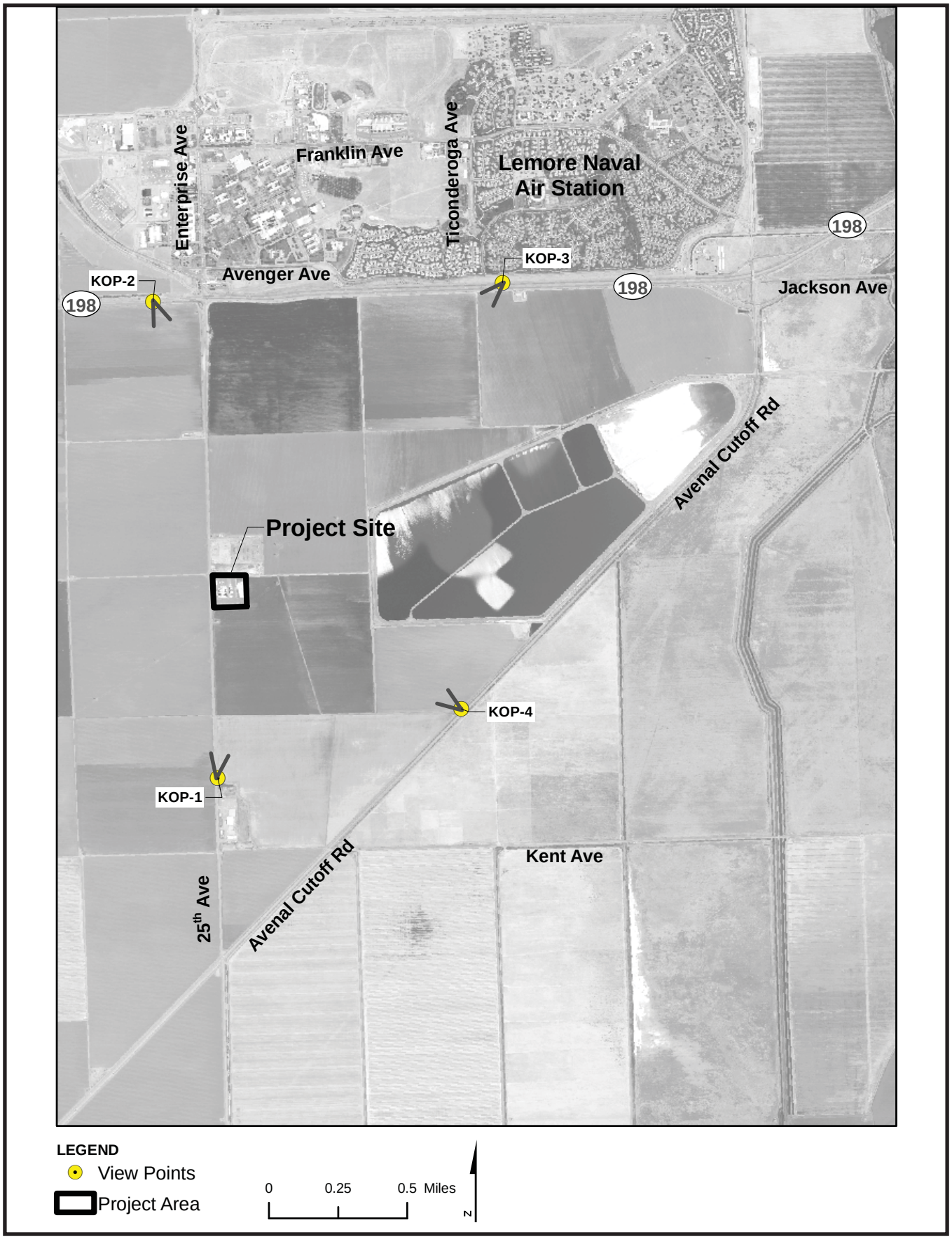


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, NOVEMBER 2009

SOURCE: AFC Figure 1-1

VISUAL RESOURCES - FIGURE 2

GWF Henrietta Combined-Cycle Power Plant - Key Observation Points (KOPs)



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION, NOVEMBER 2009

SOURCE: AFC Figure 3.12-1

VISUAL RESOURCES - FIGURE 3

GWF Henrietta Combined-Cycle Power Plant - KOP 1 - Existing View Looking North from 25th Avenue

SOURCE: AFC Figure 3.12-2a

VISUAL RESOURCES - FIGURE 4

GWF Henrietta Combined-Cycle Power Plant - KOP 1 - Simulated View Looking North from 25th Avenue

SOURCE: AFC Figure 3.12-2b

VISUAL RESOURCES - FIGURE 5

GWF Henrietta Combined-Cycle Power Plant - KOP 2 - Existing View Looking Southeast from State Route 198

SOURCE: AFC Figure 3.12-3a

VISUAL RESOURCES - FIGURE 6

GWF Henrietta Combined-Cycle Power Plant - KOP 2 - Simulated View Looking Southeast from State Route 198

SOURCE: AFC Figure 3.12-3b

VISUAL RESOURCES - FIGURE 7

GWF Henrietta Combined-Cycle Power Plant - KOP 3 - Existing View Looking Southwest from State Route 198

SOURCE: AFC Figure 3.12-4a

VISUAL RESOURCES - FIGURE 8

GWF Henrietta Combined-Cycle Power Plant - KOP 3 - Simulated View Looking Southwest from State Route 198

SOURCE: AFC Figure 3.12-4b

VISUAL RESOURCES - FIGURE 9

GWF Henrietta Combined-Cycle Power Plant - KOP 4 - Existing View Looking Northwest from Avenal Cutoff Road

SOURCE: AFC Figure 3.12-5a

VISUAL RESOURCES - FIGURE 10

GWF Henrietta Combined-Cycle Power Plant - KOP 4 - Simulated View Looking Northwest from Avenal Cutoff Road

SOURCE: AFC Figure 3.12-5b

APPENDIX VR-1: VISIBLE PLUME MODELING ANALYSIS

Testimony of William Walters, P.E.

INTRODUCTION

This appendix contains an assessment of the Henrietta Combined Cycle Power Plant (Henrietta) project gas turbine/once-through steam generator (OTSG) exhaust stack visible water vapor plumes. Staff completed a modeling analysis for the applicant's proposed unabated gas turbine/HRSG design based on data provided by the applicant.

The proposed Henrietta project would utilize the two existing General Electric LM6000 gas turbines, which will be modified to operate in either simple-cycle mode or combined cycle mode. Duct burners are not proposed. The project's steam power cycle cooling is proposed to be done by a new air-cooled condenser that will not cause visible water vapor plumes. The gas turbine has no visible water vapor plume potential when operating in simple cycle mode due to the very high exhaust temperatures in that mode; therefore, only the OTSG exhausts (for example, operating in combined cycle mode) were modeled for potential visible water vapor plumes.

Additionally, the applicant proposed a 42 MMBtu/hr auxiliary boiler and a wet surface air condenser (WSAC) that could create visible water vapor plumes. However, the auxiliary boiler will only operate to generate warming steam for steam turbine casings and steam piping systems during preparation for the start-up of the combined-cycle power plant, which will limit the frequency of use and resulting visible water vapor plumes. Additionally, the small size of the boiler, approximately one tenth of the fuel input of each gas turbine, will limit the size of the plumes to a degree that they are not considered to have the potential to create a significant visual resources impact.

The WSAC if operated with water sprays under very cold conditions could create a visible water vapor plume; however, the project design requires the use of spray water in the WSAC only under extremely warm ambient conditions. That requirement essentially eliminates the potential for visible water vapor plumes from the WSAC.

VISIBLE WATER VAPOR PLUME MODELING METHODS

PLUME FREQUENCY AND DIMENSION MODELING

The Combustion Stack Visible Plume (CSVP) model was used to estimate plume frequency for the gas turbine/HRSG exhausts. This model provides conservative estimates of plume frequency. This model uses estimated hourly exhaust parameters and hourly ambient condition data to determine the plume frequency. This model is based on the algorithms of the Industrial Source Complex model (Version 2), that determine temperatures at the plume centerline, but this model does not incorporate building downwash.

CLOUD COVER DATA ANALYSIS METHOD

A plume frequency of 20 percent of seasonal (November through April) daylight no rain/fog high visual contrast (i.e. "clear") hours is used to determine potential plume

impact significance. The methodology used to determine high visual contrast hours is provided below:

> The Energy Commission has identified a “clear” sky category during which plumes have the greatest potential to cause adverse visual impacts. For this project the meteorological data set[18] used in the analysis categorizes total sky cover as “clear,” “scattered,” “broken,” “overcast,” “partially obscured,” and obscured.” For the purpose of estimating the high visual contrast hours, staff has included in the “Clear” category a) all hours with total sky cover defined as “clear” plus b) half of the non-obscured hours with unlimited ceiling height (i.e. hours with a sky opacity equal to or less than 50 percent). The rationale for including these two components in this category is as follows: a) plumes typically contrast most with sky under clear conditions and b) for a substantial portion of the time when total sky cover is not clear or obscured the opacity of the sky cover is relatively low (equal to or less than 50 percent), and these clouds do not substantially reduce contrast with plumes. Staff has estimated that approximately half of the hours with sky opacity of less than 50 percent can be considered high visual contrast hours and are included in the “clear” sky definition.

If determined that the seasonal daylight clear hour plume frequency is greater than 20 percent, then plume dimensions are calculated; and a significance analysis of the plumes is included in the Visual Resources section.

OTSG VISIBLE WATER VAPOR PLUME MODELING ANALYSIS

Staff evaluated the Applicant’s Amendment Petition (GWF Energy 2008a) and performed an independent psychrometric analysis. The Combustion Stack Visible Plume (CSVP) model was used to estimate the worst-case potential plume frequency for each OTSG stack.

HRSG PARAMETERS

Based on the stack exhaust parameters anticipated by the Applicant, the frequency of visible water vapor plumes can be estimated. The operating data for these stacks are provided in **VISIBLE PLUME Table 1**.

[18] This analysis uses a five year Lemoore Naval Air Station meteorological data set (1992 through 1995 and 1997) that was obtained from the National Climatic Data Center (NCDC).

VISIBLE PLUME Table 1
HRSG Exhaust Parameters [a]

Parameter	HRSG Exhaust Parameters				
Stack Height	91.5 feet (27.89 meters)				
Stack Diameter	9.6 feet (2.93 meters)				
Ambient Conditions	Molecular [b] Weight	Moisture (by mole)	Moisture Content [b] (by weight)	Exhaust Flow Rate (klb/hr)	Exhaust Temp (°F)
Full Load No Duct Firing					
15 °F	28.2	9.33%	5.95%	1,120	288
63 °F	28.4	10.39%	6.58%	1,048	272
115 °F	28.0	11.45%	7.36%	955	283

Source: AFC (GWF Energy 2008a, Attachment C2, Table C2.3)
Note(s): a. Full load operation values that were extrapolated or interpolated between hourly ambient condition data points as necessary.
b. Calculated using exhaust composition data.

VISIBLE PLUME Table 2 provides the CSVP model visible water vapor plume frequency results for year round full load combined cycle operation using a five-year (1992-1995, 1997) Lemoore Naval Air Station meteorological data set, obtained from the NCDC.

VISIBLE PLUME TABLE 2
Staff Predicted Hours with HRSG Steam Plumes
Lemoore NAS 1992-1995, 1997 Meteorological Data

Case	Available (hr)	Plume (hr)	Percent
All Hours	43,824	477	1.09%
Daylight Hours	22,177	119	0.54%
Daylight No Rain No Fog	19,384	10	0.05%
Seasonal Daylight No Rain No Fog*	7,371	10	0.14%
Seasonal Daylight Clear Hours	2,492	6	0.24%

*Seasonal conditions occur anytime from November through April.

A visible water vapor plume frequency of 20 percent of seasonal (November through April) daylight clear hours is used as a plume impact study threshold trigger. Staff's modeling results indicate that the visible water vapor plume frequencies for the project's proposed gas turbine/HRSG are predicted to be well less than 20 percent of seasonal daylight clear hours.

CONCLUSIONS

Visible water vapor plumes from the proposed Henrietta gas turbine/HRSG exhausts are expected to occur infrequently, only under the coldest periods with high relative humidity, well below 20 percent of seasonal daylight clear hours. Therefore, no further visual impact analysis of the expected plume sizes has been completed.

No visible water vapor plumes will be emitted from the air cooled condenser, little to no visible water vapor plumes are expected to be emitted from the WSAC, and visible water vapor plumes from the small auxiliary boiler are not expected to create a significant visual impact.

REFERENCES

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Peaker Power Plant Application for Certification, Docket NO. 01-AFC-18, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Peaker Power Plant Application for Certification (01-AFC-18), Kings County, California, published on December 18, 2001.

WASTE MANAGEMENT
Testimony of Ellen Townsend-Hough

INTRODUCTION

This analysis addresses project changes that would be associated with managing waste generated from demolition, construction, and operation of the proposed combined-cycle modification to the Henrietta Peaker Plant (HPP) and any hazardous wastes already existing on-site. Only those aspects of the HPP that have changed because of the proposed amendment and that affect staff's testimony for **Waste Management**, as contained in the Energy Commission Decision (Decision) dated January 31, 2002 (CEC 2002b), are examined. The modifications to the facility are referred to as GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta). The technical scope of this analysis encompasses solid wastes existing on-site and those generated during facility construction and operation. Wastewater is more fully discussed in the **Soil and Water Resources** section of this document.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) COMPLIANCE

The LORS from the HPP, issued January 31, 2002 have not changed with respect to the changes proposed for GWF Henrietta.

ANALYSIS

Staff reviews whether any existing or potential releases of hazardous substances at a site would pose a risk to public health and environmental receptors. Based on review of the compliance record for the project it does not appear there has been any significant hazardous waste release that indicate site conditions would present a significant risk. In addition, Conditions of Certification **WASTE -4** and **WASTE -5** would ensure that in the event that potentially hazardous conditions were encountered, appropriate mitigation would be implemented.

Staff reviews the capacity available at off-site treatment and disposal sites and determines whether or not the proposed power plant's waste would have a significant impact on the volume of waste a facility is permitted to accept. Staff uses a waste volume threshold equal to 10 percent of a disposal facility's remaining permitted capacity to determine if the impact from disposal waste at a particular facility would be significant.

GWF Henrietta will generate nonhazardous solid waste that will add to the total waste generated in Kings County and in California. The estimated amounts are shown in **WASTE MANAGEMENT Table 1** (GWF-Henrietta).

WASTE MANGEMENT TABLE 1
Waste Generated and Landfill Capacity

	Construction Tons (cubic yards)	**Operation** tons per year (cubic yards per year)	**Landfill Capacity** cubic yards
Non-Hazardous	583.5 (398)	5.1 (3.4)	435,975.3[1]
Hazardous	101.2 (67.5)	0.4 (0.26)	13, 200,000[2]

Notes:

1 Kings County 2007 landfill totals, www.ciwmb.ca.gov/Landfills/Tonnages//Default
2 Combined permitted capacity of Clean Harbors' Buttonwillow Landfill (Kern County) and the Waste Management Kettleman Hills Facility.

Based on **WASTE MANAGEMENT Table 1**, GWF Henrietta's contribution would represent less than 1 percent of the county's total remaining landfill capacity. Staff concludes that disposal of the waste generated during demolition, construction, and operation of GWF Henrietta would not result in any significant adverse impacts. There will be no new or additional unmitigated significant environmental impacts associated with the proposed changes.

CONCLUSIONS AND RECOMMENDATIONS

The project will produce additional process and sanitary wastewater, solid non-hazardous waste and hazardous waste, both liquid and solid. Management of the waste generated during demolition, construction and operation of GWF Henrietta Combined Cycle Power Plant would not result in any significant adverse impacts.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff does not propose modifications to the **Waste Management** Conditions of Certification as listed in the Henrietta Peaker Plant Energy Commission Decision (CEC 2002).

REFERENCES

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Peaker Power Plant Application for Certification, Docket NO. 01-AFC-18, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Peaker Power Plant Application for Certification (01-AFC-18), Kings County, California, published on December 18, 2001.

GWF Henrietta – CH2MHILL. Data Responses 1-11, dated January 2009. Submitted to CEC/Docket Unit on 01/16/09.

ENGINEERING ANALYSIS

FACILITY DESIGN ANALYSIS
Testimony of Steve Baker

INTRODUCTION

GWF seeks approval to convert the Henrietta Peaker Plant (HPP) to a combined cycle power plant by adding a condensing steam turbine generator, two once-through steam generators with selective catalytic reduction and carbon monoxide catalyst, an air-cooled condenser, an auxiliary boiler, a water treatment skid, a step-up transformer and a circuit breaker; and by modifying existing water and drainage systems.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The Energy Commission Decision approving the HPP included 20 Conditions of Certification relating to Facility Design, including **GEN-1** and **GEN-2**. The conditions recognize that the project was to be designed and built in accordance with the 1998 edition of the California Building Code (CBC).

ANALYSIS

The analysis associated with the original application has not changed as a result of the proposed modification, with two minor exceptions. The modifications should be designed and constructed in compliance with the current (2007) edition of the CBC, and some additional components would be added to the project. The conditions of certification included in the original Decision would still apply, with two changes (see below).

CONCLUSIONS AND RECOMMENDATIONS

The proposed modification from a simple cycle peaker to combined cycle will not result in impacts on facility design. Staff recommends approval of this request and proposes the following changes to two existing conditions of certification.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

No mitigation measures are required for Facility Design beyond the requirements embodied in the conditions of certification. Conditions of Certification **GEN-1** and **GEN-2** require revision due to the amendment.

Condition of Certification **GEN-1** must be updated to reflect that the current version of the applicable LORS, the California Building Code, applies to all new construction. **GEN-1** should be revised thus:

GEN-1 The project owner shall design, construct and inspect the project in accordance with the ~~1998~~2007 California Building Code (CBC) and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBC in effect is that edition that has been

adopted by the California Building Standards Commission and published at least 180 days previously.) All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when a successor to the ~~1998~~2007 CBC is in effect, the ~~1998~~2007 CBC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [~~1998 CBC, Section 109~~2007 CBC, Appendix Chapter 1, §110 – Certificate of Occupancy].

Condition of Certification **GEN-2** must be changed to reflect the added equipment embodied in the amendment:

GEN-2 Prior to submittal of the initial engineering designs for CBO review, the project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List, and the Master Specifications List of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures and equipment listed in **FACILITY AND DESIGN Table 1** below. Major structures and equipment shall be added to or deleted from the Table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

FACILITY AND DESIGN Table 1:
Major Structures And Equipment List

Equipment/System	**Quantity (Plant)**
Combustion Turbine Generator Foundation and Connections	2
Steam Turbine Generator Foundation and Connections	1
~~SCR Unit~~Once-Through Steam Generator Structure, Foundation and Connections	2
Transformer Foundation and Connections	~~2~~3
CT Inlet Air Filter/Duct Structure, Foundation and Connection	2
Exhaust Stack Structure, Foundation and Connections	2
Fuel Gas Filter Foundation and Connections	2
Fuel Gas Compressor Skid 1A, 1B, 1C Foundation and Connections	1
Fuel Gas Cooler Foundation and Connections	1
Fuel Gas Waste Sump/Blower Foundation and Connections	1
Gas Turbine Enclosure Structure, Foundation and Connections	2
Steam Turbine Enclosure Structure, Foundation and Connections	1
Steam Turbine Lube Oil Cooler Skid Foundation and Connections	1
Air Cooled Condenser Structure, Foundation and Connections	1
Auxiliary Boiler	1
Auxiliary Boiler Foundation and Connections	1
Ammonia Storage Tank & Pump Foundation and Connections	1
Auxiliary Skid Foundation and Connections	2
Air Compressor Skid Foundation and Connections	1
Oil/Water Separator Foundation and Connections	1
Waste Water Wash Tank Foundation and Connections	1
Fuel Gas Metering Station Structure, Foundation and Connections	1
Administration Building Structure, Foundation and Connections	1
Continuous Emission Monitoring Equipment Foundation and Connections	2
Ammonia Injection Skid Foundation and Connections	2
Raw Water Forwarding Pumps Foundation and Connection	1
Raw Water Storage Tank Foundation and Connections	1
Water Treatment Building	1
Water Treatment Building Foundation and Connections	~~1~~
Water Treatment Module Foundation and Connections	~~1~~2
Waste Water Storage Tank Foundation and Connections	1
Waste Water Process Equipment Foundation and Connections	1
Demineralized Water Storage Tank Foundation and Connections	1
Demineralized Water Injection Forwarding Pumps Foundation and Connections	1
Water Injection Boost Pump Skid 2A, 2B Foundation and Connections	2

Equipment/System	Quantity (Plant)
Sprint Performance Skid Foundation and Connections	2
High Pressure Demineralized Water Filter Skid Foundation and Connections	2
Inlet Air Fogger Foundation and Connections	2
Closed Loop Cooler Foundation and Connections	2
Anti-Icing Heat Exchanger System Foundation and Connections	2
Maintenance Building Structure, Foundation and Connections	1
Power Control Module Structure, Foundation and Connections	1
Emergency Diesel Generator Foundation and Connections	1
Lighting Panel with Transformer Foundation and Connections	1
Auxiliary Transformer Foundation and Connections	2
Gas Compressor Transformer Foundation and Connections	2
480 V Distribution Switchboard Foundation and Connections	1
Gas Compressor 480 V MCC Foundation and Connections	1
4160 Distribution Panel Foundation and Connections	1
Medium Voltage Switch Gear Foundation and Connections	2
Transformer Fire Wall Structure, Foundation and Connections	1 Lot
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
High Pressure and Large Diameter Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
Building Energy Conservation Systems	1 Lot
Switchyard, Buses and Towers	1 Lot
Electrical Duct Banks	1 Lot

REFERENCES

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Peaker Power Plant Application for Certification, Docket NO. 01-AFC-18, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Peaker Power Plant Application for Certification (01-AFC-18), Kings County, California, published on December 18, 2001.

GEOLOGY, MINERAL RESOURCES AND PALEONTOLOGY

Testimony of Dal Hunter, PH.D., C.E.G.

INTRODUCTION

GWF is seeking approval to modify the Henrietta Peaker Plant to convert to combined-cycle operations. This work would include installation of two once-through steam generators, a steam turbine generator and an air cooled condenser, as well as relocation of the existing storm water detention basin, all of which could have a potential effect in the areas of geology, mineral resources and paleontology.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

At the time of certification, LORS applicable to Geology, Mineral Resources, and Paleontology were identified in Staff's Final Staff Assessment. These LORS will continue to apply to the amended project, and no new LORS have been identified. The California Building Code was updated in 2007 edition and is in effect for this proposed project modification.

CONCLUSIONS AND RECOMMENDATIONS

Energy Commission Geology, Mineral Resources, and Paleontology staff reviewed the amendment petition and assessed the impacts of this proposal on environmental quality, public health and safety. It is staff's opinion that revisions to Geology, Mineral Resources, and Paleontology Conditions of Certification are not required and that the project as modified will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

REFERENCES

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Peaker Power Plant Application for Certification, Docket NO. 01-AFC-18, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Peaker Power Plant Application for Certification (01-AFC-18), Kings County, California, published on December 18, 2001.

POWER PLANT EFFICIENCY

Testimony of Erin Bright

INTRODUCTION

GWF Energy, LLC (GWF) seeks approval to convert the 95-MW Henrietta Peaker Plant (HPP) to a 120-MW combined cycle power plant by adding a condensing steam turbine generator, two once-through steam generators with selective catalytic reduction and carbon monoxide catalyst, an air-cooled condenser, an auxiliary boiler, a water treatment skid, a step-up transformer and a circuit breaker; and by modifying existing water and drainage systems.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

There are no LORS that apply to the efficiency of a power plant such as Henrietta.

ANALYSIS

PROJECT ENERGY REQUIREMENTS

The HPP, as certified, was predicted to consume natural gas fuel at a rate of approximately 465 million Btu per hour (MMBtu/hr) per turbine unit, higher heating value (HHV), for a total of 930 MMBtu/hr HHV for the plant.

With the proposed additional power generation equipment in place, Henrietta is predicted to burn natural gas at a nominal rate up to approximately 465 MMBtu/hr (HHV) per turbine unit plus an additional 42 MMBtu/hr by the auxiliary boiler, a total of 972 MMBTU for the plant. While this is an increase over the certified project, it is a relatively small increase. Staff believes this increase in maximum fuel consumption will create no adverse impacts on fuel supplies beyond those analyzed for the project as originally certified.

ENERGY USE EFFICIENCY

Under expected project conditions, electricity would be generated at a full-load efficiency up to approximately 49.6 percent lower heating value (LHV), compared to the 39.2 percent LHV of the original peaking facility at full load operation. The conversion would thus provide a 21 percent improvement in project fuel efficiency at full-load operation, which represents a substantial improvement over the certified project. Energy Commission staff considers this a beneficial impact on energy supplies.

MITIGATION MEASURES AND CONDITIONS

The original project certification includes no Efficiency Conditions of Certification. Energy Commission staff believes no such conditions are warranted by the amendment and propose none.

CONCLUSIONS AND RECOMMENDATIONS

The requested change, converting from a simple cycle peaker plant to a dual function combined cycle plant, would result in significantly improved fuel efficiency. From the standpoint of Power Plant Efficiency, staff recommends that the Petition be granted. This recommendation is based on the following:

1. There will be no new or additional significant impacts associated with Power Plant Efficiency.
2. The amendment is based on new information that was not available during the licensing proceedings.
3. The proposed modification retains the intent of the original Energy Commission Decision.

REFERENCES

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Peaker Power Plant Application for Certification, Docket NO. 01-AFC-18, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Peaker Power Plant Application for Certification (01-AFC-18), Kings County, California, published on December 18, 2001.

POWER PLANT RELIABILITY
Testimony of Erin Bright

INTRODUCTION

GWF Energy, LLC (GWF) seeks approval to convert the 95-MW Henrietta Peaker Plant Project to a 120-MW combined cycle power plant by adding a condensing steam turbine generator, two once-through steam generators with selective catalytic reduction and carbon monoxide catalyst, an air-cooled condenser, an auxiliary boiler, a water treatment skid, a step-up transformer and a circuit breaker; and by modifying existing water and drainage systems.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

There are no LORS that apply to the reliability of a power plant such as Henrietta.

ANALYSIS

In the absence of reliability LORS, Energy Commission staff analyzes the project to determine whether it will likely be built in accordance with the typical industry standards for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves.

From the standpoint of reliability, the overall design of the power plant would be little changed from the certified project. While the two-on-one combined cycle configuration differs from the simple cycle configuration of the certified project in operation, the amended project would function just as reliably. In either configuration, the option exists to operate either one or both of the gas turbines. This redundancy provides a level of reliability that adequately reduces the chance that the entire power plant will be put out of service by a single equipment failure. Any differences in reliability between the certified and amended power plants would rest chiefly on the steam system (steam turbine generator, once through steam generators, auxiliary boiler and air cooled condenser) being added. The amended project makes up for any possible reliability deficiencies in the steam system, however, by retaining its ability to operate in simple cycle mode.

ASSESSMENT OF IMPACTS AND MITIGATION MEASURES

The original project certification includes no Reliability Conditions of Certification. Energy Commission staff believes no such conditions are warranted by the amendment and proposes none.

CONCLUSIONS AND RECOMMENDATIONS

The requested change, converting from a simple cycle peaker plant to a dual function combined cycle plant, would likely have little or no effect on Power Plant Reliability. From this standpoint, staff recommends that the Petition be granted.

REFERENCES

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Peaker Power Plant Application for Certification, Docket NO. 01-AFC-18, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Peaker Power Plant Application for Certification (01-AFC-18), Kings County, California, published on December 18, 2001.

TRANSMISSION SYSTEM ENGINEERING
Testimony of Sudath Arachchige and Mark Hesters

INTRODUCTION

GWF Energy, LLC (GWF), proposes to interconnect a new Steam Turbine (ST) to the existing Henrietta Peaker Plant facility to create the GWF Henrietta Combined-Cycle Power Plant (GWF Henrietta) with a new nominal generating capacity of 120 MW. The interconnection point would be at the 70 kV bus at Pacific Gas & Electric Company's (PG&E) Henrietta substation located adjacent to the GWF Henrietta project site. The planned operation date for the proposed project is May 1, 2012. The detailed descriptions of the design facilities have been discussed in Petition to Amend sections 2.1, 2.3, 2.2.11 and Figure 2.6, pages 2.1 to 2.13.

PROJECT INTERCONNECTION INFORMATION

The GWF Henrietta project would utilize the combine-cycle technology with two existing 48 MW Combustion Turbine (CT) generators and one new 27 MW ST generator with a maximum net output of 120 MW. The new ST generator auxiliary load would be 2 MW, resulting in a maximum ST generator output of 25 MW. The new 32 MVA, 13.8 kV ST generating unit would be connected to the low side of its dedicated 13.8/70 kV and 30/40 megavolt ampere (MVA) generator step-up (GSU) transformer through a 15kV, 2000 ampere gas insulated (SF6) breaker. The High side of the ST generator step-up transformer would be connected to the project's 70 kV Henrietta substation bus through a 70 kV (SF6) breaker capable of carrying full load current.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS) COMPLIANCE

Transmission system engineering is subject to the following LORS:

- California Public Utilities Commission (CPUC) General Order 95 (GO-95*), Rules for Overhead Electric Line Construction,* specifies uniform requirements for the construction of overhead electric lines. Compliance with this order ensures both reliable service and a safe working environment for those working in the construction, maintenance, operation, or use of overhead electric lines, and for the safety of the general public.
- CPUC General Order 128 (GO-128), *Rules for Underground Electric Line Construction,* establishes uniform requirements for the construction of underground electric lines. Compliance with this order also ensures both reliable service and a safe working environment for those working in the construction, maintenance, operation, or use of underground electric lines, and for the safety of the general public.
- National Electric Safety Code 1999 provides electrical, mechanical, civil, and structural requirements for overhead electric line construction and operation.
- California Independent System Operator (California ISO) planning standards also provide the standards and guidelines that assure adequacy, security and reliability

during the planning process of the California ISO's electric transmission facilities. The California ISO planning standards incorporate both the North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) planning standards. With regard to power flow and stability simulations, the California ISO's planning standards are similar to those of the NERC and WECC, and to the NERC's planning standards for transmission system contingency performance. However, the California ISO's standards provide additional requirements that are not found in the NERC or WECC planning standards. The California ISO standards apply to all participating transmission owners that interconnect to both the California ISO-controlled transmission grid, and to neighboring grids not operated by the California ISO (California ISO 2002a).

SCOPE OF SYSTEM IMPACT STUDY (SIS)

The system impact study was performed by Navigant Consulting Inc. (NCI) at the request of GWF Energy to identify the transmission system impacts of the project on PG&E's 115/230/500 kV system. The study included power flow, short circuit studies, and transient and post-transient analysis (GWF 2009a, System Impact Study). The study modeled the proposed project for a net output of 127 MW. The base case was developed from PG&E's 2013 base case series and has a 1-in-10 year extreme weather load for the Greater Fresno Area. The base case included all California ISO approved major PG&E transmission projects, and modeled all proposed higher-queued generation projects that will be operational by 2013. The detailed study assumptions are described in the study. The power flow studies were conducted with and without the GWF Henrietta project connected to PG&E's grid at the Henrietta substation, using 2013 Heavy summer and 2013 Light spring base cases. The power flow study assessed the project's impact on thermal loading of the transmission lines and equipment. Transient and Post-transient studies were conducted using the 2013 Heavy summer base case to determine whether the project would create instability in the system following certain selected outages. Short circuit studies were conducted to determine if GWF Henrietta project would overstress existing substation facilities.

System Impact Study Results:

The System Impact Study identified pre-project overload criteria violations under the 2013 Heavy Summer and 2013 Light Spring conditions. Pre-project overloads are caused by either existing system conditions or by projects with higher positions in the California ISO's generator interconnection queue. The study concludes that the addition of the project would cause a number of pre-existing normal and/or emergency overloads to increase. However, the addition of the project did not result in new overloads.

Overload Mitigation:

Normal Contingency (N-0) mitigation: The power flow study results concluded that the project would cause no new normal overloads and only slightly increased overloads that existed on the Pre-Project case. Pre-project overloads would be mitigated by either PG&E or generators with higher positions in the California ISO generator interconnection queue. Therefore, there is no mitigation needed for N-0 conditions.

Single Contingency (N-1) mitigation: The power flow study results concluded that the project would not result in new overloads. Pre-project overloads would be mitigated by

either PG&E or generators with higher positions in the California ISO generator interconnection queue. Therefore, there is no mitigation needed for N-1 conditions.

Double Contingency (N-2) mitigation: The power flow study results concluded that the project would not result in new overloads under the N-2 contingency analysis. Pre-project overloads would be mitigated by either PG&E or generators with higher positions in the California ISO generator interconnection queue. Therefore, there is no mitigation needed for N-2 conditions.

Dynamic Stability and Reactive Margin Study Results:

The Dynamic stability studies were conducted to determine whether the Henrietta project would create instability following certain outages. The studies indicated that the project did not cause voltage drops of 5 percent or more from the pre-project levels or cause the PG&E system to fail to meet applicable voltage criteria. Dynamic stability and Reactive Margin Study results indicated that the transmission system's performance relative to the applicable reliability guidelines would not be adversely affected by the GWF Henrietta project due to selected disturbances.

Short Circuit Study Results:

Short circuit studies were performed to determine the degree to which the addition of GWF Henrietta project would increase fault duties at PG&E's substations, adjacent utility substations, and the other 115 kV, 230 kV and 500 kV busses within the study area. The buses at which faults were simulated, the maximum three-phase and single-line-to-ground fault currents at these buses with and without the project, and information on the breaker duties at each location are summarized in Table 9.1, Short Circuit Study Results of the System Impact Study Report (GWF Henrietta project, 2009b, SIS tables on Page 12). The SIS indicates that the project would not trigger any circuit breaker upgrades.

CONCLUSION AND RECOMMENDATIONS

- There will be no downstream upgrades in the PG&E system caused by the addition of new capacity to Henrietta substation.

- Additionally, the proposed interconnection will not affect the GWF Henrietta project's ability to comply with all applicable LORS. Therefore, Staff recommends that the following changes to the existing Transmission System Engineering-related conditions of certification to ensure both system reliability and conformance with LORS.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Staff recommends the following changes to the existing Conditions of Compliance applicable to Transmission System Engineering. These changes largely reflect changes in LORS or standard nomenclature applicable to Transmission System Engineering. Conditions of Certification **TSE-4** and **TSE-7** are unchanged and remain in effect as written in the Energy Commission's Decision approving the HPP. Staff is proposing to delete Condition of Certification **TSE-8**, instead moving the provisions regarding

synchronization of the project to Condition of Certification **TSE-6**. New text added is underlined, deleted text is ~~struck through~~.

TSE-1 The project owner shall furnish to the Compliance Project Manager (CPM) and to the Chief Building Official (CBO) a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days prior to the start of construction (or a lesser number of days mutually agreed to by the project owner and the CBO), 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 **TRANSMISSION SYSTEM ENGINEERING 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.

TRANSMISSION SYSTEM ENGINEERING 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 Prior to the start of construction, ~~T~~the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq. ~~and sections 6730 and 6736~~, require~~s~~ state registration to practice as a civil engineer or structural engineer in California.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork,

civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California-registered electrical engineer. The civil, geotechnical or civil, and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes~~;~~ if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

- Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and
- Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days prior to the start of rough grading (or a lesser number of days mutually agreed to by the project owner and the CBO), 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 The project owner shall keep the CBO informed regarding the status of engineering design and construction. 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 ~~the~~ corrective action ~~required~~ (California Building Code, 1998, 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. The discrepancy documentation shall reference this condition of certification.

Verification: The project owner shall submit ~~monthly construction progress reports to the CBO and CPM to be included in response to **TSE-3**. The project owner shall~~

~~transmit~~ a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required obtaining the CBO's approval.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, including the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

1. The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 and General Order 98 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.
2. Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
3. 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.
4. Termination facilities shall comply with ~~CPUC Rule 21 and~~ applicable PG&E interconnection standards.
5. The project conductors shall be sized to accommodate the full output from the project.
6. The project owner shall provide ~~an Executed Generator Special Facilities Agreement.~~ to the CPM:
   a. The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,
   b. A copy of the executed Large Generator Interconnection Agreement (LGIA) signed by the California ISO and the project owner.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lessor number of days mutually agree to by the project owner and CBO), the project owner shall submit to the CBO for approval:

1. Design drawings, specifications, and calculations conforming with CPUC General Order 95 and General Order 98 or NESC; Title 8, California Code of Regulations, Articles 35, 36, and 37 of the "High Voltage Electric Safety Orders"; NEC; ~~CPUC Rule 21,~~ applicable interconnection standards, and related industry standards for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment.

2. 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,"[19] and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC; Title 8, California Code of Regulations, Articles

[19] Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

35, 36 and 37 of the "High Voltage Electric Safety Orders"; NEC; ~~CPUC Rule 21,~~ applicable interconnection standards, and related industry standards.

3. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** 1) through 5) above.

4. ~~Generator Special Facilities Agreement shall be provided concurrently to the CPM and CBO. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CBO and CPM approval.~~The final Detailed Facility Study, including a description of facility upgrades, operational mitigation measures, and/or SPS sequencing and timing if applicable, shall be provided concurrently to the CPM.

TSE-6 ~~The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements TSE-5 a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.~~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: ~~At least sixty (60) days prior to the construction of transmission facilities or a lesser number of days agreed to by the CPM, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to requirements of TSE-5 and request approval to implement such changes.~~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. A report of the 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-8** The Applicant shall provide the following Notice to the California Independent System Operator (Cal-ISO) prior to synchronizing the facility with the California Transmission system:~~

~~3. At least one (1) week prior to synchronizing the facility with the grid for testing, provide the Cal-ISO a letter stating the proposed date of synchronization; and~~

~~4. At least one (1) business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the ISO Outage Coordination~~

~~Department, Monday through Friday, between the hours of 0700 to 1530 at (916)-351-2300.~~

~~**Verification:** The Applicant shall provide copies of the Cal-ISO letter to the CPM when it is sent to the Cal-ISO one (1) week prior to initial synchronization with the grid. A report of conversation with the Cal-ISO shall be provided electronically to the CPM one (1) day before synchronizing the facility with the California transmission system for the first time.~~

REFERENCES

California Energy Commission (CEC). 2002. Decision for the GWF Power Systems Co., Inc., Henrietta Energy Park Peaker Project Application for Certification, Docket No. 01-EP-7, Kings County, published on March 5, 2002.

California Energy Commission (CEC). 2001. Staff Assessment for Henrietta Energy Park Peaker Project Application for Certification (01-EP-7), Kings County, California, published on December 18, 2001.

GWF Energy (GWF Energy LLC/CH2MHILL). 2008a. Henrietta Energy Park Peaker, Petition for License Amendment, Conversion to GWF Henrietta Combined-Cycle Power Plant. Submitted to the California Energy Commission, October 1, 2008.

HENRIETTA PEAKER PROJECT (01-AFC-18C)
PREPARATION TEAM

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POWER PLANT RELIABILITY	Erin Bright
TRANSMISSION SYSTEM ENGINEERING	Sudath Arachchige and Mark Hesters
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MATHEW TRASK

Project Manager, Technical Analyst, Public and Agency Outreach Specialist

ACADEMIC BACKGROUND

B.A., Science and Investigative Journalism, University of California, Santa Cruz
A.S., Engineering, West Valley College, Saratoga

PROFESSIONAL EXPERIENCE

Mathew Trask has more than 24 years of wide-ranging experience in the energy and environmental fields. He previously worked as a power plant operator, electrician, sound and vibration analysis technician, electrical engineer, science journalist, photographer, and public outreach specialist, and is now a consultant working in the energy and environmental fields. He has extensive knowledge of the electric and natural gas utility industry, including the areas of engineering, policy and law, regulation, and marketplace economics. He has a thorough knowledge of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) and has managed environmental assessments conducted under both laws. As a technical analyst, Mr. Trask specializes in visual resources, noise, energy and public utilities, land use and planning, and environmental justice analyses. He has managed public outreach programs and environmental analysis for electric power generating projects, natural gas pipeline and storage projects, water conveyance and storage projects, wineries and vineyards, railroad projects, and telecommunications projects.

Current Employment: Aspen Environmental Group — July 2001 to present

- Siting Project Manager, working as extension to the staff of the California Energy Commission's Systems Assessment and Facilities Siting Division, managing the Commission's review of Applications for Certification (AFCs) submitted by power plant developers seeking licenses to construct new gas-fired power plants (2001-2002). Manage all phases of the CEC's assessment of the potential environmental and technical impacts associated with the construction and operation of new power plants, working closely with division staff and applicant personnel. Staff Assessments include the CEQA-equivalent of an Environmental Impact Report, plus analysis of plant design, reliability and efficiency. Project management includes review and approval of all work products, and the facilitation of workshops and meetings held with the applicant, staff, other agency personnel and the general public concerning various issues related to individual AFCs. Issues include the potential impacts of plant development on listed species under the state and federal Endangered Species Acts, the assessment of proposed cooling and process water sources and conveyance methods, analysis of land use zoning and planning, and assessment of air quality impacts and proposed mitigation measures.

Previous Employment

- Independent Consultant/Senior Technical Analyst, subcontracted through Aspen Environmental Group to the California Energy Commission, conducting initial site assessment under the Peaker Power Plant Permitting Program (2001). Provided initial site assessment of potential peaker power plant sites throughout California. Assessments included establishing contact with the site owner or developer, contacting local and regional governmental agencies for zoning and other information, conducting site tours, and preparing site assessment reports. Reports included analysis of natural gas and electric transmission infrastructure needs and availability, and of potential impacts a peaker plant project could have on air quality, biological resources, cultural resources, hazardous materials, land use and planning, noise, public services, traffic and parking, and visual resources. Because of the need for expediency, all reports were provided electronically, and included several digital photographs, via e-mail and compact-disk.

- Project Manager/Technical Analyst for the California Public Utility Commission (CPUC), as an Independent Contractor and an employee of Environmental Science Associates (ESA), for the

divestiture of more than 35 power plants and associated assets by San Diego Gas and Electric Company (SDG&E), Pacific Gas and Electric Company (PG&E) and Southern California Edison Company (Edison); 1997 to 2001. Worked as Project Manager and technical analyst for the CEQA review of applications by the state's three largest utilities to sell or market value their thermal power plants. Managed all public process, conducted technical analysis and wrote several sections of the Initial Study and the Mitigated Negative Declaration for SDG&E's and Edison's Divestiture Applications. Also conducted public outreach programs and provided analysis for the CPUC for the Initial Study and Mitigated Negative Declaration for PG&E's first divestiture application; and for the Environmental Impact Report (EIR) for PG&E's second divestiture application, including analysis for the project alternatives, findings of significance, utility and services, and energy and natural resources sections. Also wrote responses to agency and public comments as part of the Final EIR for PG&E's second divestiture application. Worked with CPUC Project Managers Martha Sullivan, Bruce Kaneshiro, Andrew Barnsdale, Judith Iklé and Billie Blanchard to arrange and facilitate more than 60 public meetings, conferences and workshops with government officials, community leaders and industry stakeholders involved in the divestiture.

- Project Manager and Technical Analyst for the Napa County Conservation, Development and Planning Department; 2000. As an Independent Consultant, managed the production of the Environmental Impact Report on the application by Beringer Wine Estates to develop a 25 million square feet winery and associated vineyard on a 210-acre site near the Napa County Airport. This facility, when built, will be the largest winery in Napa County, and one of the five largest in the country. Working closely with the County Planning Department and the County Counsel's office, this EIR was produced on a fast track and was completed in less than half the time normally allotted for similar projects. Also managed the consultation process under the federal Endangered Species Act with the Army Corps of Engineers and the US Fish and Wildlife Service related to the presence of an endangered species, the vernal pool fairy shrimp (*Branchinecta conservatio*), on the development site. Challenging issues included the calculating air quality impacts from the expected hundreds of daily truck trips to and from the facility, the delineation of wetlands on the site, determining conformance with local planning guidelines and zoning ordinances, and analyzing the expected water quality effects on nearby No-Name Creek, Fagan Slough, and Napa River.

- Technical Analyst/Independent Consultant for the City of South Gate for evaluation of the Application for Certification submitted to the California Energy Commission by Sunlaw Energy for authority to construct and operate the planned Nueva Azalea Power Plant Project in the City of South Gate; 2000. If approved, the Nueva Azalea plant would have been a 550 MW natural gas-fired combined cycle power plant located at the eastern edge of the city limits on a 13.5-acre site next to the 710 Interstate Freeway. Conducted visual resources analysis of the innovative project design and planned lighting display as to whether its would constitute a safety hazard to drivers on the 710 Freeway; also analyzed environmental justice issues and conducted an evaluation of the plant engineering design and the eight transmission options for interconnecting the project at a nearby Southern California Edison substation.

- Technical Analyst for the National Park Service on the Comprehensive Management Plan and accompanying Environmental Impact Statement for the Merced River through Yosemite National Park following designation of the waterway as a Wild and Scenic River; ESA, 2000. Conducted visual resources, land use, and public services (Park Operations) analyses to determine the potential impacts in those areas resulting from implementing any of five alternatives for the Management Plan, as required by the Wild and Scenic Rivers Act and the National Park Organic Act. Issues included balancing the preservation of traditional viewing places along the river of the granite features along the walls of the Yosemite Valley with the need to preserve the wild state of the river and its banks.

- Project Manager for Public Outreach and Environmental Impact Report Production for the CPUC for the proposed Lodi Gas Storage Project; 1998-1999. As an employee of Public Affairs Management

(PAM), conducted public outreach and environmental analysis, and managed production of the EIR for the CPUC's CEQA review of the application by Western Hub Services to develop a new gas storage project near Lodi and a related 31-mile pipeline to connect the facility to PG&E's pipeline system. Major environmental issues included wetlands impact and public safety concerns for seven major waterway crossings, and visual impacts of project development. Management of the public process was especially challenging, with more than 350 people attending the public meetings arranged for this controversial project.

- Technical Analyst for the Bay Area Water Users Association's (BAWUA's) Water System Master Plan (WSMP); PAM, 1998-1999. Coordinated the planning process for the 31-agency BAWUA in its first attempt in 25 years to craft a new comprehensive plan for the management of water resources from the City and County of San Francisco's Hetch Hetchy Water and Power system. Conducted analysis of water supply alternatives, new facility proposals, and conservation methods, and helped facilitate WSMP committee meetings. Also conducted technical analysis and public outreach for the City and County of San Francisco for its plan to develop a recycled water system.

- Technical Analyst/Project Manager for the Section of Environmental Analysis of the US Department of Transportation's Surface Transportation Board for the environmental reviews under NEPA of several railroad mergers and acquisition applications, including the merger of the Union Pacific and Southern Pacific railroads, and the acquisition of Conrail by Norfolk Southern and CSX Corporation; PAM, 1997-1998. Major work included: analysis of impact from increased rail traffic on surface street traffic patterns and emergency vehicle access in Reno, Wichita, and the greater Cleveland metropolitan area; conducting outreach efforts with Native American Tribes and the general public in the Reno area, concerning impact on local fisheries; and analysis of Environmental Justice issues related to rail traffic in low-income areas.

- Project Manager/Independent Consultant, Power Plant Maintenance System Analysis, Kansai Electric; 1995-1997. Managed production of a series of major reports for Japan's largest electric utility on the practices of US electric utilities in the management of preventative and corrective maintenance programs at gas-fired, coal-fired, nuclear, biomass, wind and geothermal power plants. Kansai was seeking to diversify its generation base as a means of increasing system reliability and reducing its reliance on a single power plant technology (i.e., nuclear power) to produce power in the greater Tokyo Bay area. Produced six major reports, each greater than 300 pages, and dozens of follow-up reports providing cost/benefit analysis, including environmental costs and benefits, of power plant upgrades or replacements.

- Managing Editor, Clearing Up and California Energy Markets newsletters; Energy NewsData 1990-1995. Managed production and wrote more than 1,000 articles for these two weekly publications covering the integrated electric and natural gas utility industry in the Western Half of North America, including the areas of marketplace economics, policy and law, regulation, and research and development. Over more than five years on staff, covered the US Congress and Executive Branch, the California Legislature and Governor's office, state and federal court systems, the California Public Utility Commission and California Energy Commission, the Federal Energy Regulatory Commission, the Bonneville and Western Area Power Administrations, the North American Electric Reliability Council, and the US Department of Energy.

- Information Specialist/Business Development Specialist for the National Center for Appropriate Technology; 1988-1989. Provided technical and economic analysis for dozens of new energy projects, ranging from small run-of-the-river hydroelectric projects to large wind farms. Specialized in site suitability assessment for wind, biomass and solar power applications, and in assisting small businesses in startup of new energy projects, including cost/benefit analysis, permitting, and financing.

DECLARATION OF
Matt Trask

I, **Matt Trask** declare as follows:

1. I am presently under contract through Aspen Environmental Group to the California Energy Commission in the **Compliance Unit** of the Siting, Transmission and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony in Executive Summary, Introduction and Project Description for the Henrietta Combined-Cycle Power Plant based on my independent analysis of the Petition to Amend the project and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: October 28, 2009 Signed: _____

At: Sacramento, California

WILLIAM WALTERS, P.E.
Air Quality Specialist

ACADEMIC BACKGROUND
B.S., Chemical Engineering, 1985, Cornell University

PROFESSIONAL EXPERIENCE

Mr. Walters has over 20 years of technical and project management experience in environmental compliance work, including environmental impact reports, emissions inventories, source permitting, energy and pollution control research RCRA/CERCLA site assessment and closure, site inspection, and source monitoring,.

Aspen Environmental Group 2000 to present

Responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- **Engineering and Environmental Technical Assistance to Conduct Application for Certification Review for the California Energy Commission:**
  - Preparation and project management of the air quality section of the Staff Assessment and/or Initial Study and the visual plume assessment for the following California Energy Commission (CEC) licensing projects: Hanford Energy Park; United Golden Gate, Phase I; Huntington Beach Modernization Project (including Expert Witness Testimony); Woodland Generating Station 2; Ocotillo Energy Project, Phase I; Magnolia Power Project; Colusa Power Project; Inland Empire Energy Center; Rio Linda/Elverta Power Plant Project; Roseville Energy Center; Henrietta Peaker Project; Tracy Peaking Power Plant Project (including Expert Witness Testimony); Avenal Energy Project; San Joaquin Valley Energy Center (including expert witness testimony); Salton Sea Unit 6 Project (including expert witness testimony); Modesto Irrigation District Electric Generation Station (including expert witness testimony); Walnut Energy Center (including expert witness testimony); Riverside Energy Resource Center (including expert witness testimony); Pastoria Energy Facility Expansion; Panoche Energy Center; Starwood Power Plant; and Riverside Energy Resource Center Units 3 and 4 Project (in progress).
  - Preparation and project management of the visual plume assessment for the following California Energy Commission (Energy Commission) licensing projects: Metcalf Energy Center Power Project (including Expert Witness Testimony); Contra Costa Power Plant Project (including Expert Witness Testimony); Mountainview Power Project; Potrero Power Plant Project; El Segundo Modernization Project; Morro Bay Power Plant Project; Valero Cogeneration Project; East Altamont Energy Center (including expert witness testimony); Russell City Energy Center; SMUD Cosumnes Power Plant Project (including expert witness testimony); Pico Power Project; Blythe Energy Project Phase II; City of Vernon Malburg Generating Station; San Francisco Electric Reliability Project; Los Esteros Critical Energy Facility Phase II; Roseville Energy Park; City of Vernon Power Plant; South Bay Replacement Project; Walnut Creek Energy Park; Sun Valley Energy Project; Highgrove Power Plant; Colusa Generating Station; Russell City Energy Center; Avenal Energy Project; Carlsbad Energy Center; Community Power Project; Panoche Energy Center; San Gabriel Generating Station; Sentinel Energy Project; and Victorville 2 Hybrid Power Project.
  - Assistance in the aircraft safety review of thermal plume turbulence for the Riverside Energy Resources Center; Russell City Energy Center Amendment (including expert witness testimony); Eastshore Energy Power Plant (including expert witness testimony); Carlsbad Energy Center (in progress), Riverside Energy Resource Center Units 3 and 4 Project; Victorville 2 Hybrid Power Project; and the Blythe Energy Power

Plant and Blythe Energy Project Phase II (including expert witness testimony) siting cases. Assistance in the aircraft safety review of thermal and visual plumes of the operating Blythe Energy Power Plant. Preparation of a white paper on methods for the determination of vertical plume velocity determination for aircraft safety analyses.

- Preparation and instruction of a visual water vapor plume modeling methodology class for the CEC.
- Preparation and project management of the public health section of the Initial Study for the Woodland Generating Station 2 Energy Commission licensing project.
- Preparation of project amendment or project compliance assessments, for air quality or visual plume impacts, for several licensed power plants, including: Metcalf Energy Center; Pastoria Power Plant; Elk Hills Power Plant; Henrietta Peaker Project; Tracy Peaker Project; Magnolia Power Project; Delta Energy Center; SMUD Cosumnes Power Plant; Walnut Energy Center; San Joaquin Valley Energy Center; City of Vernon Malburg Generating Station; Otay Mesa Power Plant; Los Esteros Critical Energy Facility; Pico Power Project; Riverside Energy Resource Center; Blythe Energy Project Phase II; Inland Empire Energy Center; Salton Sea Unit 6 Project; and Starwood Power-Midway Peaking Power Plant.
- Preparation of the air quality section of the staff paper "A Preliminary Environmental Profile of California's Imported Electricity" for the Energy Commission and presentation of the findings before the Commission.
- Preparation of the draft staff paper "Natural Gas Quality: Power Turbine Performance During Heat Content Surge", and presentation of the preliminary findings at the California Air Resources Board Compressed Natural Gas Workshop and a SoCalGas Technical Advisory Committee meeting.
- Preparation of the staff paper "Emission Offsets Availability Issues" and preparation and presentation of the Emission Offsets Constraints Workshop Summary paper for the Energy Commission.
- Preparation of information request and data analysis to update the Energy Commission's Cost of Generation Model capital and operating cost factors for combined and simple cycle gas turbine projects. Additionally, performed a review of the presentation for the revised model as part of the CEC's 2007 Integrated Energy Policy Report workshops, and attended the workshop and answering Commissioner questions on the data collection and data analysis.

- For the **Los Angeles Department of Water and Power (LADWP)**:
  - Preparation of the Air Quality Inventory for the LADWP River Supply Pipeline Project EIR.
  - Project management and preparation of the Air Quality Section for the LADWP Valley Generating Station Stack Removal IS/MND support project.
- For the **U.S. Army Corps of Engineers (Corps)**:
  - Preparation of the Air Quality Section and General Conformity Analysis for the Matilija Dam Ecosystem Restoration Project EIS/R for the Corps.
  - Preparation of emission inventory and General Conformity Analysis of the Murrieta Creek Flood Control Project and the Joint Red Flag exercise to be conducted in the Nevada Test and Training Range.
  - Emission inventory for the construction activities forecast for the San Jose/Old San Jose Creeks Ecosystem Restoration project for the Corps.
- **Other Projects:**
  - Preparation of the Air Quality Section of the LAUSD New School Construction Program EIR and provided traffic trip and VMT calculation support for the Traffic and Transportation Section.
  - Preparation of the draft staff paper "Natural Gas Quality: Power Turbine Performance During Heat Content Surge", and presentation of the preliminary findings at the California Air Resources Board Compressed Natural Gas Workshop and a SoCalGas Technical Advisory Committee meeting.

- Preparation of the Air Quality Section of the Environmental Information Document in support of the Coastal Consistency Determinations for the suspension of operation requests for undeveloped units and leases off the Central California Coast.
- Preparation of comments on the Air Quality, Alternatives, Marine Traffic, Public Safety, and Noise section of the Cabrillo Port Liquefied Natural Gas Deepwater Port Draft EIS/EIR for the City of Oxnard.
- Preparation of the emission estimates used in the Air Quality Sections for the DWR Tehachapi Second Afterbay Project Initial Study and EIR.

Camp Dresser & McKee, Inc. 1998 to 2000

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Preparation of emission inventories and dispersion modeling for criteria and air toxic pollutants for the Los Angeles International Airport Master Plan (LAXMP) EIS/EIR.
- Project Manager/Technical lead for the completion of air permit applications and air compliance audits for two Desa International fireplace accessory manufacturing facilities located in Santa Ana, California.
- Project manager/technical lead for the completion of Risk Management Plans (RMPs) for four J.R. Simplot food processing facilities in Oregon, Idaho, and Washington and the Consolidated Reprographics facility located in Irvine, California.

Planning Consultants Research 1997 to 1998

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Project Manager for a stationary source emission audit of the entire Los Angeles International Airport complex for Los Angeles World Airports (LAWA) in support of the LAXMP.
- Review of the Emission Dispersion Modeling System (EDMS) and preparation of a report with findings to the Federal Aviation Administration for LAWA in support of the LAXMP.
- Project manager for the ambient air monitoring and deposition monitoring studies performed for LAWA in support of the LAXMP, including the selection of the monitoring sites and specialty subcontractor, and review of all monitoring data.

Aspen Environmental Group/Clean Air Solutions 1995 to 1996

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Manager of the Portland, Oregon, office of Clean Air Solutions from March 1995 to December 1995, with responsibilities including Project Management, Business Development, and Administration.
- Control technology assessment, engineering support and Notice of Intent to construct preparation for J.R. Simplot’s Hermiston, Oregon, food processing facility. Review and revision of an Air Contaminant Discharge Permit application, Title V permit application, and PSD modeling analysis for J.R. Simplot's Hermiston facility.

- Air quality compliance report including an air emission inventory, regulation and permit compliance determination, and recommendations for compliance for Lumber Tech, Inc.'s Lebanon, Oregon, wood products facility.

Fluor Daniel, Inc. 1990 to 1995 and 1996 to 1997

Mr. Walters was responsible as lead technical or project manager for major environmental projects for both government and private clients. His projects included:

- Prepared several air permit applications for the ARCO Los Angeles Refinery Polypropylene Plant Project; Phase I environmental assessments for properties located in Southern California; and a site investigation and RCRA closure plan for a hazardous waste storage site in Vernon, California.
- Project manager of the Anaconda Smelter site for the U.S. Environmental Protection Agency's (EPA) Alternative Remedial Contract System (ARCS) project during the conclusion of technical activities and project closeout. Prepared a cost recovery report for the project.
- Performed environmental analysis for the Bonneville Power Authority, including air pollution BACT analysis, wastewater analysis, and evaluation of secondary environmental effects of electric power producing technologies.

Jacobs Engineering Group 1988 to 1990

Mr. Walters was responsible for a wide range of air pollution regulatory and testing projects, including the following:

- Project manager of air toxic emission inventory reports prepared for U.S. Borax's boron mining and refining facility and the Naval Aviation Depot (N. Island Naval Base, San Diego, California).
- Prepared air permit applications and regulatory correspondence for several facilities including the U.S. Department of Energy's Feed Material Production Center uranium processing facility in Fernald, Ohio; Evaluation of a sludge dewatering process at Unocal's Wilmington, California, Refinery; and United Airlines blade repair facility at the San Francisco Airport.
- Characterized and quantified air emissions for offshore oil and gas development activities associated with Federal oil and gas Lease Sale 95, offshore southern California, for the U.S. Minerals Management Service.

CERTIFICATIONS

- Chemical Engineer, California License 5973
- CARB, Fundamentals of Enforcement Seminar
- EPA Methods 1-8, 17; Training Seminar

AWARDS

- California Energy Commission Outstanding Performance Award 2001

DECLARATION OF
Will Walters, P.E.

I, Will Walters, declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as a senior associate in engineering and physical sciences.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Air Quality** and **Visual Resources**, for the Henrietta Combined-Cycle Power Plant Conversion Amendment based on my independent analysis of the Petition for Amendment and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: September 17, 2009 Signed: _____

At: Agoura Hills, California

MATTHEW S. LAYTON

Experience Summary

Twenty five years of experience in the electric power generation field, including regulatory compliance and modification; research and development; licensing of nuclear, coal-fired, peaking and combined cycle power plants; and engineering and policy analysis of regulatory issues.

Education

B.S., Applied Mechanics, University of California, San Diego.

Registered Professional Engineer - Mechanical, California.

Experience

1987-present – Senior Mechanical Engineer, Systems Assessment and Facilities Siting Division, California Energy Commission. Review and evaluate power plant proposals, identify issues and resolutions; coordinate with other agencies; and prepare testimony, in the areas of:

- Air quality resources and potential impacts, and mitigation measures;
- Public Heath; and
- Transmission Line Safety and Nuisance.

Prepared Commission demonstration project process; contributed to the Energy Technology Status, Energy Development, and Electricity Reports; Project Manager for demonstration projects; evaluated demonstration test plans, procedures, data and reports; disseminated test results; and managed research and development contracts.

1983-1986 -- Control Systems Engineer, Bechtel Power Corporation. Managed a multi-disciplined effort to environmentally qualify client's safety related nuclear plant equipment. Performed analyses, calculations and reviews against vendor test reports, NRC guidelines and plant normal and postulated accident conditions. Initiated purchase orders for testing and formulated test objectives and test plans. Developed and implemented plant equipment maintenance and surveillance program based on test results, vendor recommendations and industry operating experiences. Trained client in environmental qualification engineering analysis and equipment maintenance program. Prepared client for NRC audits and presentation.

1981-1983 -- Engineer, GA Technologies, Inc. Supervised design and procurement of full-scale test assembly used to evaluate design changes to operating reactor graphite core assembly. Conducted experiment to determine the relationship of graphite oxidation rate to water concentration, temperature, and helium pressure. Environmentally qualified essential and safety related nuclear power plant equipment to comply with NRC guidelines.

DECLARATION OF
MATTHEW S. LAYTON

I, Matthew S. Layton, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a Supervising Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the greenhouse gas analysis in the Air Quality section for the Henrietta Combined-Cycle Power Plant Final Staff Assessment based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/23/09

Signed: Matthew Layton

At: Sacramento, California

Brian McCollough
1516 Ninth Street MS 40
Sacramento, CA 95814-5504
(916) 653-1648 email: bmccollo@energy.state.ca.us

Education

School	Field	Degree	Year
Rice University	Biology	B.A	1998
UC Davis Extension	Land Use & Enviro. Planning	Certificate	2001

Experience

State of California, California Energy Commission *2007 to present*
Planner I, Siting, Transmission, and Environmental Protection Division, Biological Resources Unit,
All tasks related to the production of the biological resources sections of CEQA-equivalent (California Environmental Quality Act) documents for the environmental review of proposed power plants in California, including: Evaluating data in applications; writing data requests to applicants and doing independent research to evaluate the potential for sensitive biological resources subject to significant impacts from proposed projects; providing and receiving information in public hearings on applications; analyzing all pertinent data; writing Staff Assessments of impacts; developing mitigation measures to reduce to insignificant any impacts to biological resources; providing expert testimony on my analyses and findings in public hearings; and reviewing compliance with mitigation measures during the construction, operation, and decommissioning of certified power plants. Additional tasks include: providing prefiling assistance to applicants, reviewing the CEQA documents of sister state agencies; consulting and advising biological resources specialists in sister state agencies; coordinating and reviewing the work of Commission biological resources consultants; and developing internal procedures and guidelines to improve biological resources review of applications.

EDAW, Inc. *2001 to 2003*
Biologist and compliance monitor.
Wrote biological resource sections for projects undergoing environmental permitting review, including researching potential impacts to biological resources that could result from construction of proposed projects, and development of appropriate mitigation measures to reduce those impacts to less-than-significant levels, in consultation with appropriate agencies, local governments, and clients. Monitored projects for compliance with local, state, and federal laws, including compliance with environmental permitting conditions..

Department of Ecology and Evolutionary Biology, Rice University *1994 to 1997*
Research Assistant, Forest Ecology
Assisted with the ongoing research of Dr. Paul Harcombe into the dynamics of several long-term study plots in the forests of the Big Thicket, Texas. Managed field crews, collected, organized, and analyzed data, and designed and conducted a study of lighting conditions in the study plots using scanned hemispherical canopy photos. Also assisted in the installation of local climate stations with data loggers and dendrometer bands on selected trees in an attempt to correlate local climate data to seasonal woody growth so as to model how the forest may respond to potential climate change scenarios.

DECLARATION OF
Brian McCollough

I, **Brian McCollough** declare as follows:

1. I am presently employed by the California Energy Commission in the **Biological Resources Unit** of the Siting, Transmission and Environmental Protection Division as a **Planner I**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Biological Resources** for the GWF Henrietta Combined-Cycle Power Plant based on my independent analysis of the Petition to Amend the project and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

   I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/23/2009 Signed: _____

At: Sacramento, California

Beverly E. Bastian
1516 Ninth Street MS 40
Sacramento, CA 95814-5504
(916) 654-4840 email: bbastian@energy.state.ca.us

Education	Field	Degree	Year
University of California, Davis	Anthropology	B.A	1967
University of California, Davis	Anthropology	M.A	1969
Tulane University	Anthropology	A.B.D.	1975
University of Mississippi	American History	(courses only)	1989
University of California, Santa Barbara	Public (American) History and Historic Preservation	A.B.D.	1996

Experience

State of California, California Energy Commission *2005 to present*
Planner II, Siting, Transmission, and Environmental Protection Division, Environmental Office, Biological and Cultural Unit
All tasks related to the production of the cultural resources sections of CEQA-equivalent (California Environmental Quality Act) documents for the environmental review of proposed 50-MW+ power plants in California, including: Evaluating data in applications; writing data requests to applicants and doing independent research to compile an inventory of and evaluate the historical/cultural significance of cultural resources subject to significant impacts from proposed projects; providing and receiving information in public hearings on applications; analyzing all pertinent data; writing Staff Assessments of impacts; identifying California Register of Historical Resources-eligible cultural resources; developing mitigation measures to reduce to insignificant any impacts to Register-eligible cultural resources; providing expert testimony on my analyses and recommendations in public hearings; and reviewing compliance with mitigation measures during the construction, operation, and decommissioning of certified power plants. Additional tasks include: providing prefiling assistance to applicants; coordinating environmental review of power plant projects with cultural resources specialists in sister state agencies and in federal agencies; supervising and reviewing the work of Commission cultural resources consultants; reviewing the CEQA documents of sister state agencies; and developing internal procedures and guidelines to improve cultural resources review of applications.

State of California, Department of Parks and Recreation *2001 to 2005*
Historian II, Cultural Resources Division, Cultural Resources Support Unit
Major and complex historical and historic architectural investigations and studies dealing with the significance, integrity, and management of historic buildings, structures, and landscapes in California's state parks; participation in interdisciplinary teams and project assignments; preparation of technical reports and correspondence; inventorying and evaluating historic properties; coordinating the statewide registration of historical properties; assessing the eligibility of historic properties to the National Register of Historic Places and the California Register of Historical Resources; reviewing environmental documents and providing technical analyses of major Departmental projects to determine impacts to cultural resources under State and federal laws; identifying resource issues and constraints; establishing allowable use and development guidelines; developing approaches to protect, enhance, and perpetuate cultural resources under relevant State and federal laws, regulations, and standards; proposing and developing programs, policies, and budgets to meet Department's historic preservation missions.

Department of Social Sciences, American River College *2000 to 2002*
Instructor (part-time), American History
Creation and presentation of classroom lectures, selection of assigned texts and readings, creation and administration of quizzes and examinations, assignment and supervision of student research papers, student consultation in office hours, grading of all quizzes, tests, and papers, and assigning final student grades. These research, organizing, and teaching skills demonstrate ability to organize information, to speak effectively to the public, and to train and direct other personnel.

Department of Sociology and Anthropology, University of Mississippi *1987 to 1989*
Archaeologist, Center for Archaeological Research
All tasks for the completion of the historical archaeological part of an archaeological survey and testing program final report related to a U. S. Army Corps of Engineers erosion control project in twelve north-central Mississippi counties, including: Coordinating the activities of a field crew and the research of historians working in archives; setting up an artifact database using survey data to generate statistical summaries for discovered historical archaeological sites; gathering historical settlement and land-use data for twelve counties; conducting a special statistical analysis and synthesis of historical data only, focusing on pre-and post-Civil War land tenure and agricultural production for plantations in two counties where soil fertility contrasted; synthesizing data from all sources, collaborating on the final cultural resources management report with archaeologists specializing in prehistory and survey and sampling methodology; presenting findings at the annual meeting of the Society for Historical Archaeology in 1989.

Gilbert Commonwealth, Inc. *1984 to 1987*
Historical Archaeologist and Project Manager, Environmental Unit
All tasks as Principal Investigator for six major historical archaeological and/or historical architectural cultural resources management projects done under contract to federal, state, and local governments, including: Writing winning proposals for these projects; negotiating and managing project budgets; gathering/supervising the gathering of historical, oral historical, and archaeological data; analyzing/supervising the analysis of gathered data; and writing/supervising the writing of reports of findings, along with the creation of maps, illustrations, and data tables for these reports; serving as the historian and historical preservationist on several multidisciplinary teams tasked with siting the routes for several major power lines in east Texas.

Tennessee Valley Authority (personal services contract) *1979 to 1981, 1983-1984*
Historical Archaeologist (self-employed)
All tasks as Principal Investigator for various cultural resources management projects in areas affected by TVA construction, the most significant of which were: the complete excavation of and report on seven nineteenth-century log-cabin sites in Cedar Creek Reservoir in northwestern Alabama; and all historical research, the field work, and the report for the underwater remote-sensing reconnaissance and underwater videotaping of sunken Civil War cargo boats and gunboats at Johnsonville, Tennessee, in the western part of the Tennessee River.

Other Archaeological Projects *1966 to 1981*

Professional Societies

Register of Professional Archaeologists, #10683
Society for Historical Archaeology
National Council on Public History
Vernacular Architecture Forum
Society for California Archeology
California Council for the Promotion of History

DECLARATION OF
Beverly E. Bastian

I, **Beverly E. Bastian**, declare as follows:

1. I am presently employed by The California Energy Commission in the **Siting, Transmission, and Environmental Protection Division** as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Cultural Resources,** for the Henrietta Peaker Plant, based on my independent analysis of the Petition to Amend the project and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 25, 2009 Signed: Beverly E. Bastian

At: Sacramento, California

Resume of Robert Fiore
Planner II
California Energy Commission (CEC)
Siting, Transmission and Environmental Protection

Experience Summary:

August '08 to Present
California Energy Commission (CEC), Siting, Transmission and Environmental Protection – Prepare staff analyses pertaining to Land Use, Transportation and Traffic, Visual Resources and Socioeconomics; assess and evaluate power plant siting projects for compliance with laws, ordinances, regulations and standards (LORS) and for potential environmental impacts; manage and prioritize multiple power plant siting projects; process amendment petitions; formulate conditions of certification; interpret codes, ordinances and policies; understand systems and processes; perform entitlement processing; participate in site visits to provide community perspective; prepare testimony and make presentations in public; and coordinate the work of multidisciplinary specialists. Projects include Orange Grove Project, San Joaquin Solar and Salton Sea Unit 6.

Oct. 2002 - March 2008
Civil Engineering Consulting – Assemble and lead project teams consisting of planners, engineers, architects, consultants and technicians to develop large-scale master planned communities; direct projects from pre-acquisition, through site assessment and project approval, to construction by coordinating external and internal acquisition, planning, design and construction departments or consultants; perform due diligence and site assessments; calculate development costs and manage multi-million dollar project budgets; and, solve problems related to site and infrastructure design, soils, traffic, environmental impacts, utility placement, housing, recreation, architecture, landscaping, rights-of-way, etc.

June 1998 – Aug. 2002
Planning and Financial Consulting - Power plant siting and expansion planning and permitting in response to the power crisis; facility assessments and survey including total ownership costs, life cycle costs, alternatives evaluation and recommendations; calculate costs and apportionments and integrate databases; ensure federal, state and local regulatory compliance; perform trend analysis and forecasting, socio-economic data research, needs assessments, fiscal studies, infrastructure inventory analysis, fee studies and feasibility studies.

Jan. 1990 – Jan. 1998
Local Government Land Planning - Wrote elements of the General Plan, zoning regulations and development standards; Wrote portions of EIR's and EIS's; managed and/ or prepare reports analyzing impacts from development projects and ensure compliance with CEQA and NEPA and the CA Map Act.

DECLARATION OF
Robert Fiore

I, Robert Fiore, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Protection Office of the Siting, Transmission and Environmental Protection Division as a Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Land Use** for the Henrietta Combined-Cycle Power Plant Conversion Amendment based on my independent analysis of the Petition for Amendment and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: October 28, 2009 Signed: Robert Fiore

At: Sacramento, California

Shahab Khoshmashrab
Mechanical Engineer

Experience Summary

Nine years experience in the Mechanical, Civil, Structural, and Manufacturing Engineering fields involving engineering and manufacturing of various mechanical components and building structures. This experience includes QA/QC, construction/licensing of electric generating power plants, analysis of noise pollution, and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Sacramento-- Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California

Professional Experience

2001-2009--Mechanical Engineer, Siting, Transmission & Environmental Protection– California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise and vibration, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

1998-2001--Structural Engineer – Rankin & Rankin

Engineered concrete foundations, structural steel and sheet metal of various building structures including energy related structures such as fuel islands. Performed energy analysis/calculations of such structures and produced structural engineering detail drawings.

1995-1998--Manufacturing Engineer – Carpenter Advanced Technologies

Managed manufacturing projects of various mechanical components used in high tech medical and engineering equipment. Directed fabrication and inspection of first articles. Wrote and implemented QA/QC procedures and occupational safety procedures. Conducted developmental research of the most advanced manufacturing machines and processes including writing of formal reports. Developed project cost analysis. Developed/improved manufacturing processes.

DECLARATION OF
SHAHAB KHOSHMASHRAB

I, **SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Facilities Siting Division as a **MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I participated in the preparation of the staff testimony on **NOISE AND VIBRATION**, for **Henrietta Peaker Plant** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 18, 2009 Signed: [signature]

At: Sacramento, California

Risk Science Associates

121 Paul Dr., Suite A, San Rafael, Ca. 94903-2047
415-479-7560 fax 415-479-7563
e-mail agreenberg@risksci.com

Name & Title: **Alvin J. Greenberg, Ph.D., FAIC, REA, QEP**
Principal Toxicologist

Dr. Greenberg has had over two decades of complete technical and administrative responsibility as a team leader in the preparation of human and ecological risk assessments, air quality assessments, hazardous materials handling and risk management/prevention, infrastructure vulnerability assessments, occupational safety and health, hazardous waste site characterization, interaction with regulatory agencies in obtaining permits, and conducting lead surveys and studies. He has particular expertise in the assessment of dioxins, lead, diesel exhaust, petroleum hydrocarbons, mercury, the intrusion of subsurface contaminants into indoor air, and the preparation and review of public health/public safety sections of EIRs/EISs. Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the US EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, the California Air Resources Board Advisory Committee on Diesel Emissions, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is the former Chair of the Bay Area Air Quality Management District Hearing Board, a former member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA. And, since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments, power plant security programs, and conducting safety and security audits of power plants for the California Energy Commission and has assisted the CEC in the assessment of safety and security issues for proposed LNG terminals. In addition to providing security expertise to the State of California, Dr. Greenberg was the Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Years Experience: 26

Education:

B.S.	1969	Chemistry, University of Illinois Urbana
Ph.D.	1976	Pharmaceutical/Medicinal Chemistry, University of California, San Francisco
Postdoctoral Fellowship	1976-1979	Pharmacology/Toxicology, University of California, San Francisco
Postgraduate Training	1980	Inhalation Toxicology, Lovelace Inhalation Toxicology Research Institute, Albuquerque, NM

Professional Registrations:

Board Certified as a Qualified Environmental Professional (QEP)
California Registered Environmental Assessor - I (REA)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

Society for Risk Analysis
Air and Waste Management Association
American Chemical Society
American Association for the Advancement of Science
National Fire Protection Association

Technical Boards and Committee Memberships - Present:

Squaw Valley Technical Review Committee
(appointed 1986)

Technical Boards and Committee Memberships - Past:

July 1996 – March 2002
Member, Bay Area Air Quality Management District Hearing Board
(Chairman 1999-2002)

September 2000 – February 2001
Member, State Water Resources Control Board Noncompliant Underground Tanks Advisory Group

January 1999 – June 2001
Member, California Air Resources Board Advisory Committee on Diesel Emissions

January 1994 - September 1999
Vice-Chairman, State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee

September 1998
Member, US EPA Workgroup on Cumulative Risk Assessment

April 1997 - September 1997
Member, Cal/EPA Private Site Manager Advisory Committee

January 1986 - July 1996
Member, Bay Area Air Quality Management District Advisory Council
(Chairman 1995-96)

January 1988 - June 1995
Member: California Department of Toxic Substance Control Site Mitigation Program Advisory Group

January 1989 - February 1995
Member: Department of Toxics Substances Control Review Committee, Cal-EPA

October 1991 - February 1992
Chair: Pollution Prevention and Waste Management Planning Task Force of the Department of Toxics Substances Control Review Committee, Cal-EPA

September 1990 - February 1991
Member: California Integrated Waste Management Board Sludge Advisory Committee

September 1987 - September 1988
ABAG Advisory Committee on Regional Hazardous Waste Management Plan

March 1987 - September 1987

California Department of Health Services Advisory Committee on County and Regional Hazardous Waste Management Plans

January 1984 - October 1987
Member, San Francisco Hazardous Materials Advisory Committee

March 1984 - March 1987
Member, Lawrence Hall of Science Toxic Substances and Hazardous Materials Education Project Advisory Board

Jan. 1, 1986 - June 1, 1986
Member, Solid Waste Advisory Committee, Governor's Task Force on Hazardous Waste

Jan. 1, 1983 - June 30, 1985
Member, Contra Costa County Hazardous Waste Task Force

Sept. 1, 1982 - Feb. 1, 1983
Member, Scientific Panel to Address Public Health Concerns of Delta Water Supplies, California Department of Water Resources

Present Position

January 1983- present
Owner and principal with Risk Sciences Associates, a Marin County, California, environmental consulting company specializing in multi-media human health and ecological risk assessment, air pathway analyses, hazardous materials management-infrastructure security, environmental site assessments, review and evaluation of EIRs/EISs, preparation of public health and safety sections of EIRs/EISs, and litigation support for toxic substance exposure cases.

Previous Positions

Jan. 2, 1983 - June 12, 1984
Member, State of California Occupational Safety and Health Standards Board (Cal/OSHA), appointed by the Governor

Aug. 1, 1979 - Jan. 2, 1983
Assistant Deputy Chief for Health, California Occupational Safety and Health Administration

Feb. 1, 1979 - Aug. 1, 1979
Administrative Assistant to Chairperson of Finance Committee, Board of Supervisors, San Francisco

Jan. 1, 1976 - Feb. 1, 1979
Research Pharmacologist and Postdoctoral Fellow, Department of Pharmacology and Toxicology, School of Medicine, University of California, San Francisco

Jan. 1, 1975 - Dec. 31, 1975
Acting Assistant Professor, Department of Pharmaceutical Chemistry, University of California, San Francisco

Experience

General

Dr. Greenberg has been a consultant in Hazardous Materials Management and Security, Human and Ecological Risk Assessment, Occupational Health, Toxicology, Hazardous Waste Site Characterization, and Toxic Substances Control Policy for over 26 years. He has broad experience in the identification, evaluation and control of health and environmental hazards due

to exposure to toxic substances. His experience includes Community Relations Support and Risk Communication through experience at high-profile sites and presentations at professional society meetings.

He has considerable experience in the review and evaluation of exposure via the air pathway - particularly to emissions from power plants, refineries, and diesel exhaust - and a thorough knowledge of the regulatory requirements through his experience at Cal/OSHA, the BAAQMD Hearing Board, as a consultant to the California Energy Commission, and in preparing such assessments for local government and industry. He has assessed exposures to diesel exhaust during construction and operations of stationary and mobile sources and has testified at evidentiary hearings numerous times on this subject.

He is presently assisting the California Energy Commission in assessing the risks to workers and the public of proposed power plants and LNG terminals in the state. His experience in hazard identification, exposure assessment, risk assessment, occupational safety and health, emergency response, and Critical Infrastructure Protection has made him a valuable part of the CEC team addressing this issue. He has reviewed and commented on the DEIS/DEIR for the proposed SES LNG Port of Long Beach terminal, focusing on security issues for the CEC and on safety matters for the City of Long Beach. He has presented technical information and analysis to the State of California Interagency LNG Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

He served for over five years as the Vice-chair of the California State Water Resources Control Board Advisory Committee convened to address toxic substances in sediments in bays, rivers, and estuaries. He has been a member of the Squaw Valley Technical Review Committee since 1986 establishing chemical application management plans at golf courses to protect surface and groundwater quality. He has also conducted numerous ecological risk assessments and characterizations, including those for marine and terrestrial habitats.

Dr. Greenberg has extensive experience in data collection and preparation of human and ecological risk assessments on numerous military bases and industrial sites with Cal/EPA DTSC and RWQCB oversight. He has also been retained to provide technical services to the Cal/EPA Department of Toxic Substances Control (preparation of human health risk assessments) and the Office of Environmental Health Hazard Assessment (review and evaluation of air toxics health risk assessments and preparation of profiles describing the acute and chronic toxicity of toxic air contaminants). He has also conducted several surveys of sites containing significant lead contamination from various sources including lead-based paint, evaluated potential occupational exposure to lead dust and fumes in industrial settings, prepared numerous human health risk assessments of lead exposure, and prepared safety and health plans for remedial investigation of lead contaminated soils. Dr. Greenberg is also a recognized expert on the requirements of California's Proposition 65 and has served as an expert on Prop. 65 litigation.

Sites with EPA, RWQCB and/or DTSC Oversight

Dr. Greenberg has specific experience in assessing human health and ecological risks at contaminated sites at the land/water interface, including petroleum contaminants, metals, mercury, and VOCs at several locations in California including Oxnard, Richmond, Avila Beach,

Mare Island Naval Shipyard, San Diego, Hollister, San Francisco, Hayward, Richmond, the Port of San Francisco, and numerous other locations. He has used Cal/EPA methods, US EPA methods, and ASTM Risk Based Corrective Action (RBCA) and Cal/Tox methodologies. He is extremely knowledgeable about SWRCB and SF Bay RWQCB regulations on underground storage tank sites and with ecological issues presented by contaminated sediments including sediment analysis, toxicity testing, tissue analysis, and sediment quality objectives. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Dr. Greenberg experience on many of these contaminated sites has been as a consultant to local governments, state agencies, and citizen groups. He assisted the City and County of San Francisco in developing local ordinance requiring soil testing (Article 20, Maher ordinance) and hazardous materials use reporting (Article 21, Walker ordinance). He served as the City of San Rafael's consultant to provide independent review and evaluation of the site characterization and remedial action plan prepared for a former coal gasification site. He was a consultant to a citizen group in northern California regarding exposure and risks due to accidental releases from a petroleum refinery and assisted in the assessment of risks due to crude petroleum contamination of a southern California beach. He has prepared a number of risk assessments addressing crude petroleum, diesel and gasoline contamination, including coordinating site investigations, environmental monitoring, and health risk assessment for the County of San Luis Obispo regarding Avila Beach subsurface petroleum contamination. That high-profile project lasted for over one year and Dr. Greenberg managed a team of experts with a budget of $750,000. Another high-profile project included the preparation of an extensive comprehensive human and ecological risk assessment for the Hawaii Office of Space Industry on rocket launch impacts and transportation/storage of rocket fuels at the southern end of the Big Island of Hawaii. Dr. Greenberg's risk assessments were part of the EIS for the project. Dr. Greenberg also worked on another high-profile project conducting Air Pathway Analysis of off-site and on-site impacts from landfill gas constituents, including indoor and outdoor air measurements, air dispersion modeling, flux chamber investigations, and health risk assessment for the County of Santa Barbara. Dr. Greenberg has conducted RI/FS work, prepared health risk assessments, evaluated hazardous waste sites and hazardous materials use at numerous locations in California, Hawaii, Oregon, Minnesota, Michigan, and New York. He has considerable experience in the development of clean-up standards and the development of quantitative risk assessments for site RI/FS work at CERCLA sites, as well as site closures, involving toxic substances and petroleum hydrocarbon wastes. He is experienced in working with both Region IX EPA and the State of California DTSC in negotiating clean-up standards based on the application of both site-specific and non site-specific health and ecological based clean-up criteria. He has significant experience in the development of site chemicals of concern list, quantitative data quality levels, site remedial design, the site closure process, the design and execution of data quality programs and verification of data quality prior to its use in the decision making process on large NPL sites.

Examples

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment, Ecological Screening Evaluation, and Development of Proposed Remediation Goals for the Flair Custom Cleaners Site, Chico, California (January 1996)

Human Health Risk Assessment for the X-3 Extrudate Project at Criterion Catalyst, Pittsburg, Ca. (November 1994)

Screening Health Risk Assessment and Development of Proposed Soil Remediation Levels at Hercules Plant #3, Culver City, Ca. (July 1993)

Ecological Screening Evaluation for the Altamont Landfill, Alameda County, Ca. (June, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawaii (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (March 1993)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca. (March, 1993)

Screening Health Risk Assessment for the Proposed Expansion of the West Marin Sanitary Landfill, Point Reyes Station, Ca. (March, 1993)

Health Risk Assessment for the Proposed Expansion of the Forward, Inc. Landfill, Stockton, Ca. (September 14, 1992)

Health Risk Assessment for the Rincon Point Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Health Risk Assessment for the South Beach Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Screening Health Risk Assessment and Development of Proposed Soil and Groundwater Remediation Levels, Kaiser Sand and Gravel, Mountain View, Ca. Prepared for Baseline Environmental Consulting (January 30, 1992)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Preliminary Health Risk Assessment for the City of Pittsburg Redevelopment Agency, Pittsburg, California (May 29, 1991)

Military Bases

Dr. Greenberg has experience in conducting assessments at DOD facilities, including RI/FS work, preparation of health risk assessments, evaluation of hazardous waste sites and hazardous materials use at the following Navy sites in California: San Diego Naval Base; Marine Corps Air-Ground Combat Center, 29 Palms; Mare Island Naval Shipyard, Vallejo; Treasure Island Naval Station, San Francisco, Hunters Point Naval Shipyard, San Francisco, and the Marine Corps Logistics Base, Barstow. He worked with the U.S. Navy and the U.S. EPA in the implementation of Data Quality Objectives (DQO's) at MCLB, Barstow.

Examples

Review and Evaluation of the Remedial Investigation Report and Human Health Risk Assessment for the U. S. Naval Station at Treasure Island, Ca. (June 1999)

Screening Health Risk Assessment for the Proposed San Francisco Police Department's Helicopter Landing Pad at Hunters Point Shipyard, San Francisco, Ca. (September 1997)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Health Risk Assessment for the Chrome Plating Facility, Mare Island Naval Shipyard, Vallejo, California (October 24, 1988)

Background Levels and Health Risk Assessment of Trace Metals present at the Naval Petroleum Reserve No.1, 27R Waste Disposal Trench Area, Lost Hills, California (August 12, 1988)

RCRA Facility Investigation (RFI) Work Plan of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 14, 1989)

Hazardous Waste and Solid Waste Audit and Management Plan, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (July 3, 1989)

Water Quality Solid Waste Assessment Test (SWAT) Proposal RCRA Landfill, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (October 31, 1988)

Waste Disposal Facilities, Waste Haulers, Waste Recycling Facilities Report, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 22, 1988)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Air Quality Solid Waste Assessment Test (SWAT) Proposal, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 25, 1988)

Liquefied Natural Gas (LNG)

Dr. Greenberg assisted the CEC in the preparation of the "background" report on the risks and hazards of siting LNG terminals in California ("LNG in California: History, Risks, and Siting" July 2003) and consulted for the City of Vallejo on a proposed LNG terminal and storage facility at the former Mare Island Naval Shipyard. He has also conducted an evaluation and prepared comments on the risks, hazards, and safety analysis of the DEIS/DEIR for the City of Long Beach on a proposed LNG terminal at the Port of Long Beach (POLB) and conducted an analysis on vulnerability and critical infrastructure security for the CEC on this same proposed LNG terminal. He currently advises the CEC on the POLB LNG proposal on risks, hazards, human thresholds of thermal exposure, vulnerability, security, and represented the CEC at a U.S. Coast Guard briefing on the Waterway Suitability Assessment that included the sharing of SSI (Sensitive Security Information). He has presented technical information and analysis to the State of California LNG Interagency Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

Infrastructure Security

Since 2002, Dr. Greenberg has been trained by and is working with the Israeli company SB Security, LTD, the most experienced and tested security planning and service company in the world. Since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments and power plant security programs for the California Energy Commission (CEC). In taking the lead for this state agency, Dr. Greenberg has interfaced with the California Terrorism Information Center (CATIC) and provided analysis, recommendations, and testimony at CEC evidentiary hearings regarding the security of power plants within the state. These analyses include the assessment of Critical Infrastructure Protection, threat assessments, criticality assessments, and the preparation of vulnerability assessments and off-site consequence analyses addressing the use, storage, and transportation of hazardous materials, recommendations for security to reduce the threat from foreign and domestic terrorist activities, perimeter security, site access by personnel and vendors, personnel background checks, management responsibilities for facility security, and employee training in security methods. Dr. Greenberg is the lead person in developing a model power plant security plan, vulnerability assessment matrix, and a security training manual for the CEC. The model security plan is used by power plants in California as guidance in developing and implementing security measures to reduce the vulnerability of California's energy infrastructure to terrorist attack. He has testified at several evidentiary hearings for the CEC on power plant security issues. He also leads an audit team conducting safety and security audits at power plants throughout California that are under the jurisdiction of the CEC. In addition to providing security expertise to the State of California, in August 2004, a team of experts led by Dr. Greenberg was awarded an 18-month contract by the State of Hawaii to update and improve the state's Energy Emergency Preparedness Plan and make recommendations for increased security of critical energy infrastructure on this isolated group of islands.

Air Pathway Analysis

Dr. Greenberg has prepared numerous Air Pathway Analyses and human health risk assessments, evaluating exposure at numerous locations in California, Hawai'i, Oregon, Minnesota, Michigan, and New York. He is experienced in working with Region IX EPA, the State of California DTSC, and the Hawai'i Department of Health Clean Air Branch in the application of both site-specific and non site-specific health risk assessment criteria.

Examples

Human Health Risk Assessment for the Open Burn/Open Detonation Operation at McCormick Selph, Inc., Hollister, Ca. (June 2003)

Air Quality and Human Health Risk Assessment for the Royal Oaks Industrial Complex, Monrovia, Ca. (January 2003)

Human Health Risk Assessment and Indoor Vapor Intrusion Assessment for the former Pt. St. George Fisheries Site, Santa Rosa, Ca. (October 2002)

Human Health Risk Assessment for the former Sargent Industries Site, Huntington Park, Ca. (July 2001)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca. (March, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawai'i (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (March 1993)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Cancer Risk Assessment for the H-Power Generating Station, Campbell Industrial Park, Oahu, Hawai'i (1988)

Hazardous Materials Assessments, Waste Management Assessments, Worker Safety and Fire Protection Assessments, and Public Health Impacts Assessments

Dr. Greenberg also has significant experience as a consultant and expert witness for the California Energy Commission providing analysis, recommendations, and testimony in the areas of hazardous materials management, process safety management, waste management, worker safety and fire protection, and public health impacts for proposed power plant/cogeneration facilities. These analyses include the evaluation and/or preparation of the following:

- Off-site consequence analyses of the handling, use, storage, and transportation of hazardous materials,
- Risk Management Plans (required by the Cal-ARP) and Business Plans (required by H&S Code section 25503.5),
- Safety Management Plans (required by 8 CCR section 5189),
- Natural gas pipeline safety,
- Solid and hazardous waste management plans,
- Phase I and II Environmental Site Assessments,
- Construction and Operations Worker Safety and Health Programs,
- Fire Prevention Programs,
- Human health risk assessment from stack emissions and from diesel engines, and
- Mitigation measures to address PM exposure, including diesel particulates

Examples

- Almond 2 Power Plant Project, City of Ceres, Ca. 2009 – present. Public health.
- Watson Cogeneration Steam and Electric Reliability Project, Carson, Ca. 2009 – present. Public health.
- Hanford Combined-Cycle Power Plant (amendment), Kings County, Ca. 2008 – present. Public health.
- Henrietta Combined-Cycle Power Plant (amendment), Kings County, Ca. 2008 – present. Public health.
- Lodi Energy Center, Lodi, Cal. 2008 – present. Hazardous materials management, worker safety/fire protection.
- Marsh Landing Generating Station, City of Antioch, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection.
- Palmdale Hybrid Power Plant, Palmdale, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- Stirling Energy Systems Solar 1 Project, San Bernardino County, Ca. 2008 – present. Public health.
- Stirling Energy Systems Solar 2 Project, Imperial County, Ca. 2008 – present. Public health.
- San Joaquin Solar 1&2, Fresno County, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- GWF Tracy Combined Cycle Power Plant, Tracy, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, public health.
- CPV Vaca Station Power Plant, Vacaville, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection.
- Willow Pass Generating Station, Pittsburg, Ca. 2008 – present. Hazardous materials management, worker safety/fire protection, waste management.
- Avenal Energy Power Plant, Avenal, Ca. 2008 – 2009. Worker safety/fire protection, public health.

- Orange Grove Energy, San Diego County, Ca. 2008-2009. Public health.
- Riverside Energy Resource Center Units 3&4, Riverside, Ca. 2008 – 2009. Hazardous materials management.
- Canyon Power Plant, Anaheim, Ca. 2007 – present. Hazardous materials management, worker safety/fire protection, public health.
- Carlsbad Energy Center, Carlsbad, Ca. 2007 – present. Hazardous materials management, worker safety/fire protection, public health.
- Ivanpath Solar Electric Generating System, San Bernardino County, Ca. 2007 – present. Public health.
- Kings River Conservation District Community Power Project, City of Parlier, Ca. 2007 – 2009. Hazardous materials management, worker safety/fire protection.
- Chula Vista Energy Upgrade Project, Chula Vista, Ca. 2007 – 2009. Hazardous materials management, worker safety/fire protection.
- Chevron Richmond Power Plant Replacement Project, Richmond, Ca. 2007 – 2008. Hazardous materials management, public health.
- Humboldt Bay Generating Station, Eureka, Ca. 2006 – 2008. Hazardous materials management, worker safety/fire protection, waste management.
- El Centro Power Plant – Unit 3 Repower Project, El Centro, Ca. 2006 – 2007. Public health.
- San Francisco Energy Reliability Project, San Francisco, Ca. 2004 – 2006. Hazardous materials management, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Malburg Generating Station Project, City of Vernon, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Blythe II, Blythe, Ca. 2002-3. hazardous materials, worker safety/fire protection,
- Palomar Energy Center, Escondido, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Project, Rancho Seco, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Project, Tesla, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- San Joaquin Valley Energy Center, San Joaquin, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management
- Morro Bay Power Plant, Morro Bay, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Potrero Power Plant Unit 7, San Francisco, Ca., 2001-2: hazardous materials, worker safety/fire protection
- El Segundo Power Redevelopment Project, El Segundo, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Rio Linda Power Project, Rio Linda, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Pastoria II Energy Facility Expansion, Grapevine, Ca., 2001: hazardous materials, worker safety/fire protection
- East Altamont Energy Center, Byron, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Magnolia Power Project, Burbank, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health

- Russell City Energy Center, Hayward, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Woodbridge Power Plant, Modesto, Ca., 2001: hazardous materials, worker safety/fire protection, waste management
- Colusa Power Plant Project, Colusa County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Valero Refinery Cogeneration Project, Benicia, Ca., 2001: hazardous materials, worker safety/fire protection
- Ocotillo Energy Project, Palm Springs, Ca., 2001: hazardous materials, worker safety/fire protection
- Gilroy Energy Center Phase II Project, Gilroy, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Los Esteros Critical Energy Facility, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Roseville Energy Facility, Roseville, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Spartan Power, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- South Star Cogeneration Project, Taft, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Plant, Eastern Alameda County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tracy Peaker Project, Tracy, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Henrietta Peaker Project, Kings County, Ca., 2001: hazardous materials, worker safety/fire protection, waste management, public health
- Central Valley Energy Center, San Joaquin, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Plant, Rancho Seco, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Los Banos Voltage Support Facility, Western Merced County, Ca., 2001-2: waste management, public health
- Palomar Energy Project, Escondido, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Metcalf Energy Center, San Jose, Ca., 2000-1: hazardous materials
- Blythe Power Plant, Blythe, Ca., 2000-1: hazardous materials
- San Francisco Energy Co. Cogeneration Project, San Francisco, Ca., 1994-5: hazardous materials
- Campbell Soup Cogeneration Project, Sacramento, Ca., 1994: hazardous materials
- Proctor and Gamble Cogeneration Project, Sacramento, Ca., 1993-4: hazardous materials
- San Diego Gas and Electric South Bay Project, Chula Vista, Ca., 1993: hazardous materials
- SEPCO Project, Rio Linda, Ca., 1993: hazardous materials
- Shell Martinez Manufacturing Complex Cogeneration Project, Martinez, Ca., 1993: hazardous materials and review and evaluation of EIR

Occupational Safety and Health/Health and Safety Plans/Indoor Air Quality

Dr. Greenberg has significant experience in occupational safety and health, having directed the development, adoption, and implementation of over 50 different Cal/OSHA regulations, including airborne contaminants (>450 substances), lead, asbestos, confined spaces, and worker-right-to-know (MSDSs). He has conducted numerous occupational health surveys and has extensive experience in the sampling and analysis of indoor air quality at residences, workplaces, and school classrooms. He is currently the team leader conducting safety and security audits at power plants throughout California for the California Energy Commission. Safety issues audited include compliance with regulations addressing several safety matters, including but not limited to, confined spaces, lockout/tagout, hazardous materials, and fire prevention/suppression equipment.

Examples

Review and Evaluation of Public and Worker Safety Issues at the proposed SES LNG Facility, Port of Long Beach. prepared for the City of Long Beach. (November 2005)

Confidential safety and security audit reports for 18 power plants in California. prepared for the California Energy Commission. (January 2005 through March 2006)

Report on the Accidental release and Worker Exposure to Anhydrous Ammonia at the BEP I Power Plant, Blythe, Ca. prepared for the California Energy Commission. (October 2004)

Investigation of a Worker Death in a Confined Space, La Paloma Power plant. prepared for the California Energy Commission. (July 2004)

Preliminary Report on Indoor Air Quality in Elementary School Portable Classrooms, Marin County, Ca. (December 1999)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Air Pathway Analysis for the Ballard Canyon Landfill. Submitted to the County of Santa Barbara, (March 1999)

Review and Evaluation of the Health Risk Assessment for Outdoor and Indoor Exposures at the Former Golden Eagle Refinery Site, Carson, Ca. (May 1998)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Determination of Occupational Lead Exposure at a Tire Shop in Placerville, Ca. (April 1993)

Development of an Environmental Code of Regulations for Hazardous Waste Treatment Facilities on La Posta Indian Tribal lands, San Diego County, Ca. (August 1992)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Mercury Contamination

Dr. Greenberg has prepared and/or reviewed several human health and ecological risk assessments regarding mercury contamination in soils, sediments, and indoor surfaces. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Examples

Review and evaluation of a human health risk assessment of ingestion of sport fish caught from San Diego Bay and which contain tissue levels of mercury and PCBs (November 2004 – present)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

DECLARATION OF
Alvin J. Greenberg, Ph.D.

I, **Alvin J. Greenberg, Ph.D.** declare as follows:

1. I am presently a consultant to the California Energy Commission, Energy Facilities Siting and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on the **Public Health** section for the **GWF Henrietta Expansion Project Amendment** based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 18, 2009 Signed: _____

At: Sacramento, California

HEDY KOCZWARA
Associate Environmental Scientist

ACADEMIC BACKGROUND
M.S., Earth Systems, Stanford University, 2001
B.S., Earth Systems, Stanford University, 2000

PROFESSIONAL EXPERIENCE

Ms. Koczwara is an environmental scientist with management and technical experience preparing Environmental Impact Reports and Statements in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Her project experience includes both linear and site-specific projects such as transmission lines, pipelines, power plants, and infrastructure development and improvement projects. She prepares technical analyses, coordinates with specialty subcontractors, and she provides management support in client interaction, public involvement, and supervises overall document coordination. She has performed the alternatives analysis for several power plant siting cases and controversial transmission line projects, which ultimately incorporated alternatives developed during the screening process into the approved project design.

Aspen Environmental Group — 2002 to present

- **California Energy Commission (CEC).** Under Aspen's CEC contract, Ms. Koczwara is an author and technical specialist in the environmental review of power plant applications. She researches and writes planning and siting reports, such as alternative analyses, in compliance with CEQA and NEPA. Each alternative site evaluation involves identifying potential locations that would meet most of the objectives stated by the applicant, but that could have less impact on the environment. Analyses have included the following proposed power plants and reports:
  - **Sentinel Power Plant (2007-ongoing).** Project manager, researcher, and writer of the Socioeconomic analysis for this proposed 850 MW power plant in unincorporated Riverside County near Desert Hot Springs.
  - **CEC Power Plant Siting Alternatives Analyses.** Ms. Koczwara has researched, updated, and written the alternatives analyses for the following 11 power plant siting projects: Palmdale Hybrid Power Plant; South Bay Replacement Project (SBRP); Avenal Energy Power Plant Project; San Francisco Electricity Reliability Project (SFERP); Blythe Energy Project, Phase Two; East Altamont Energy Center; El Segundo Power Redevelopment Project; El Segundo Cooling Options Report; Roseville Energy Facility Power Plant Project; SMUD Cosumnes Power Plant Project; and SMUD Cosumnes Cooling Options Report.
  - **Colusa Generating Station (CGS) Project (2007)**. Project manager, researcher, and writer of the Transmission System Engineering Assessment, which is attached as an appendix to the Staff Assessment and analyzes the indirect impacts of future reconductoring of the 8.75-mile Shasta-Flanagan-Keswick 230 kV transmission line and associated substation upgrades. The reconductoring project would be required as a result of the CGS project for the plant to operate at full capacity. The Final Staff Assessment was released on November 30, 2007.
  - **Chevron Richmond Power Plant Replacement Project (2007-2008).** Project manager, researcher, and writer of the Socioeconomic analysis for Chevron's proposed addition of 60 MW net generation to its existing Refinery electrical generation located within Chevron's Richmond Refinery in the City of Richmond in Contra Costa County. The Applicant withdrew its SPPE application in September 2008.

- **Blythe Energy Project Transmission Line Modifications (2004-2006).** Researched and wrote the alternatives analysis and coordinated on the level and scope of the alternatives analysis between the CEC (CEQA lead agency) and the two NEPA lead agencies, the Western Area Power Administration and U.S. Bureau of Land Management, was required for this joint Staff Assessment/Environmental Assessment. More than 23 alternatives were considered, and five transmission alternatives, plus the No Project Alternative/Action, were carried through for full evaluation.
- **WESTCARB Carbon Sequestration Demonstration Projects (2005-present).** Ms. Koczwara researched and wrote one CEQA Initial Study and three USDOE environmental documents for multi-site, multi-state pilot studies and preliminary investigations of methods for sequestering CO2 at terrestrial sites and in geologic formations for the Public Interest Energy Research (PIER) group at the CEC.
- **Comparative Study of Transmission Alternatives Background Report (2004).** Researched and wrote portions of the draft report, which presents background information related to transmission alternatives and the transmission planning process. The information in the report is being used to assess potential approaches to evaluation of non-transmission alternatives to transmission projects. Ms. Koczwara also attended the public workshop where the report was disseminated. The workshop was a forum for discussion regarding transmission alternatives methodology. Following the workshop, Ms. Koczwara prepared a summary of the workshop and comments received as an appendix to the final white paper report.
- **Hydroelectric Energy/Environment Report (2003).** Collected and logged data on over 200 hydroelectric power plants from FERC licenses. The final draft of the report was published in October 2003.
- **Coastal Study (2003).** Researched and wrote the alternative cooling technologies section for a statewide evaluation of California's 25 coastal power plants. The report was used to facilitate licensing of repower and replacement projects by providing better pre-filing guidance to developers, and minimizing data adequacy and other issues that could delay licensing.

- **Sunrise Powerlink Project EIS/EIR, California Public Utilities Commission (CPUC) and Bureau of Land Management (BLM).** Under contract to the CPUC, and under a Memorandum of Understanding with the Bureau of Land Management (BLM), Ms. Koczwara has provided management support, attended public meetings, and has written numerous EIR/EIS sections for a highly controversial 150-mile transmission line from Imperial County to coastal San Diego County. The 500 kV line would pass through Anza-Borrego Desert State Park, and a 230 kV line would continue through rural San Diego County with both overhead and underground segments. Ms. Koczwara researched and analyzed route segment alternatives for a comprehensive Alternatives Screening Report that screened over 100 alternatives, 27 of which were carried forward for full evaluation. Ms. Koczwara also wrote the Socioeconomics, Services, and Utilities section and the setting and impacts for Connected Actions, Future Transmission Expansion, Cumulative Impacts, among others. She managed the writing of the Environmental Justice analysis and was responsible for compiling and writing the Comparison of Alternatives, which identified the overall Environmentally Superior Alternative out of 27 route segments, options, transmission and system alternatives and non-wire alternatives. She also wrote the BLM Record of Decision and is assisting with implementation of the Mitigation Monitoring Compliance and Reporting Program.
- **CPUC When-Needed Environmental Services, CPUC.** Project Manager, Public Involvement Specialist, and/or technical writer for Socioeconomics, Public Utilities and Environmental Justice for Aspen's on-call contract for provision of CEQA services to the CPUC's Energy Division. Currently Project Manager for PG&E's Seventh Standard 115/21 kV Substation Project in Bakersfield.
- **Riverway Substation Project MND, CPUC (2007)**. As Deputy PM, Ms. Koczwara wrote the Project Description, website content, and assisted with all-around management support for this

substation project in Visalia. SCE proposed to built a 1.7-acre 66/12 kV low-profile substation and approximately 1,200 feet of underground 66 kV subtransmission lines.

- **Devers-Palo Verde No. 2 Transmission Line Project EIR/EIS, CPUC and BLM**. Ms. Koczwara served on the project management team and in this role she managed preparation of the 100-page Alternatives Screening Report, which evaluated and screened over 30 alternatives. She also prepared the Introduction, Alternatives, and part of the Executive Summary sections for the EIR/EIS. The EIR/EIS evaluated a proposed 280-mile 500 kV and 230 kV transmission line between the Palo Verde generating hub in Arizona and SCE's system in Riverside County.

- **Jefferson-Martin 230 kV Transmission Line Project EIR, CPUC**. Ms. Koczwara served as the assistant to the Project Manager on this major and controversial 27-mile transmission line through scenic San Mateo County in the Hwy 280 corridor, urban Colma and Daly City, and across San Bruno Mtn. This high profile project is an essential component of San Francisco's energy supply, and involved coordination with numerous local and regional jurisdictions, as well as the development of 38 alternatives including the No Project Alternative into a 200-page Alternatives Screening Report.

- **South San Joaquin Irrigation District's (SSJID) Acquisition of the Pacific Gas and Electric Company System, San Joaquin County.** On behalf of San Joaquin County, Aspen prepared an application and an EIR on SSJID's proposal to acquire specific electric distribution assets currently owned and operated by PG&E within southeastern San Joaquin County. Responsible for writing the Socioeconomics, Visual, Cultural Resources, Land Use, Public Services/Utilities, Agricultural Resources, and Recreation sections for the application and prepared the same sections for the EIR. The EIR was certified in June 2006.

- **Kirby Hills Natural Gas Storage Facility IS/MND, CPUC**. As Deputy Project Manager, Ms. Koczwara was responsible for the research and writing of the Aesthetics, Agricultural Resources, Population and Housing, Public Services, and Utilities and Service Systems sections of the IS/MND for the proposed use of a depleted gas reservoir in Solano County, for the temporary storage of natural gas by Lodi Gas. The project consists of the drilling of 10 injection/withdrawal wells, and the construction of 7 miles of pipeline and ancillary facilities. A CPCN was granted in March 2006.

PREVIOUS EXPERIENCE

Ms. Koczwara was a Facilities Coordinator at *Publicis and Hal Riney* from November 2001 to May 2002. She managed the daily office operations of a 14-department, 300-person advertising company and organized the scheduling, setup, and operation of client meetings and company events. She also has worked as a laboratory and fieldwork researcher at Stanford University (Palo Alto, California) and James Cook University (Townsville, Australia) from 1999 to 2001. Her work focused primarily on biological, ecological, and marine geochemical analyses.

TRAINING AND PROFESSIONAL ORGANIZATIONS

- 2006 Environmental Award for Los Angeles Unified School District's New School Construction Program EIR (certified in June 2004), American Planning Association (APA), Los Angeles Section
- 2004 AEP Outstanding Environmental Analysis Document, Jefferson-Martin Final EIR
- 2009 AEP Outstanding Environmental Analysis Document Merit Award, Sunrise Powerlink Project EIR/EIS
- *UC Davis Extension Courses Attended*: Planning in California: An Overview and Update; GIS for Resource Managers and Professionals; National Environmental Policy Act Overview and Refresher, Making Effective Use of Mitigated Negative Declarations, and California Environmental Quality Act Two-Day Workshop.

DECLARATION OF
Hedy Koczwara

I, **Hedy Koczwara** declare as follows:

1. I am presently employed by Aspen Environmental Group, consultant to the California Energy Commission's Facilities **Siting OFFICE** of the Systems Assessments and Facilities Siting Division as a **Staff Professional**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Socioeconomics** for the Henrietta Peaker Plant (01-AFC-18) Request to Amend License for Conversion to GWF Henrietta Combined-Cycle Power Plant based on my independent analysis of the Petition to Amend the project and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 17, 2009 Signed: _____

At: San Francisco, California

Mark Lindley, P.E.

Senior Associate

Mr. Lindley is a water resources engineer with experience in creek and wetland restoration design and construction, environmental impact/CEQA review, hydraulic design, surface and groundwater hydrology, field data collection, water quality, and remediation. His graduate studies focused on the application of analytical and numerical modeling techniques to hydraulic routing and sedimentation in wetlands, impoundments, detention basins and sediment control structures.

Mr. Lindley combines his expertise in technical analyses and engineering design with project management responsibilities to effectively address client needs. His technical work has included analysis and engineering design guidance in creek and wetland restoration projects, as well as hydraulic design guidance for flood control projects and environmental impact analysis for CEQA projects. Mr. Lindley also has significant experience in environmental site characterization and in the design, construction and operation of soil and groundwater remediation and treatment systems.

Mr. Lindley has provided developed construction documents including plans, specifications, and contract documents for creek and wetland restoration projects. He has provided construction management services for creek restoration projects including the implementation of grade control structures, toe protection, and biotechnical stream bank stabilization methods. He has also managed construction of wetland restoration projects including slough channel excavation, levee breaching and lowering, levee and wind wave berm construction, installation of culverts and hydraulic structures, and re-vegetation.

Additionally, Mr. Lindley has managed work efforts to collect data for physical characterization of project sites that include small and full-scale field studies for marsh and estuarine monitoring, stream monitoring, topographic and hydrographic surveying, and groundwater monitoring.

Education

M.S., 1994 — Biosystems & Agricultural Engineering, Oklahoma State University, Stillwater, OK

B.S., 1989 — Mechanical Engineering, University of Kentucky, Lexington, KY

Professional Registration

2004 Civil Engineer, California (License No. C 66701)

Awards

Phoenix Award for Outstanding Master's Student—First Runner-Up

Professional Affiliations

American Society of Agricultural Engineers

Selected Project Experience

Carrizo Energy Solar Farm Project, Environmental Impact Review. California Valley, California. Provided environmental review of a proposed solar thermal power plant in California Valley for the California Energy Commission. The environmental review was focused on the impacts of the proposed use of groundwater on the neighboring groundwater users. Other analyses included assessing potential flooding, erosion, and water quality impacts related to the plant's stormwater management plans.

Selected Project Experience
Continued

GWF Hanford Expansion Project, Environmental Impact Review. Hanford, California. Provided environmental review for the expansion of an existing single cycle natural gas fired power plant to a combined cycle plant for the California Energy Commission. The environmental review was focused on the feasibility of utilizing recycled water as an alternative water supply to the projects proposed us of groundwater meet State water policies. Other analyses included assessing potential flooding and water quality impacts related to the plant's stormwater management plans including a proposed infiltration basin.

GWF Henrietta Expansion Project, Environmental Impact Review. Kings County, California. Provided environmental review for the expansion of an existing single cycle natural gas fired power plant to a combined cycle plant for the California Energy Commission. The environmental review was focused on the feasibility of utilizing recycled water as an alternative to the Project's proposed use of Central Valley Project and State Water Project water to meet State water policies. Other analyses included assessing potential flooding and water quality impacts related to the plant's stormwater management plans including a proposed infiltration basin.

San Francisco Electric Reliability Project, Environmental Impact Review. San Francisco, California. Provided environmental review of a proposed power plant in San Francisco for the California Energy Commission. The environmental review was focused on the utilization of recycled wastewater from the City of San Francisco's combined sewer system and treated onsite for power plant evaporative cooling. In addition, the project site was located in a historic industrial area with existing subsurface impacts from previous land uses that required specific assessment and management to limit risks to onsite workers and neighboring businesses and residences. Other analyses included assessing potential flooding, erosion, and water quality impacts related to the plant's construction and operation.

Soil and Water Resource Compliance Reviews, Storm Water Pollution Prevention Plan review and implementation. Throughout California. Provided technical review of construction and operation Storm Water Pollution Prevention Plans (SWPPPs) for several power plants located throughout California on behalf of the California Energy Commission. Review of SWPPPs to determine if the SWPPPs met the requirements of Conditions of Certification specified in the Energy Commission's licensing decision and included sufficient detail and specified appropriate Best Management Practices (BMPs) to address potential erosion and water quality impacts. Site visits involved inspection of installed BMPs to verify that the measures included in the SWPPP were properly installed in preparation for the rainy season.

Blythe Energy Project - Phase II, Environmental Impact Review. Blythe, California. Provided environmental review of a proposed power plant in Blythe for the California Energy Commission. The environmental review was focused on the impacts of the proposed use of groundwater on the neighboring Colorado River. Other analyses included assessing potential flooding, erosion, and water quality impacts related to the plant's evaporation pond, retention basin, and storm water drainage channels.

University of California – Santa Cruz, Stormwater Improvement Projects. Santa Cruz County, California. Developed the design of stormwater management projects intended to increase infiltration and percolation of runoff from paved surfaces to address impacts of increased runoff on downstream creeks. Conducted analysis and design of detention facilities, bio-retention facilities, vegetated bio-swales, and infiltration channels. Managed the development of the designs from the conceptual level through final design and construction.

Selected Project Experience
Continued

Windemere Development, Surface Runoff Management. Contra Costa County, California. Conducted analysis and design of water quality treatment and flood control detention facilities for the Windemere Development. Developed a sediment management and monitoring plan for a wetland detention basin, collecting runoff from the Windemere Development.

Wendt Ranch Development, Surface Runoff Management. Contra Costa County, California. Conducted hydrologic and hydraulic analysis and design of water quality treatment and flood control detention facilities for the Wendt Ranch Development.

San Mateo Detention Basin. San Mateo County, California. Provided technical review for a multi-objective detention basin included in a Mixed Use Development that is intended to function as stormwater detention, water quality enhancement and fire water storage. Provided qualitative design input on the conceptual design approach, and comment on design aspects such as water quality volume calculation methodology, water quality treatment, outlet structure hydraulics, pond configuration, and potential opportunities for habitat enhancement.

Interstate 5 - Runoff Management Plan. Orange County, California. Developed a conceptual level runoff management plan for a proposed widening of the existing Interstate 5 highway in Orange County. The runoff management plan was intended to address flood control, water quality treatment, and hydrograph modification concerns associated with the highway. In addition, provided review of runoff management plans for an alternative toll road in Orange County.

Knightsen, Runoff Management Plan. Contra Costa County, California. Developed a conceptual runoff management plan utilizing treatment wetlands and bio-swales to treat runoff and agricultural wastewater while addressing local flooding issues.

Bahia Wetland Restoration Project – Planning, Design, and Construction. Novato, California. Managed the planning, permitting, design, and construction of an approximately 375-acre tidal and seasonal wetland restoration project for Marin Audubon Society. Planning services included development of preliminary designs and assistance with permitting with the Regional Water Quality Control Board, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, San Francisco Bay Conservation and Development Commission, and the local Planning Department. Design services included developing construction plans, specifications, and contract documents. Construction period services included construction management and engineering oversight.

Petaluma Marsh Restoration Project, Construction Management. Marin County, California. Provided construction management and observation services for the Petaluma Marsh Restoration Project, which entailed re-creation of a 102-acre tidal marsh on diked and subsided farmland. The restoration plan included excavation of tidal slough channels, breaching and lowering the existing perimeter levee, creation of wind-wave berms, construction of a significant new levee to protect and adjacent railroad easement, and revegetation.

Lincoln Creek Restoration, Creek Restoration Design. Auburn, California. Developed Creek Restoration design plans for day-lighting a 500-foot reach of Lincoln Creek within the Auburn School Park Preserve for the City of Auburn. Conducted hydraulic analyses and engineering design for the restored creek to determine design sections and rock sizes that met the client's aesthetic requirements for the park and engineering design/stability requirements. Developed design drawings from conceptual level through 100% construction plans.

Selected Project Experience
Continued

Hamilton Seasonal Wetland Design Guidelines, Wetland Design. Novato, California. Developed design guidelines for seasonal wetland at the Hamilton Airfield. Provided water balance and percolation analyses related of placement of dredged materials at pilot seasonal wetland sites.

Selected Project Experience
Continued
(Prior to PWA)

HP Valley Groundwater Treatment System, Construction Management, Monitoring, Operations. Santa Rosa, California. Managed the construction of a groundwater pump and treatment system to remediate groundwater impacted by volatile organic compounds for Hewlett Packard. Managed the post construction operation and maintenance of the system and groundwater monitoring including reporting to the Regional Water Quality Control Board.

HP Soil Vapor and Groundwater Treatment System, Construction Management, Monitoring, Operations. Palo Alto, California. Managed the construction of a groundwater pump and treatment system and soil vapor extraction system to remediate soil groundwater impacted by volatile organic compounds for Hewlett Packard. Managed the post construction operation and maintenance of the system and groundwater monitoring including reporting to the Regional Water Quality Control Board and Santa Clara Valley Water District.

Dual Phase Extraction and Treatment System, Construction Management, Monitoring, Operations. San Francisco, California. Managed the construction of a dual phase extraction and treatment system remediate soil and groundwater impacted by petroleum hydrocarbons. Managed the post construction operation and maintenance of the system and groundwater monitoring including reporting to the Regional Water Quality Control Board and San Francisco Department of Public Health.

DECLARATION OF
Mark Lindley, P.E.

I, **Mark Lindley** declare as follows:

1. I am presently employed as a consultant to the California Energy Commission in the **Environmental Office** of the **Siting, Transmission and Environmental Protection Division** as a **Senior Technical Specialist II/Project Manager**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Soil and Water Resources**, for the GWF Henrietta Combined Cycle Amendment to Amend-Application for Certification, based on my independent analysis of the Petition to Amend the project and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/29/2009 Signed: _____

At: San Francisco, California

SCOTT DEBAUCHE

Environmental Planner

ACADEMIC BACKGROUND

B.S., Urban & Regional Planning, University of Minnesota, 1994

PROFESSIONAL EXPERIENCE

Mr. Debauche is an environmental planner with 14 years of experience preparing a variety of federal and State of California environmental, planning, and analytical documents for large-scale infrastructure and development projects. Mr. Debauche brings the experience of specializing in the integration and completion of NEPA and CEQA documentation joint documentation evaluating Transportation/Traffic, Noise, Socioeconomics and Environmental Justice analysis, and public and community involvement programs.

Aspen Environmental Group — 2001 to present

California Energy Commission (CEC), Technical Assistance in Application for Certification Review. In response to California's power shortage, Aspen is assisting the California Energy Commission in evaluating the environmental and engineering aspects of new power plant applications throughout the State. As part of this effort, Mr. Debauche works as a technical specialist for Transportation/Traffic, Socioeconomics and Environmental Justice, and Alternatives analyses for the following power plant projects:

- **Carlsbad Energy Center Project, Carlsbad, CA.** Technical Specialist for both the Transportation/Traffic and Alternatives Staff Assessment for Carlsbad Energy Center, LLC's Application for Certification (AFC) to build the Carlsbad Energy Center Project (CECP), which will consist of a 558 MW gross combined-cycle generating facility configured using two units with one natural-gas-fired combustion turbine and one steam turbine per or unit. Issues of concern include major incompatibilities with local LORS, and cumulative impacts from widening of I-5.
- **GWF Tracy Combined Cycle Power Plant, San Joaquin County, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for GWF's proposal to modify the existing TPP, a nominal 169-megawatt (MW) simple-cycle power plant, by converting the facility into a combined-cycle power plant with a nominal 145 MW, net, of additional generating capacity.
- **GWF Henrietta Peaker Project, Kings County, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for GWF's proposal to modify the existing Henrietta Power Plant. New once-through steam generators (OTSGs) will be installed to allow the plant to be operated in its current simple-cycle configuration with no steam generation but with the selective catalytic reduction (SCR) and oxidation catalyst in operation, or to operate as a combined-cycle power plant generating an additional 25 MW of power with new proposed emission limits.
- **CPV Vaca Station Power Plant, Solano County, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for CPV Vacaville, LLC (CPVV) filed an Application for Certification (08-AFC-11) seeking authority to construct and operate the CPV Vaca Station (CPVV) project, a natural gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 660 megawatts (MW). The CPVV is proposed for a 24-acre site located at the intersection of Lewis and Fry roads in a rural area within the city limits of Vacaville, Solano County.

- **Kings River Conservation District Community Peaker Power Plant, Fresno County, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for the Kings Rivers Conservation District, who filed a Small Power Plant Exemption for the King River Conservation District Peaking Power Plant. The proposed 97-megawatt natural gas-fired plant will be located south of the City of Fresno and near the community of Malaga in Fresno County.
- **Lodi Energy Center, Lodi, CA.** Technical Specialist for the Socioeconomics Staff Assessment for a combined-cycle nominal 225-megawatt (MW) power generating facility.
- **Ivanpah Solar Electric Generating System Project, San Bernardino County, CA.** Technical Specialist for the Socioeconomics Staff Assessment/BLM EIS for a 400-megawatt solar thermal electric power generating system. The project's technology would include heliostat mirror fields focusing solar energy on power tower receivers producing steam for running turbine generators. Related facilities would include administrative buildings, transmission lines, a substation, gas lines, water lines, steam lines, and well water pumps. The proposed project would be developed entirely in the Mojave Desert region of San Bernardino County, California.
- **Canyon Power Plant, Anaheim, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a nominal 200 megawatt (MW) simple-cycle plant, using four natural gas-fired combustion turbines and associated infrastructure proposed by Southern California Public Power Authority (SCPPA). This project is a peaking power plant project located within the City of Anaheim, California.
- **Valero Cogeneration Project, Benicia, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a proposed cogeneration facility at the Valero Refinery in Benicia. Issues addressed included impacts on public services and other project-related population impacts such as school impact fees.
- **Rio Linda/Elverta Power Project, Sacramento, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a 560-megawatt natural gas power plant in the northern Sacramento County. Issues of importance included environmental justice and impacts on property values.
- **Magnolia Power Project, Burbank, CA.** Technical Specialist for the Socioeconomics Staff Assessments for this nominal 250-megawatt natural gas combined-cycle fired electrical generating facility to be located at the site of the existing City of Burbank power plant. Environmental justice issues and potential impacts on local economy and employment were evaluated.
- **Avenal Energy Project, Kings County, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a 600-megawatt combined cycle electrical generating facility, and associated linear facilities.
- **Inland Empire Energy Center, Riverside County, CA.** Technical Specialist for the Socioeconomics Staff Assessments for a 670-megawatt natural gas-fired, combined-cycle electric generating facility and associated linear facilities including, a new 18-inch, 4.7-mile pipeline for the disposal of non-reclaimable wastewater, and a new 20-inch natural gas pipeline. The project would be located on approximately 46-acres near Romoland, within Riverside County.
- **Coastal Plant Study.** Technical Specialist for the Socioeconomics Staff Assessments for a possible modernization, re-tooling, or expansion of California's 25 coastal power plants including the Encina Power Plant and the San Onofre Nuclear Power Plant.

California Public Utilities Commission (CPUC). Under Aspen's environmental services contract with the CPUC, Mr. Debauche has prepared environmental analysis sections of environmental reports analyzing large-scale infrastructure projects. His project experience with the CPUC includes the following:

- **Tehachapi Renewable Transmission Project (TRTP) EIR/EIS, Kern, Los Angeles, and San Bernardino Counties, CA.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Mr. Debauche is currently serving as the Technical Specialist for Noise and Alternatives evaluation for SCE's proposal to construct, use, and maintain a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County. Approximately 46 miles of the project would be located in a 200- to 400-foot right-of-way on National Forest System land (managed by the Angeles National Forest) and approximately three miles would require expanded right-of-way within the Angeles National Forest. The proposed transmission system upgrades of TRTP are separated into eight distinct segments: Segments 4 through 11. Segments 1

(Antelope-Pardee) and Segments 2 and 3 (Antelope Transmission Project) were evaluated in separate CEQA and NEPA documents as described below.

- **Devers–Palo Verde 500 kV Transmission Line Project EIS/EIR, southern California/western Arizona.** For this EIR/EIS prepared by U.S. Bureau of Land Management and CPUC, Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for SCE's proposed 250-mile transmission line project from the Palo Verde Nuclear power plant in Arizona to the northern Palm Springs area in California. Major issues of concern include EMF and visual impacts on property values, impacts on the area's vast recreational resources and tribal lands, and the development and evaluation of several route alternatives, including the Devers-Valley No. 2 Route Alternative, which eventually was approved by the CPUC.
- **Antelope-Pardee 500 kV Transmission Line Project EIS/EIR, Los Angeles County, CA.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for SCE's proposed 25-mile transmission line project from the Antelope Substation in the City of Lancaster, through the ANF, and terminating at SCE's Pardee Substation in Santa Clarita. Major issues of concern included impacts to biological, recreational, and cultural resources within Forest lands, EMF and visual impacts on property values, impacts on residences in the urbanized southern regions of the route, and the development and evaluation of several route alternatives.
- **MARS EIR/EIS, Monterey, CA.** Mr. Debauche served as the technical specialist in charge of preparing the Environmental Justice analysis for this EIR/EIS, which would evaluate the effects associated with the installation and operation of the proposed Monterey Accelerated Research System (MARS) Cabled Observatory Project (Project) proposed by Monterey Bay Aquarium Research Institute (MBARI)[NEPA Lead Agency]. The goal of the Project was to install and operate, in State and Federal waters, an advanced cabled observatory in Monterey Bay that would provide a continuous monitoring presence in the Monterey Bay National Marine Sanctuary (MBNMS) as well as serve as the test bed for a state-of-the-art regional ocean observatory, currently one component of the National Science Foundation (NSF) Ocean Observatories Initiative (OOI). The Project would provide real-time communication and continuous power to suites of scientific instruments enabling monitoring of biologically sensitive benthic sites and allowing scientific experiments to be performed. The environmental justice analysis evaluated the potential for any disproportionate project impacts to both land-based populations and fisheries workers. The CEQA Lead Agency was CSLC.
- **El Casco System Project EIR, Riverside, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for this EIR prepared for the CPUC to evaluate SCE's application for a Permit to Construct (PTC) the El Casco System Project. The Proposed Project would be located in a rapidly growing area of northern Riverside County, which includes the Cities of Beaumont, Banning, and Calimesa. A 115 kV subtransmission line begins at Banning Substation and extends westward toward the proposed El Casco Substation site within the existing Banning to Maraschino 115 kV subtransmission line and Maraschino–El Casco 115 kV subtransmission line ROWs. Major issues of concern include impacts to existing and residential land uses, which have led to the development of a partial underground alternative and a route alternative different than the project route proposed by SCE (the Applicant). The 1,200-page Draft EIR was released for a 45-day public review and comment on December 12, 2007, and evaluates project alternatives at the same level of detail as the Proposed Project analysis.
- **Antelope Transmission Project, Segments 2 & 3 EIR, Los Angeles and Kern Counties, CA.** For this EIR being prepared by the CPUC, Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation. The proposed Project includes both Segment 2 and Segment 3 of the Antelope Transmission Project, and involves construction of new transmission line infrastructure from the Tehachapi Wind Resource Area in southern Kern County, California, to SCE's existing Vincent Substation in Los Angeles County, California. The Tehachapi Wind Resource Area is one of the State's greatest potential sources for the generation of wind energy. A variety of wind energy projects are currently in development for this region. Major issues of concern include EMF and visual impacts on property values, impacts on residences and agricultural resources, and the development and evaluation of several substation and route alternatives.

- **Diablo Canyon Power Plant (DCPP) Steam Generator Replacement Project EIR, San Luis Obispo County, CA.** Mr. Debauche served as the Technical Specialist for Socioeconomics and Alternatives evaluation of this EIR. The EIR addressed impacts associated with the replacement of the eight original steam generators (OSGs) at DCPP Units 1 and 2 due to degradation from stress and corrosion cracking, and other maintenance difficulties. The Proposed Project would be located at the DCPP facility, which occupies 760 acres within PG&E's 12,000-acre owner-controlled land on the California coast in central San Luis Obispo County.
- **SDG&E Miguel Mission Substation Draft EIR.** The major part of the Proposed Project would include the installation of a new, bundled 230 kV circuit between Miguel and Mission Substations, which would be located entirely within SDG&E's existing 35-mile ROW. Mr. Debauche prepared social science analysis for the Initial Study, as well as the Draft EIR Project Description and several key environmental sections.
- **PG&E's Proposed Divestiture of Hydroelectric Assets Project EIR.** Mr. Debauche prepared several key sections of the Draft EIR, including Socioeconomics and Hazardous Materials analysis.
- **Viejo System Project IS/MND, Orange County, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for the project's CEQA documentation, including and Initial Study, prepared on behalf of the CPUC to evaluate Southern California Edison's (SCE) Application for a Permit to Construct the Viejo System Project, which was in SCE's forecasted demand of electricity and goal of providing reliable electric service in southern Orange County. The Viejo System Project would serve Lake Forest, Mission Viejo, and the surrounding areas. Components of the project included, construction of the new 220/66/12 kilovolt (kV) Viejo Substation, installation of a new 66 kV subtransmission line within an existing SCE right-of-way, replacement of 19 double-circuit tubular steel poles with 13 H-frames structures, and minor modification to other transmission lines. Major issues of concern include visual impacts of transmission towers, EMF effects, and project impacts on property values.
- **Looking Glass Networks Fiber Optic Cable Project IS/MND, northern and southern California.** As part of Aspen's ongoing contract with the CPUC for review of Telecommunications projects, this document encompasses and evaluation of project impacts and network upgrades in the San Francisco Bay Area and the Los Angeles Basin Area. Prepared the socioeconomic analysis for this comprehensive CEQA document reviewing the potential impacts of hundreds of miles of newly proposed fiber optic lines throughout northern and southern California, including Los Angeles and Orange Counties.

Recent Aspen projects include a number of large-scale infrastructure projects. Mr. Debauche recent project experience on these projects includes the following:

- **TANC Transmission Project (TTP) EIR/EIS, several Northern California Counties.** Mr. Debauche is currently serving as the Technical Specialist in charge of preparation of the EIR/EIS Transportation/Traffic and Socioeconomics CEQA/NEPA analysis. The Transmission Agency of Northern California (TANC) and Western Area Power Administration (Western), an agency of the U.S. Department of Energy (DOE), are the CEQA lead agency and NEPA lead agency, respectively. The TTP generally would consist of new and upgraded 500 kilovolt (kV) and 230 kV transmission lines, substations, and related facilities generally extending from northeastern California near Ravendale in Lassen County to the California Central Valley through Sacramento and Contra Costa Counties and westward into the San Francisco Bay Area.
- **Littlerock Reservoir Sediment Removal Project EIS/EIR, Palmdale, CA.** Mr. Debauche is the Technical Specialist for Transportation/Traffic, Noise, and Socioeconomics for this joint EIS/EIR evaluating the impacts of sediment removal alternatives for the Littlerock Reservoir and Dam on USFS Angeles National Forest (NEPA Lead Agency) lands in Los Angeles County. The project involves impacts to the arroyo toad, extensive coordination with USFWS for a Section 7 consultation, incorporation of new Forest Service Plan updates and requirements into the analysis, preparation of the Forest Service required BE/BA, and analysis of compliance with federal conformity requirements. Aspen is currently working on the Administrative Draft EIR/EIS and assisting the PWD with portions of their Proposition 50 grant application to the DWR.

- **Alta Wind Project EIR, Kern County, CA.** Mr. Debauche is the Technical Specialist for Transportation/Traffic, Noise, and Air Quality for this EIR. The applicant, Alta Windpower Development, LLC, proposes to develop the Alta-Oak Creek Mojave Project (proposed project or project) for the commercial production of up to 800 Megawatts (MW) of electricity from wind turbines. The proposed project would result in construction of up to 350 wind turbine generators, their ancillary facilities and supporting infrastructure located on three distinct land areas comprising a total of approximately 10,750 acres located approximately 3 miles west of State Route (SR) 14 (Antelope Valley Freeway) and 3 miles south of SR-58 in the Willow Springs area of eastern Kern County.

- **Baldwin Hills Oil Field Community Standards District EIR Review and Ordinance Preparation, Culver City, CA.** Mr. Debauche served as the Technical Specialist for the City of Culver City reviewing the Los Angeles County Baldwin Hills Oils Field Community Standards District EIR Noise analysis evaluating the impacts of expanding the existing Baldwin Hills oil field. Once completed, Mr. Debauche then prepared the Noise section of the newly enacted City of Culver City Community Standards District overlay zone restricting noise generation by the Baldwin Hills Oil Field on the residents of Culver City.
- **Long Beach LNG Import Project, Long Beach, CA.** Under contract to the City of Long Beach, Aspen was tasked to review the Draft EIS/EIR for the proposed construction and operation of this onshore LNG facility to be located at the Port of Long Beach. Mr. Debauche reviewed the document for technical adequacy and assisted the City in preparing written comments for the following sections of the EIS/EIR: Transportation/Traffic and Noise.
- **Sunset Substation and Transmission and Distribution Project CEQA Documentation, Banning, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for this EIR. The City of Banning proposes to construct the Sunset Substation and supporting 33-kilovolt (kV) transmission line that would interconnect with the City's existing distribution system. The purpose of this new substation and transmission is to relieve the existing overloads that are occurring within the City's electric system and to accommodate projected growth in the City.

Los Angeles Department of Water and Power (LADWP). Responsible for conducting the analyses of the technical and social science issue areas for a variety of EISs and EAs as part of two environmental services contracts. Delivery orders have included:

- **River Supply Conduit (RSC) Upper Reach Project EIR, Los Angeles and Burbank, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for the CEQA document for this project. The RSC is a major transmission pipeline in the LADWP water distribution system. The existing RSC pipeline's purpose is to transport large amounts of water from the Los Angeles Reservoir Complex and local ground water wells to reservoirs and distribution facilities located in the central areas within of the City of Los Angeles. The LADWP proposed a new larger RSC pipeline to replace and realign the Upper and Lower Reaches of the existing RSC pipeline, which would involve the construction of approximately 69,600 linear feet (about 13.2 miles) of 42-, 48-, 60-, 66-, 72-, 84-, and 96-inch diameter welded steel underground pipeline.
- **Mulholland Pumping Station and Lower Hollywood Reservoir Outlet Chlorination Station Project IS/MND, Los Angeles, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for preparation of CEQA documentation for this project. LADWP proposed to replace the existing historic pumping/chlorination station building as well as the existing lavatory and unoccupied Water Quality Laboratory buildings with a new single structure pumping/chlorination station within the LADWP's Hollywood Reservoir Complex located in the Hollywood Hills section of the City Los Angeles. These improvements were required due to the age and deterioration of the facility and the potential risk of seismic damage to existing structures. An Initial Study was prepared in support of a City of Los Angeles General Exemption.

- **Taylor Yard Water Recycling Project (TYWRP) IS/MND, Los Angeles and Glendale, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for preparation of CEQA documentation for this project. LADWP proposed to construct the TYWRP in order to provide recycled water produced by the Los Angeles–Glendale Water Reclamation Plant (LAGWRP) to the Taylor Yard. An important part of the City of Los Angeles' expanding emphasis on water conservation is the concept that water is a resource that can be used more than once. Because all uses of water do not require the same quality of supply, the City has been developing programs to use recycled water for suitable landscaping and industrial uses. The project is located in the southernmost part of the City of Glendale and northeastern part of the City of Los Angeles. The IS/MND was adopted in the Summer of 2007.
- **DC Electrode Project IS/MND, Los Angeles, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for preparation of CEQA documentation for this project. LADWP proposed to construct a new electrode distribution line from West Los Angeles to the Pacific Ocean stopping point in Malibu, CA up the Pacific Coast Highway.
- **District Cooling Plant Project, Los Angeles IS/MND, CA.** Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for preparation of CEQA documentation for this project. LADWP proposed to construct a District Cooling Plant and Distribution System (proposed project) in order to provide a centralized system for producing chilled water for use by area users, which are generally large commercial, governmental, industrial and institutional buildings who generate their own chilled water utilizing individual chiller plants for space cooling and air-conditioning.

U.S. Army Corps of Engineers, Los Angeles District. Responsible for conducting the analyses of the social science issue areas for a variety of EISs and EAs as part of two environmental services contracts. Delivery orders have included:

- **Northeast Phoenix Drainage Area Alternatives Analysis Report, Phoenix and Scottsdale, AZ.** Worked with preparation of an alternatives analysis report that evaluated the potential environmental impacts associated with channel and detention basin alternatives to control flooding problems resulting from fast rate of development in the northeast Phoenix area.
- **Murrieta Creek Flood Control and Environmental Restoration Project**. Mr. Debauche served as a technical writer of an Environmental Assessment and Mitigation Monitoring plan for Phase 1 of a flood control and restoration project in Riverside County.

California Department of Water Resources. Responsible for conducting the environmental analyses for CEQA compliance as part of two environmental services contracts. Delivery orders have included:

- **Piru Creek Stabilization and Restoration Project.** The California Department of Water Resources (CDWR) proposes to repair erosion damage at a series of three locations downstream of Pyramid Dam and seismically retrofit the Pyramid Dam access bridge that crosses Piru Creek. Mr Debauche served as technical writer of the Initial Study for this project.

Los Angeles Unified School District (LAUSD), Los Angeles County, CA. Deputy Program manager and Technical writer for several CEQA documents (EIRs and IS/MNDs) being prepared as part of Aspen's ongoing services contract with the LAUSD to help approve school projects that would meet existing overcrowded conditions in the greater Los Angeles area. Projects have included:

- **New School Construction Program EIR.** Serves as a technical writer for social science issues, including socioeconomics, and population and housing for this Program EIR being prepared for the LAUSD. The LAUSD 2020 Program would provide student seats throughout the LAUSD via a combination of the addition of portable classrooms to existing campuses, modernization and reconfiguration of existing campuses, and the construction of new schools. Mr. Debauche prepared the Noise, Socioeconomic, and Alternative Evaluation of this EIR.
- **East Valley Middle School No. 2 EIR.** Served as a key technical writer for this middle school project proposed to be located at the previous Van Nuys Drive-In site. The EIR focused on impacts associated with air quality, hazards and hazardous materials, noise, land use and planning, and traffic and transportation.

Major issues of concern included traffic and noise generated by school operation activities. The EIR included LAUSD design standards and measures employed to minimize environmental impacts.

- **Mt. Washington Elementary School Multi-Purpose Room Addition Project IS/MND.** Served as Deputy Program Manager for this project proposed the development of a multi-purpose room facility, including a library, auditorium, and theater, to the existing Mt. Washington Elementary School campus located in Los Angeles. The surrounding residential community had concerns regarding the proposed project's impacts on aesthetics, traffic, air quality, and noise. Of particular concern, was impacts generated due to the after-hours use of the multi-purpose room facility by civic and community groups.
- **Canoga Park New Elementary School IS/MND.** Served as technical writer for this elementary school project proposed to be developed on a parcel of land owned by the non-profit organization, New Economics For Women (NEW). This "turn-key" project consisted of a Charter Elementary School to be developed by NEW and sold to the LAUSD for operation. It was later decided that NEW would lease the school back and run it as a charter school. Issues of concern included, pedestrian safety, traffic, air quality, noise, and land use.
- **Hughes Magnet Span School IS/MND.** Served as a technical writer for socioeconomics, hydrology, public services and utilities, and recreational impacts for the proposed re-opening of the existing Hughes Middle School as a Magnet Span School serving up to 1,620 District 6th though 12th grade students. The re-opening of the Hughes Middle School would require the relocation of the existing uses of the campus. The existing Enadia Way Elementary School and Platt Ranch Elementary School would be re-opened for the relocation of these uses.
- **Wonderland Elementary School Portable Classroom Additions IS/MND.** Served as the technical writer of an IS/MND for a proposed addition to the Wonderland Avenue Elementary School, located in the City of Los Angeles. Ms. Walker is responsible for overall coordination and scheduling of the project's environmental review, communications with the LAUSD, senior technical review of all documents produced, presentation during the project's public scoping meetings and hearings, and assurance of public noticing. Served as technical writer of the IS/MND.
- **Pio Pico Elementary School Playground Expansion IS/MND**. Completed a Notice of Preparation, Initial Study, and Administrative Draft EIR for the expansion of a playground at the existing Pio Pico School in the LAUSD. The playground was proposed on five residential properties. One of the residences is a potentially significant historical resource because of its association with an African-American woman journalist, Fay M. Jackson. This project was cancelled by the LAUSD after completion of the administrative draft report. Served as technical writer of the IS/MND.
- **Fairfax Senior High School Portable Classroom Addition IS/MND**. Served as technical writer of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.
- **Polytechnic Senior High School Portable Classroom Addition IS/MND**. Served as technical writer of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.
- **Washington Senior High School Portable Classroom Addition IS/MND**. Served as technical writer of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.

EIP Associates 1998 to 2001

MTA Mid Cities/Westside Transit Corridor Study EIS/EIR. Was a key writer of the EIS/EIR for this 3-phase (including prepared the Major Investment Study (MIS), the Environmental Impact Statement (EIS), and an evaluation of the urban design implications of transit interventions on selected routes) study intended to address current and long range traffic congestion in the central and westside areas of the Los Angeles Basin. Three east/west corridors and a range of transit alternatives ranging including Rapid Bus, light rail, and heavy rail are being evaluated. In addition to preparing several issue area chapters of this comprehensive joint EIS/EIR, Mr. Debauche assisted with the Environmental Justice Analysis (per

Executive Order 12898), the Section 4(f) Parklands discussion, and the land use and socioeconomics sections of the EIS/EIR.

Wes Thompson Ranch Development Project EIR. Served as project writer for this hillside residential development in the City of Santa Clarita. Issues of concern included seismic and air quality impacts associated with the excavation of 2 million cubic yards of soil, the project's non-compliance with the City's hillside ordinance for innovative design, and traffic generated by project-related population growth in the area. Four different site configuration alternatives were developed as part of the EIR analysis. Other issues of concern included sensitive biological resources, the potential for hydrological impacts due to disturbance of the hillside, and cultural resources. As the technical writer for socioeconomics, noise, hazardous materials, air quality, and public services, Mr. Debauche conducted analysis and prepared these environmental sections as well as the project description, alternatives screening and development, traffic assistance, and cumulative scenario for:

City of Santa Monica Environmental Assessments. Was key writer of several environmental assessment documents for housing, commercial, institutional, and mixed-use developments in compliance with CEQA. As the technical writer for socioeconomics, noise, hazardous materials, air quality, and public services, Mr. Debauche conducted analysis and prepared these environmental sections as well as the project description, alternatives screening and development, traffic assistance, and cumulative scenario for:

- **Seaview Court Condominiums IS/MND.** This comprehensive Initial Study/Mitigated Negative Declaration included six technical reports including traffic, cultural resources, parking survey, shade and shadow analysis, and a geotechnical assessment to evaluate the level of severity of this development in the waterfront area of Santa Monica. Major issues of concern were; parking and project-generated traffic on adjacent narrow residential streets; visual obstruction and shading impacts of the proposed structure; liquefaction and seismic impacts to adjacent properties as result of the projsect's excavation for a subterranean parking garage; and the potential impacts of the project to impact the integrity of a historic district and the historic Seaview Walkway to the beachfront.
- **Four-Story Hotel IS/MND.** A comprehensive Initial Study/Mitigated Negative Declaration was prepared for this four-story hotel adjacent to St. John's Hospital in Santa Monica. Major issues of concern included project-generated traffic on surrounding multi-family residential uses and emergency access to the hospital.
- **Santa Monica College Parking Structure B Replacement EIR.** This focused EIR addressed issues related to traffic and neighborhood land use impacts associated with the addition of a 3-story parking structure in the center of the SMC campus. Major issues of concern included the potential for project-generated traffic to cause congestion at the school's main entrance on Pico Boulevard, and the potential for overflow traffic to impact the Sunset Community of single-family homes adjacent to the school.
- **North Main St. Mixed-Use Development Project EIR**. This EIR included evaluation of impacts resulting from the development of a mixed-use development in Santa Monica's "Commercial Corridor" on Main Street, with ground-floor residences and boutique commercial uses. Major issues of concern included traffic and parking impacts to Main Street and surrounding residential land uses, shade and shadow impacts, and neighborhood impacts.

Specific Plans and Redevelopment Projects. As the technical writer for socioeconomics, noise, hazardous materials, air quality, and public services, Mr. Debauche conducted analysis and prepared these environmental sections as well as the project description, alternatives screening and development, traffic assistance, and cumulative scenario for:

- **Cabrillo Plaza Specific Plan EIR in Santa Barbara.** This project consisted a mixed-use commercial development on Santa Barbara's waterfront on Cabrillo Boulevard. On-site uses included an aquarium, specialty retail, restaurants, and office space.
- **Culver City Redevelopment Plan and Merger EIR.** This programmatic EIR evaluated the impacts of the City's redevelopment of its redevelopment zones. A major land use survey and calculation of acreage of redevelopment lands was conducted as part of the EIR.

- **Dana Point Headlands Specific Plan EIR.** This EIR evaluated the development of coastal bluff in the City with hotel, single- and multi-family residential, and commercial uses. Major issues of concern included ground disturbance as a result of excavation, impacts to terrestrial and wildlife biology, recreation impacts to beachgoers, and project-generate population inducement.
- **Triangle Gateway Redevelopment Project EIR in Beverly Hills, CA.** This EIR evaluated the development of a supermarket, retail shops, and office space in the triangle gateway portion of downtown Beverly Hills. Issues of concern evaluated by Mr. Debauche included traffic, land use, and impacts to on-site historic structures.
- **UCLA Campus Housing Expansion.** This EIR evaluated the development and expansion of campus housing within the UCLA campus. Issues of concern evaluated by Mr. Debauche included hazardous materials and population/housing.

CH2M Hill - Minneapolis, MN **1995 to 1998**

- **Minneapolis/St. Paul International Airport Expansion EIS:** Mr. Debauche was a key writer of the EIS for this $4 million technical and environmental study, including the preparation of an Environmental Impact Statement (EIS), and an evaluation of the urban design implications of a proposed $800 million expansion of the existing MSP International airport, including transit and terminal modifications and the inclusion of a new perpendicular runaway. The studies included alternatives to the project and the long-term effects on the cities of Minneapolis and St. Paul. In addition to preparing several issue area chapters of this comprehensive EIS, Mr. Debauche assisted with the Environmental Justice Analysis (per Executive Order 12898), the Section 4(f) Parklands discussion, and the socioeconomics sections of the EIS. In addition, Mr. Debauche assisted with preparation of a technical report on airport noise effects on nearby housing and mitigation programs for the impacts of the proposed runway.
- **Minneapolis/St. Paul Wastewater Treatment Facility Expansion EIS:** Was a key writer of the EIS for expansion of the existing wastewater treatment facility serving the twin cities area. The studies included alternatives to the project and the long-term effects on the cities of Minneapolis and St. Paul. Mr. Debauche prepared several issue area chapters of this comprehensive EIS, including the Environmental Justice Analysis (per Executive Order 12898), and the socioeconomics sections of the EIS.

PROFESSIONAL ASSOCIATIONS

- American Planning Association (APA), Chapter Member

DECLARATION OF
Testimony of Scott Debauche

I, **Scott Debauch,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as a **Transportation and Traffic Technical Specialist**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transportation and Traffic** for the **Henrietta Combined Cycle Power Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 17, 2009 Signed: _____

At: Agoura Hills, California

DR. OBED ODOEMELAM

EDUCATION:

1979-1982 University of California, Davis, California. Ph.D., Ecotoxicology

1976-1978 University of Wisconsin, Eau Claire, Wisconsin. M.S., Biology.

1972-1976 University of Wisconsin, Eau Claire, Wisconsin. B.S., Biology

EXPERIENCE:

1987-
The Present: California Energy Commission: Staff Toxicologist.

Responsible for the technical guidance of staffs from all Divisions in the Commission as well as outside consultants or University researchers who manage or conduct multi-disciplinary research in support of Commission programs. Research is in the following program areas: Energy conservation-related indoor pollution, power plant-related outdoor pollution, power plant-related waste management, alternative fuels-related health effects, waste water treatment, and the health effects of electric and magnetic fields. Serve as scientific adviser to Commissioners and Commission staff on issues related to energy conservation. Serve on statewide advisory panels and working groups on issues related to multiple chemical sensitivity, building ventilation standards, electric and magnetic field regulation, health risk assessment, and outdoor pollution control technology. Testify as an expert witness at Commission hearings and before the California legislature on health issues related to energy development, utilization, and conservation. Testimonies are usually on public health, air quality, waste management, ventilation standards, and transmission line safety and nuisance and are prepared using specific assessment guidelines I helped develop for statewide use. Review research proposals and findings for policy implications, interact with federal and state agencies and industry on the establishment of exposure limits for environmental pollutants, serve on research statewide assessment committees, and prepare scientific reports for publication.

1985-1989 California Energy Commission: Health and Safety Specialist I.

Responsible for assessing the potential impacts of criteria and non-criteria pollutants and hazardous wastes associated with the construction, operation and decommissioning of specific power plant projects. Testified before the Commission in the power plant certification process, and interacted with federal and state agencies on the establishment of environmental limits for air and water pollutants.

1983-1985 California Department of Food and Agriculture: Environmental Health Specialist.

Evaluated pesticide registration data regarding the health and environmental effects of agricultural chemicals. Prepared reports for public information in connection with the eradication of specific agricultural pests in California.

DECLARATION OF
Dr.Obed Odoemelam

I, **Obed Odoemelam** declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting, Transmission, and Environmental Protection Division as a Staff Toxicologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transmission Line safety and Nuisance** for Henrietta Peaker Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/16/09 Signed: Odoemelam

At: Sacramento, California

MARIE McLEAN

QUALIFICATIONS SUMMARY

Twenty years experience in the field of environmental research, analysis, and planning, with specific emphasis on the economics of water, energy, and land use and its social, visual, and cultural ramifications. Specific projects involved (1) assessing economic costs and benefits of water delivery contracts and energy sales; (2) conducting and presenting visual analyses of historic and other local, state, and federal resources; (3) preparing local, state, and federal resource assessment forms; (4) determining and communicating benefits and costs of proposed development projects (housing, energy, and water) on the social and economic life of communities in which they are located; and (5) as member of local design review, historic preservation, and housing boards, recommended programs and policies and monitored their implementation.

RECENT PROFESSIONAL EXPERIENCE

California Energy Commission, Planner II, Environmental Office-Facilities Siting, January 2008—present.

Conduct technical analyses for complex facility siting cases and planning studies in the area of socioeconomics and visual resources.

Electricity Oversight Board; June 1, 2007—December 31, 2008.

Developed, conducted, and presented economic studies on energy markets and transmission projects; California Independent System Operator (CAISO) market redesign and technology upgrade program; and investigated, analyzed, and reported the effects of existing and proposed energy programs on supply, demand, and rates.

California Department of Water Resources, State Water Project Analysis Office, June 2001—July 31, 2007.

Developed and implemented complex analyses of the social, economic, and financial ramifications of contracted and proposed water deliveries and transfers and changes to valuation methods for selling energy in deregulated markets. Researched, identified, and reported on market activities in energy and water and their economic effects on ratepayers.

EDUCATION

Bachelor of Arts, Economics, California State University, Sacramento, 1983

DECLARATION OF
Marie McLean

I, Marie McLean, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Siting, Transmission, and Environmental Protection Division as an Environmental Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on Visual Resources for the Final Staff Assessment for the Henrietta Energy Peaker Project Amendment (01-18C-AFC) based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: July 28, 2009 Signed: Marie McLean

At: Sacramento, California

Ellen Townsend-Hough

SUMMARY

I am a chemical engineer with 29 years of experience. My strengths are in analyzing and performing complex environmental engineering analyses, in areas such as Waste Management, Hazardous Materials Management, Worker Safety, and Water Resources. I perform inspections work involved in the design and construction of thermal electrical generating power plants. I have a working knowledge of the California Environmental Quality Act. I worked as a policy advisor to a California Energy Commissioner for three years. I am also an US Environmental Protection Agency Environmental Justice trainer.

PROFESSIONAL EXPERIENCE

Technical Analysis and Presentation

- Performs mechanical engineering analysis of designs for complex mechanical engineering analysis of designs for systems such as combustion chambers and steam boilers, turbine generators, heat transfer systems, air quality abatement systems, cooling water tower systems, pumps and control systems

- Provide an engineering analysis examining the likelihood of compliance with the design criteria for power plants and also examine site specific potential significant adverse environmental impacts

- Review and analyze compliance submittals in accordance with the California Environmental Quality Act, the Warren Alquist Act, the Federal Clean Air Act and the California and Federal Occupational Health and Safety Acts to assure compliance of projects

- Provides licensing recommendations and function as an expert witness in regulatory hearings.

- Provide public health impact analysis to assess the potential for impacts associated with project related air toxic/non-criteria pollutant emissions.

- Evaluate the potential of public exposure to pollutant emissions during routine operation and during incidents due to accidents or control equipment failure

Technical Skills

- Establish mitigation that reduces the potential for human exposure to levels which would not result in significant health impact or health risk in any segment of the exposed population.

- Assist with on-site audits and inspection to assure compliance with Commission decisions.

- Review and evaluate the pollution control technology applied to thermal power plants and other industrial energy conversion technologies.

- Work with the following software applications: WORD, Excel, and PowerPoint.

Policy Advisor

- Provided policy, administrative and technical advice to the Commissioner Robert Pernell. My work with the Commissioner focused on the policy and environmental issues related to the Commission's power plant licensing, research and development and export programs.

- Track and provide research on varied California Energy Commission (CEC) programs. Prepare analysis of economic, environmental and public health impacts of programs, proposals and other Commission business items.

- Represent Commissioner's position in policy arenas and power plant siting discussions.

- Write and review comments articulating commission positions before other regulatory bodies including Air Resources Board, California Public Utilities Commission, and the Coastal Commission.

- Wrote speeches for the Commissioner's presentations.

Writing

- Write letters, memos, negative declarations, environmental impact reports that require technical evaluation of mechanical engineering and environmental aspects of pollution control systems, environmental impacts, public health issues and worker safety.

EMPLOYMENT HISTORY

2002-Present	Associate Mechanical Engineer	California Energy Commission (CEC) Sacramento CA
1999-2002	Advisor to CEC Commissioner	CEC Sacramento CA
1989-1999	Associate Mechanical Engineer	CEC Sacramento CA
1992-1993	Managing Partner	EnvironNet Sacramento CA
1988-1989	Sales Engineering Representative	Honeywell Inc Commerce CA
`1987-1988	Chemical Engineer	Groundwater Technology Torrance CA
1985-1986	Technical Marketing Engineer	Personal Computer Engineers Los Angeles CA
1985-1985	Energy Systems Engineer	Southern California Gas Company Anaheim CA
1980-1985	Design Engineer	Southern California Edison Rosemead CA
1975-1980	Student Chemical Engineer	Gulf Oil Company Pittsburgh PA

EDUCATION

Bachelor of Science, Chemical Engineering
Drexel University, Philadelphia Pennsylvania

Continuing Education

Hazardous Material Management Certificate, University California Davis
Urban Redevelopment and Environmental Law, University of California Berkley
Analytical Skills, California Department of Personnel Administration (DPA) Training Center
Legislative Process/Bill Analysis, DPA Training Center
Federally Certified Environmental Justice Trainer

References furnished upon request.

DECLARATION OF
Ellen Townsend-Hough

I, **Ellen Townsend-Hough** declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Siting Office of the Siting Transmission& Environmental Protection Division as an Associate Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Waste Management for the GWF Henrietta Combined-Cycle Power Plant based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 18, 2009 Signed: Ellen Townsend-Hough

At: Sacramento, California

STEVE BAKER, P.E.
Senior Mechanical Engineer

Experience Summary

Thirty-five years experience in the electric power generation field, including mechanical design, QA/QC, construction/startup and business development/licensing of nuclear, coal-fired, hydroelectric, geothermal and windpower plants; and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Long Beach--Master of Business Administration
- California State Polytechnic University, Pomona--Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California —
  No. M27737 expires 6/30/2010

Professional Experience

1990 to Present--Senior Mechanical Engineer, Facilities Siting Division - California Energy Commission

Technical lead person for the analysis of generating capacity, reliability, efficiency, noise, geology, paleontology and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases. Key contributor to Commission's investigation into market impediments to the deployment of advanced high-efficiency generating technologies.

1987 to 1990--Generation Systems/Facility Design Unit Supervisor, Siting & Environmental Division - California Energy Commission

Responsible for supervising the analysis of generating capacity, reliability, efficiency, safety, and mechanical, civil/structural, and geotechnical engineering aspects of power plant siting cases.

1981-1986--Operations Manager, Alternate Energy - Santa Fe Pacific Realty Corporation

Participated in and supervised identification, evaluation and feasibility analysis, licensing and permitting of hydroelectric, geothermal, windpower and biomass power projects.

1974-1981--Mechanical Engineer, Quality Engineer - Bechtel Power Corporation and Bechtel National, Inc.

Wrote equipment specifications, drew flow diagrams and P&ID's, performed system design and safety analysis for nuclear power plants and nuclear fuel processing plant. Wrote and implemented QA/QC procedures for nuclear power plant. Participated in construction/startup of large coal-fired power plant.

DECLARATION OF
Steve Baker

I, Steve Baker, declare as follows:

1. I am presently employed by the California Energy Commission in the Engineering Office of the Siting, Transmission and Environmental Protection Division as a Senior Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Facility Design**, and supervised preparation of the staff testimony on **Power Plant Efficiency, Power Plant Reliability, Noise and Vibration** and **Geology and Paleontology**, for the Henrietta Combined-Cycle Power Plant Conversion Amendment based on my independent analysis of the Petition for Amendment and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 30, 2009 Signed: Steve Baker

At: Sacramento, California

Robert D. Hunter, Ph.D., C.E.G.
Engineering Geologist
Vice President

Education

- Ph.D. – Geology – 1989 – University of Nevada, Reno
- M.S. – Geology – 1976 – University of California - Riverside
- B.S. – Earth Science – 1972 – California State University, Fullerton

Registrations

- Professional Geological Engineer – Nevada
- Registered Geologist – California
- Certified Engineering Geologist – California

Experience

1997 to Present: Black Eagle Consulting, Inc.; Vice President. Dr. Hunter is in charge of all phases of geochemical, geological, and geotechnical projects and is responsible for conducting, coordinating, and supervising geotechnical investigations for public and private sector clients. He is very familiar with design specifications and state and federal requirements.

Dr. Hunter has also provided geological, geotechnical, and paleontological review and written and oral testimony for California Energy Commission (CEC) power plant projects including:

- El Segundo Power Redevelopment Project (Coastal, including testimony and compliance monitoring)
- Magnolia Power Project (including compliance monitoring
- Ocotillo Energy Project (Wind Turbines)
- Vernon-Malburg Generating Station
- Inland Empire Energy Center (including testimony and compliance monitoring)
- Palomar Energy Project
- Henrietta Peaker Project
- East Altamont Energy Center
- Avenal Energy Center
- Teayawa Energy Center monitoring
- Walnut Energy Center (including compliance monitoring
- Riverside Energy Resource Center
- Salton Sea Unit 6 (Geothermal Turbines)
- National Modoc Power Plant
- Pastoria Energy Center
- Sun Valley Energy Project
- El Centro Unit 3 Repower Project
- AES Highgrove Project
- South Bay Replacement Project
- Vernon Power Plant

- Humboldt Bay Repowering Project
- Victorville Power Project
- Carlsbad Energy Center
- San Gabriel Generating Station
- Orange Grove
- Chula Vista Energy Upgrade
- Carrizo (Solar)
- Kings River
- Canyon Power Plant
- Otay Mesa Generating Project (compliance monitoring)
- Montainview Power Plant Project (compliance monitoring)
- Consumes Power Plant (compliance monitoring)
- Sunrise Power Project (compliance monitoring)
- Niland Power Project (compliance monitoring)
- Panoche Power Plant (compliance monitoring)

Attended Expert Witness Training Sponsored by CEC.

1978 to 1997: SEA, Incorporated; Geotechnical Manager, Engineering Geologist. Dr. Hunter was in charge of all phases of geotechnical projects for SEA, including project coordination and supervision, field exploration, geotechnical analysis, slope stability analysis, soil mechanics, engineering geochemistry, mineral and aggregate evaluations, and report preparation. Numerous investigations were undertaken on military, commercial, industrial, airport, residential, and roadway projects. He worked on many geothermal power plants, providing expertise in foundations design, slope stability, seismic assessment, geothermal hazard evaluation, expansive clay, and settlement problems. Project types included high-rise structures, airports, warehouses, shopping centers, apartments, subdivisions, storage tanks, roadways, mineral and aggregate evaluations, slope stability analyses, and fault studies.

1977 to 1978: Fugro (Ertec) Incorporated Consulting Engineers and Geologists; Staff Engineering Geologist; Long Beach, California.

Affiliations

- Association of Engineering Geologists

Publications

- Hunter, 1988, *Lime Induced Heave in Sulfate Bearing Clay Soils*, Journal of Geotechnical Engineering, ASCE, Vol. 14, No. 2, pp. 150-167.

- Hunter, 1989, *Applications of Stable Isotope Geochemistry in Engineering Geology*: Proceedings of the 25th Annual Symposium on Engineering Geology and Geotechnical Engineering.

- Hunter, 1993, *Evaluation of Potential Settlement Problems Related to Salt Dissolution in Foundation Soils*: Proceedings of the 29th Annual Symposium on Engineering Geology and Geotechnical Engineering.

DECLARATION OF
Dal Hunter, Ph.D., C.E.G.

I, **Dal Hunter**, declare as follows:

1. I am presently employed as a subcontractor to Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as an engineering geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Geology and Paleontology**, for the Henrietta Combined-Cycle Power Plant Conversion Amendment based on my independent analysis of the Petition for Amendment and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: September 16, 2009 Signed: _____

At: Reno, Nevada

REGISTERED GEOLOGIST
ROBERT DALTON HUNTER
No. 1411
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

exp. 3-31-11

Erin Bright
Mechanical Engineer

Experience Summary

One year of experience in the electric power generation field, including analysis of noise pollution, construction/licensing of electric generating power plants, and engineering and policy analysis of thermal power plant regulatory issues. One year of experience in the alternative energy field, including analysis of alternative fuel production and use.

Education

- University of California, Davis--Bachelor of Science, Mechanical Engineering and Materials Science
- University of California, Davis Extension Program--Renewable Energy Systems

Professional Experience

2007 to Present-- Mechanical Engineer, Energy Facilities Siting Division - California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

2006 to 2007--Energy Analyst, Fuels & Transportation Division - California Energy Commission

Performed analysis of use potential and environmental effects of emerging non-petroleum fuels, including compressed natural gas, biomass, hydrogen and electricity, in heavy and light duty transportation vehicles. Contributor to Energy Commission's alternative fuels plan.

DECLARATION OF
Erin Bright

I, Erin Bright, declare as follows:

1. I am presently employed by the California Energy Commission in the Engineering Office of the Siting, Transmission and Environmental Protection Division as a Senior Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Power Plant Efficiency** and **Power Plant Reliability** for the Henrietta Combined-Cycle Power Plant Conversion Amendment based on my independent analysis of the Petition for Amendment and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/14/09 Signed: _____

At: Sacramento, California

Sudath Arachchige
1916 Ackleton Way
Roseville CA 95661-USA Phone 916-786-6468

EDUCATION:

Bachelor of Science in Electrical Engineering at California State University Fullerton

ATTAINMENTS:

Member of the Professional Engineers in California Government
Vice President Electrical Engineering Society-California State University Fullerton.

EXPERIENCE:

November-2001 to Present: - Associate Electrical Engineer, System Assessment and Facilities Siting Division, California Energy Commission.

Conduct and perform planning studies and contingency analysis including power flow, short-circuit, stability, and post-transient analysis to maintain reliable operation of the power system. Investigates and analyzes Grid Planning problems and provides appropriate information to Grid Planning Engineers. Develops automated computer programs and other advance analysis methods for comprehensive evaluation of the operational performance of the transmission system.

Understanding of regulatory and reliability guidelines, WECC and NERC planning and operation criteria, CPUC and FERC requirements. Review technical analyses for WECC/ISO/PTO transmission systems and proposed system additions; provide support and analyses associated with Reliability Must-Run (RMR) contracts and the Local Area Reliability Services (LARS) process; review new generation interconnection studies; provide congestion analyses; and provide support for regulatory filings.

June-1998 to November-2001: - Project Electrical Engineer, Design Electrical Engineering Section, Department of Transportation, California.

Electrical Engineering knowledge and skills in the design, construction and maintenance of California state work projects involving all the public work areas; contract administration, construction management, plan checking, field engineering and provide liaison with consultants, developers, and contractors. Plan review in facility constructions, highway lighting, sign lighting, rest area lighting, preparation of project reports, cooperative agreements, review plans for compliance of construction and design guide lines for national electrical code, standards and ordinance. Review process included breaker relay coordination, detail wiring diagrams, layout details, service coordination, load, conductor sizes, derated ampacity, voltage drop calculations, harmonic and flicker determination.

June-1993 to May-1998:- Substation Electrical Engineer, City of Anaheim, California.

Performed protective relay system application, design and setting determination in Transmission & Distribution Substation. Understanding of principles of selective coordination system protection and controls for Electric Utility Equipment. Understanding of Power theory and Analysis of symmetrical components. Ability to review engineering plans, specifications, estimates and computation for Electrical Utility Projects. Practices of Electrical Engineering design, to include application of Electro-mechanical and solid state relays in Electrical Power Systems. Software skills in RNPDC (Fuse Coordination Program), Capacitor bank allocation program, and Load Flow Program. Design projects using CAD, Excel spread sheets including cost estimates, wiring diagrams, material specifications and field coordination.

Performed underground service design 12kV and 4kV duct banks; pole riser; getaway upgrade; voltage drop calculation, ampacity calculation and wiring diagrams. Design and maintence of substations in City Electrical Utility System. Upgrade Station Light and power transformers; upgrade capacitor banks; replacement of 12kV-4kV power circuits; Breakers at Metal Clad Switchgear. Design one-line diagrams; three line diagrams; grounding circuits; schematics; coordination of relay settings; conduit and material list preparation. Calculation of derated ampacity; inrush current, short circuit current and fault current.

DECLARATION OF
Sudath E. Arachchige

I, Sudath E. Arachchige, declare as follows:

1. I am presently employed by the California Energy Commission in the Engineering Office of the Siting, Transmission and Environmental Protection Division as a Associate Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Transmission System Engineering**, for the Henrietta Combined-Cycle Power Plant Conversion Amendment based on my independent analysis of the Petition for Amendment and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 10/30/09 Signed: Sudath E. Arachchige

At: Sacramento, California

Mark Hesters
Associate Electrical Engineer

Mark Hesters has sixteen years of experience in electric power regulation. He worked in the Engineering Office of the California Energy Commission's Energy Facilities Siting & Environmental Protection Division since 1998 providing analysis of California transmission systems and testimony on transmission systems in several Commission power plant certification processes. Prior to that Mark worked in the CEC's Electricity Analysis Office providing lead analysis on Southern California Edison resource issues and modeling support for all areas of California. He holds a B.S. degree from the University of California at Davis in Environmental Policy Analysis and Planning.

DECLARATION OF
Mark Hesters

I, **Mark Hesters** declare as follows:

1. I am presently employed by the California Energy Commission in the **Strategic Transmission Planning Office** of the Siting, Transmission and Environmental Protection Division as a **Senior Electrical Engineer**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transmission System Engineering**, for the **Henrietta Peaker Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/22/07 Signed: _____

At: Sacramento, California